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GAGE & SUPPLY
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PITTSBURGH GAGE AND SUPPLY COMPANY

MANUFACTURING JOBBERS

MILL, MINE, MACHINISTS
AND RAILROAD
SUPPLIES

MANUFACTURERS OF

Engineering and Electrical Specialties



Office, Warehouses and Shops, 30th Street and Liberty Avenue

PITTSBURGH, PENNA., U. S. A.

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O. W. RUSSELL
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CHICAGO ILL.

STANDARD STEAM,
GAS AND WATER
PIPEBLACK AND
GALVANIZED

FIG. 1

List adopted January 1, 1915

Nominal Size Inches	Price Black or Galvanized Per Foot	Nominal External Diameter Inches	Nominal Internal Diameter Inches	Nominal Thickness Inches	Nominal Weight Per Foot, Pounds		No. of Threads per Inch of Screw
					Plain Ends	Threads and Couplings	
1/8	.05 1/2	.405	.269	.068	.244	.245	27
1/4	.06	.540	.364	.088	.424	.425	18
3/8	.06	.675	.493	.091	.567	.568	18
1/2	.08 1/2	.840	.622	.109	.850	.852	14
3/4	.11 1/2	1.050	.824	.113	1.130	1.134	14
1	.17	1.315	1.049	.133	1.678	1.684	11 1/2
1 1/4	.23	1.660	1.330	.140	2.272	2.281	11 1/2
1 1/2	.27 1/2	1.900	1.610	.145	2.717	2.731	11 1/2
2	.37	2.375	2.067	.154	3.652	3.678	11 1/2
2 1/2	.58 1/2	2.875	2.469	.203	5.793	5.819	8
3	.76 1/2	3.500	3.068	.216	7.575	7.616	8
3 1/2	.92	4.000	3.548	.226	9.109	9.202	8
4	1.09	4.500	4.026	.237	10.790	10.889	8
4 1/2	1.27	5.000	4.506	.247	12.538	12.642	8
5	1.48	5.563	5.047	.258	14.617	14.810	8
6	1.92	6.625	6.065	.280	18.974	19.185	8
7	2.38	7.625	7.023	.301	23.544	23.769	8
8	2.50	8.625	8.071	.327	24.696	25.000	8
8	2.88	8.625	7.981	.322	28.554	28.809	8
9	3.45	9.625	8.941	.342	33.907	34.188	8
10	3.20	10.750	10.192	.379	31.201	32.000	8
10	3.50	10.750	10.136	.307	34.240	35.000	8
10	4.12	10.750	10.020	.365	40.483	41.132	8
11	4.63	11.750	11.000	.375	45.557	46.247	8
12	4.50	12.750	12.090	.330	43.773	45.000	8
12	5.07	12.750	12.000	.375	49.562	50.706	8
13	5.60	14.000	13.250	.375	54.568	55.824	8
14	6.10	15.000	14.250	.375	58.573	60.375	8
15	6.50	16.000	15.250	.375	62.579	64.500	8

Usual variation of weight 5 per cent.

Unless otherwise ordered, random lengths, with threads and couplings will be shipped.

For cut lengths, an extra charge will be made above random lengths.

For pipe smoothed on the inside, known as reamed and drifted, an extra charge will be made above standard pipe.

For galvanized or coated pipe, an extra charge will be made above black.

EXTRA STRONG STEAM, GAS AND WATER PIPE

Card Weight—Subject to the Usual Variation of 5 Per Cent.
Manufacturers List Adopted Jan. 1, 1913.

Size, Inches	Nominal Outside Diameter, Inches	Nominal Inside Diameter, Inches	Nominal Thickness, Inch	Nominal Weight per Foot, Pounds	Price per Foot
$\frac{1}{8}$	.405	.215	.095	.314	\$0.12
$\frac{1}{4}$	.540	.302	.119	.535	.07 $\frac{1}{2}$
$\frac{3}{8}$	.675	.423	.126	.738	.07 $\frac{1}{2}$
$\frac{1}{2}$	.840	.546	.147	1.087	.11
$\frac{3}{4}$	1.050	.742	.154	1.473	.15
1	1.315	.957	.179	2.171	.22
1 $\frac{1}{4}$	1.660	1.278	.191	2.996	.30
1 $\frac{1}{2}$	1.900	1.500	.200	3.631	.36 $\frac{1}{2}$
2	2.375	1.939	.218	5.022	.50 $\frac{1}{2}$
2 $\frac{1}{2}$	2.875	2.323	.276	7.661	.77
3	3.500	2.900	.300	10.252	1.03
3 $\frac{1}{2}$	4.000	3.364	.318	12.505	1.25
4	4.500	3.826	.337	14.983	1.50
4 $\frac{1}{2}$	5.000	4.290	.355	17.611	1.80
5	5.563	4.813	.375	20.778	2.08
6	6.625	5.761	.432	28.573	2.86
7	7.625	6.625	.500	38.048	3.81
8	8.625	7.625	.500	43.388	4.34
9	9.625	8.625	.500	48.728	4.90
10	10.750	9.750	.500	54.735	5.48
11	11.750	10.750	.500	60.075	6.10
12	12.750	11.750	.500	65.415	6.55

DOUBLE EXTRA STRONG PIPE

Card Weight—Subject to the Usual Variation of 10 Per Cent.

Size, Inches	Nominal Outside Diameter, Inches	Nominal Inside Diameter, Inches	Thickness, Inch	Nominal Weight per Foot, Pounds	Price per Foot
$\frac{1}{2}$	.840	.252	.294	1.714	\$0.32
$\frac{3}{4}$	1.050	.434	.308	2.440	.35
1	1.315	.599	.358	3.659	.37
1 $\frac{1}{4}$	1.660	.896	.382	5.214	.52 $\frac{1}{2}$
1 $\frac{1}{2}$	1.900	1.100	.400	6.408	.65
2	2.375	1.503	.436	9.029	.91
2 $\frac{1}{2}$	2.875	1.771	.552	13.695	1.37
3	3.500	2.300	.600	18.583	1.86
3 $\frac{1}{2}$	4.000	2.728	.636	22.850	2.30
4	4.500	3.152	.674	27.541	2.76
4 $\frac{1}{2}$	5.000	3.580	.710	32.530	3.26
5	5.563	4.063	.750	38.552	3.86
6	6.625	4.897	.864	53.160	5.32
7	7.625	5.875	.875	63.079	6.35
8	8.625	6.875	.875	72.424	7.25

Extra Strong and Double Extra Strong Pipe will be shipped in random lengths and plain ends unless otherwise ordered.

Random Length Double Extra Strong Pipe is considered to be 12 feet to 20 feet, we to have the privilege, however, of supplying not exceeding 5 per cent of total order in lengths from 6 feet to 12 feet.

For pipe fitted with threads and couplings, for cut lengths, and for galvanized or asphalted pipe, an extra charge will be made above regular.

LARGE O. D. PIPE



FIG. 2

PLAIN ENDS

Manufacturers List Adopted Jan. 1, 1913.

PRICE, PER LINEAL FOOT

Size O. D.	$\frac{1}{4}$ Inch Thick	$\frac{5}{16}$ Inch Thick	$\frac{3}{8}$ Inch Thick	$\frac{7}{16}$ Inch Thick	$\frac{1}{2}$ Inch Thick	$\frac{5}{8}$ Inch Thick	$\frac{3}{4}$ Inch Thick	$\frac{7}{8}$ Inch Thick	1 Inch Thick
14	\$3.68	\$4.57	\$5.46	\$6.34	\$7.21	\$8.08	\$8.93	\$10.62	\$13.89
15	3.94	4.91	5.86	6.81	7.75	8.68	9.60	11.42	14.96
16	4.21	5.24	6.26	7.28	8.28	9.28	10.27	12.22	16.03
17	4.48	5.57	6.66	7.74	8.82	9.88	10.94	13.02	17.09
18	4.74	5.91	7.06	8.21	9.35	10.48	11.60	13.82	18.16
20	.....	6.58	7.86	9.15	10.42	11.68	12.94	15.42	20.30
21	.....	6.91	8.27	9.61	10.95	12.28	13.61	16.23	.....
22	.....	7.24	8.67	10.08	11.49	12.88	14.27	17.03	.....
24	.....	.....	9.47	11.01	12.55	14.09	15.61	18.63	.....
26	.....	.....	10.27	11.95	13.62	15.29	16.94	20.23	.....
28	.....	.....	.....	12.88	14.69	16.49	18.28	21.83	.....
30	.....	.....	.....	13.82	15.76	17.69	19.61	23.43	.....

This pipe will be shipped in random lengths, plain ends, unless otherwise ordered.

For cut lengths an extra charge above random will be made.

For threaded pipe an extra charge above plain ends will be made.

We can thread up to 24-inch inclusive.

We can furnish wrought couplings for sizes up to 20-inch inclusive.

ESTIMATED WEIGHT

PER LINEAL FOOT

OF LARGE O. D. PIPE, PLAIN ENDS

Out-side Diam., In.	Weight per Foot, Pounds								
	$\frac{1}{4}$ Inch Thick	$\frac{5}{16}$ Inch Thick	$\frac{3}{8}$ Inch Thick	$\frac{7}{16}$ Inch Thick	$\frac{1}{2}$ Inch Thick	$\frac{5}{8}$ Inch Thick	$\frac{3}{4}$ Inch Thick	$\frac{3}{4}$ Inch Thick	1 Inch Thick
14	36.713	45.682	54.568	63.371	72.091	80.726	89.279	106.134	138.842
15	39.383	49.020	58.573	68.044	77.431	86.734	95.954	114.144	149.522
16	42.053	52.357	62.579	72.716	82.771	92.742	102.629	122.154	160.202
17	44.723	55.695	66.584	77.389	88.111	98.749	109.304	130.164	170.882
18	47.393	59.032	70.589	82.061	93.451	104.757	115.979	138.174	181.562
20	.....	65.708	78.599	91.407	104.131	116.772	129.330	154.194	202.923
21	.....	69.045	82.604	96.079	109.471	122.780	136.005	162.204	.....
22	.....	72.383	86.609	100.752	114.811	128.787	142.680	170.215	.....
24	.....	.....	94.619	110.097	125.491	140.802	156.030	186.235	.....
26	.....	.....	102.629	119.442	136.172	152.818	169.380	202.255	.....
28	.....	.....	.....	128.787	146.852	164.833	182.730	218.275	.....
30	.....	.....	.....	138.132	157.532	176.848	196.081	234.296	.....

The permissible variation in weight is 5 per cent above and 5 per cent below.

STANDARD BUNDLING SCHEDULE
MERCHANTS STEEL AND IRON PIPE
AVERAGE NUMBER OF FEET AND WEIGHT PER BUNDLE

Size	Standard Pipe			Extra Strong Pipe			Double Extra Strong Pipe		
	Pieces	Feet	Weight	Pieces	Feet	Weight	Pieces	Feet	Weight
$\frac{1}{8}$	..	500	123	..	500	157	..	...	...
$\frac{1}{4}$	24	420	179	24	400	214	..	...	...
$\frac{3}{8}$	18	340	193	18	330	244	..	...	...
$\frac{1}{2}$	12	240	204	12	230	250	7	130	223
$\frac{3}{4}$	7	140	159	7	140	206	5	95	232
1	5	100	168	5	100	217	3	60	220
$1\frac{1}{4}$	3	60	137	3	60	180	3	60	313
$1\frac{1}{2}$	3	60	164	3	60	218	3	60	384

STANDARD OIL WELL TUBING
ALL WEIGHTS AND DIMENSIONS ARE NOMINAL

Size	Diameters		Thick-ness	Weight per Foot		Thds. per Inch	Couplings		
	Ex-ternal	In-ternal		Plain Ends	Threads and Couplings		Dia-meter	Lgth.	Weight
$1\frac{1}{4}$	1.660	1.380	.140	2.272	2.300	$11\frac{1}{2}$	2.093	3	1.352
$1\frac{1}{2}$	1.909	1.610	.145	2.717	2.748	$11\frac{1}{2}$	2.343	3	1.549
2	2.375	2.041	.167	3.938	4.000	$11\frac{1}{2}$	2.875	$3\frac{3}{4}$	2.331
2	2.375	1.995	.190	4.433	4.500	$11\frac{1}{2}$	2.875	$3\frac{3}{4}$	2.331
$2\frac{1}{2}$	2.875	2.469	.203	5.793	5.897	$11\frac{1}{2}$	3.500	$4\frac{1}{2}$	2.331
$2\frac{1}{2}$	2.875	2.441	.217	6.160	6.250	$11\frac{1}{2}$	3.500	$4\frac{1}{2}$	4.000
3	3.500	3.068	.216	7.575	7.694	$11\frac{1}{2}$	4.156	$4\frac{1}{2}$	5.000
3	3.500	3.018	.241	8.388	8.500	$11\frac{1}{2}$	4.156	$4\frac{1}{2}$	5.000
3	3.500	2.922	.289	9.910	10.000	$11\frac{1}{2}$	4.156	$4\frac{1}{2}$	5.000
$3\frac{1}{2}$	4.000	3.548	.226	9.109	9.261	8	4.687	$4\frac{1}{2}$	6.120
4	4.500	4.026	.237	10.790	10.930	8	5.250	$4\frac{1}{2}$	7.344
4	4.500	3.990	.255	11.561	11.750	8	5.250	$4\frac{1}{2}$	7.344

Prices on application.

The permissible variation in weight is 5 per cent above and 5 per cent below.

Furnished with threads and couplings and in random lengths, unless otherwise ordered.

All weights given in pounds. All dimensions given in inches.

PIPE TRADE CUSTOMS

Quotations subject to change without notice. Sales subject to strikes, accidents or causes beyond our control.

Every piece of Pipe, Tubing, Casing, Boiler Tube, Line Pipe, etc., is carefully tested, but as it is impossible to always detect imperfections, the only guarantee that is given is to replace such goods as prove defective.

Under no circumstance are we responsible for any damages beyond the price of the goods. No charges for labor or expense required to repair defective goods or occasioned by them will be allowed. If the goods are defective, the measure of damages is the price of the defective pieces.

Claims for shortage or deductions for erroneous charges must be promptly presented or will not be allowed.

Screw and Socket Joint



FIG. 3

WROUGHT WELL CASING
ALL WEIGHTS AND DIMENSIONS
ARE NOMINAL

Inserted Joint



FIG. 4

Size	List Per Foot	Diameters		Thick- ness	Weight Per Foot		Threads per Inch	Inserted Joint	
		Ex- ternal	In- ternal		Plain Ends	Threads and Couplings		Length of Joint	Diameter of Joint
2	\$0.33	2.250	2.050	.100	2.296	2.34	14	.967	2.340
2 1/4	.33	2.500	2.284	.108	2.759	2.82	14	.992	2.606
2 1/2	.33	2.750	2.524	.113	3.182	3.25	14	1.017	2.866
2 3/4	.40	3.000	2.768	.116	3.572	3.65	14	1.042	3.122
3	.41	3.250	3.010	.120	4.011	4.10	14	1.067	3.380
3 1/4	.46	3.500	3.250	.125	4.505	4.60	14	1.092	3.640
3 1/2	.51	3.750	3.492	.129	4.988	5.10	14	1.117	3.898
3 3/4	.56 1/2	4.000	3.732	.134	5.532	5.65	14	1.142	4.158
4	.62	4.250	3.974	.138	6.060	6.20	14	1.167	4.416
4 1/4	.68 1/2	4.500	4.216	.142	6.609	6.75	14	1.192	4.674
4 1/2	.68 1/2	4.500	4.090	.205	9.403	9.50	14	.....	.....
4 3/4	.74	4.750	4.460	.145	7.131	7.25	14	1.217	4.930
4 1/2	.74	4.750	4.364	.193	9.393	9.50	14	.....	.....
4 3/4	.81	5.000	4.696	.152	7.870	8.00	14	1.242	5.194
5	.85	5.250	4.944	.153	8.328	8.50	14	1.267	5.446
5	.85	5.250	4.886	.182	9.851	10.00	14	.....	.....
5	.85	5.250	4.886	.182	9.851	10.00	11 1/2	.....	.....
5	.85	5.250	4.768	.241	12.892	13.00	11 1/2	.....	.....
5	.85	5.250	4.648	.301	15.909	16.00	11 1/2	.....	.....
5 1/8	.90	5.500	5.192	.154	8.792	9.00	14	1.292	5.698
5 1/8	.90	5.500	5.044	.228	12.837	13.00	11 1/2	.....	.....
5 1/8	.90	5.500	4.892	.304	16.870	17.00	11 1/2	.....	.....
5 1/8	1.05	6.000	5.672	.164	10.222	10.50	14	1.342	6.218
5 1/8	1.05	6.000	5.620	.190	11.789	12.00	11 1/2	.....	.....
5 1/8	1.05	6.000	5.552	.224	13.818	14.00	11 1/2	.....	.....
5 1/8	1.05	6.000	5.450	.275	16.814	17.00	11 1/2	.....	.....
6 1/4	1.20	6.625	6.287	.169	11.652	12.00	14	1.405	6.853
6 1/4	1.20	6.625	6.255	.185	12.724	13.00	14	.....	.....
6 1/4	1.20	6.625	6.257	.184	12.657	13.00	11 1/2	.....	.....
6 1/4	1.20	6.625	6.135	.245	16.694	17.00	11 1/2	.....	.....
6 1/4	1.20	6.625	5.913	.356	23.835	24.00	11 1/2	.....	.....
6 1/2	1.35	7.000	6.652	.174	12.685	13.00	14	1.442	7.238
6 1/2	1.35	7.000	6.538	.231	16.699	17.00	11 1/2	.....	.....
6 1/2	1.35	7.000	6.538	.231	16.699	17.00	10	.....	.....
6 1/2	1.35	7.000	6.450	.275	19.751	20.00	10	.....	.....
6 1/2	1.35	7.000	6.334	.333	23.711	24.00	10	.....	.....
7 1/4	1.48	7.625	7.263	.181	14.390	14.75	14	1.505	7.877
7 1/2	1.60	8.000	7.628	.186	15.522	16.00	11 1/2	1.573	8.238
7 1/2	1.60	8.000	7.528	.236	19.569	20.00	11 1/2	.....	.....
8 1/4	1.75	8.625	8.249	.188	16.940	17.50	11 1/2	1.636	8.867
8 1/4	1.75	8.625	8.191	.217	19.486	20.00	11 1/2	.....	.....
8 1/4	1.75	8.625	8.097	.264	23.574	24.00	11 1/2	.....	.....
8 1/4	1.75	8.625	8.097	.264	23.574	24.00	8	.....	.....
8 1/4	1.75	8.625	8.003	.311	27.615	28.00	8	.....	.....
8 3/8	1.90	9.000	8.608	.196	18.429	19.00	11 1/2	1.673	9.258
9 3/8	2.28	10.000	9.582	.209	21.855	22.75	11 1/2	1.773	10.284
9 3/8	2.28	10.000	9.434	.283	29.369	30.25	11 1/2	.....	.....
10	.....	10.750	10.192	.279	31.201	32.51	8	.....	.....
10	.....	10.750	10.146	.302	33.699	35.00	8	.....	.....
10 3/8	2.68	11.000	10.552	.224	25.780	26.75	11 1/2	1.873	11.314
11 3/8	3.15	12.000	11.514	.243	30.512	31.50	11 1/2	1.973	12.352

LINE AND DRIVE PIPE

Adopted January 1, 1913. All weights and dimensions are nominal.

The permissible variation in weight is 5 per cent above and 5 per cent below.

LINE AND DRIVE PIPE

Size, Inches	Diameter, In.		Thick- ness, Inches	Weight per Foot, Pounds			Threads per Inch	Price per Foot	
	External	Internal		Plain Ends	Threaded and C'pl'd Line Pipe	Threaded and C'pl'd Drive Pipe		Line Pipe	Drive Pipe
$\frac{1}{8}$	.405	.269	.068	.244	.246	.....	27	.06	*
$\frac{3}{16}$	.540	.364	.088	.424	.426	.....	18	.06 $\frac{1}{2}$	*
$\frac{3}{8}$	.675	.493	.091	.567	.571	.....	18	.06 $\frac{1}{2}$	*
$\frac{1}{2}$	.840	.622	.109	.850	.856	.....	14	.09	*
$\frac{3}{4}$	1.050	.824	.113	1.130	1.138	.....	14	.12	*
1	1.315	1.049	.133	1.678	1.688	.....	11 $\frac{1}{2}$	.17 $\frac{1}{2}$	*
1 $\frac{1}{4}$	1.660	1.380	.140	2.272	2.300	.....	11 $\frac{1}{2}$	.23 $\frac{1}{2}$	*
1 $\frac{1}{2}$	1.900	1.610	.145	2.717	2.748	.....	11 $\frac{1}{2}$	.28	*
2	2.375	2.067	.154	3.652	3.716	3.730	11 $\frac{1}{2}$	.37 $\frac{1}{2}$	.....
2 $\frac{1}{2}$	2.875	2.469	.203	5.793	5.881	5.906	8	.59	.....
3	3.500	3.068	.216	7.575	7.675	7.795	8	.77	.....
3 $\frac{1}{2}$	4.000	3.548	.226	9.109	9.261	9.294	8	.93	.....
4	4.500	4.026	.237	10.790	10.980	10.995	8	1.10	.....
4 $\frac{1}{2}$	5.000	4.506	.247	12.538	12.742	12.758	8	1.28	.....
5	5.563	5.047	.258	14.617	14.966	14.989	8	1.50	.....
6	6.625	6.065	.280	18.974	19.367	19.408	8	1.94	.....
7	7.625	7.023	.301	23.544	23.975	24.021	8	2.40	.....
8	8.625	8.071	.277	24.696	25.414	25.495	8	2.54	.....
8	8.625	7.981	.322	28.554	29.213	29.303	8	2.92	.....
8	8.625	7.917	.354	31.270	.....	32.334	8	* .....	.....
9	9.625	8.941	.342	33.907	34.612	34.711	8	3.47	.....
10	10.750	10.192	.279	31.201	32.515	32.631	8	3.25	.....
10	10.750	10.136	.307	34.240	35.504	35.628	8	3.55	.....
10	10.750	10.020	.365	40.483	41.644	41.785	8	4.17	.....
11	11.750	11.000	.375	45.557	46.805	46.953	8	4.68	.....
12	12.750	12.090	.330	43.773	45.217	45.358	8	4.55	.....
12	12.750	12.000	.375	49.562	50.916	51.067	8	5.12	.....
13	14.000	13.250	.375	54.568	56.649	56.849	8	5.68	.....
14	15.000	14.250	.375	58.573	60.802	61.005	8	6.18	.....
15	16.000	15.250	.375	62.579	64.955	65.161	8	6.60	.....
17OD	17.000	16.214	.393	69.704	.....	73.000	8	* .....	.....
18OD	18.000	17.182	.409	76.840	.....	81.000	8	* .....	.....
20OD	20.000	19.182	.409	85.577	.....	90.000	8	* .....	.....

*Not made. †An extra charge will be made for cut lengths or galvanized, or coated pipe. Furnished with threads and couplings and all random lengths, unless otherwise ordered.

2 INCH LINE PIPE (IRON OR STEEL)

WEIGHT, 3.61 LBS. PER FOOT

2-inch Gas Line Pipe.....	tested 1,200 lbs. (8 threads)
2-inch Line Pipe.....	tested 1,500 lbs. (8 threads)
2-inch Oil Line Pipe.....	tested 1,500 lbs. (8 threads)
2-inch Special Oil Line.....	tested 1,750 lbs. (8 threads)
(Selected uniform lengths plugged and reamed.)	

Random lengths Steel Pipe with threads and couplings will be shipped unless otherwise ordered.

For cut lengths or half random lengths an extra charge will be made.

For galvanized or asphalted an extra charge will be made above black.

PIPE FITTING SKETCH

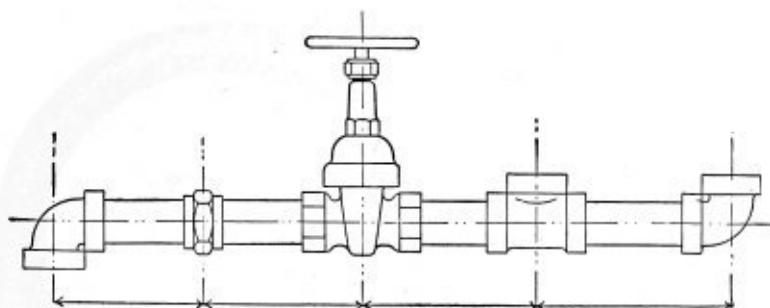


FIG. 5

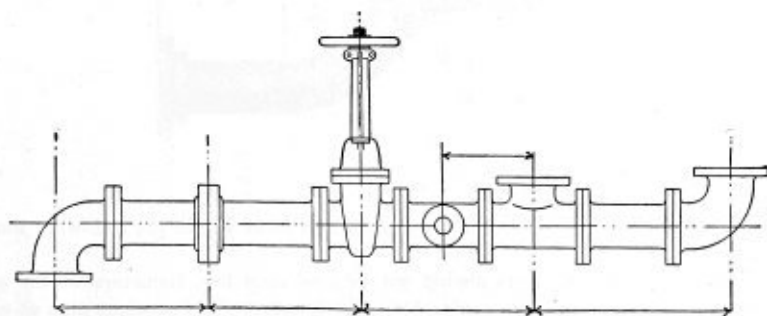


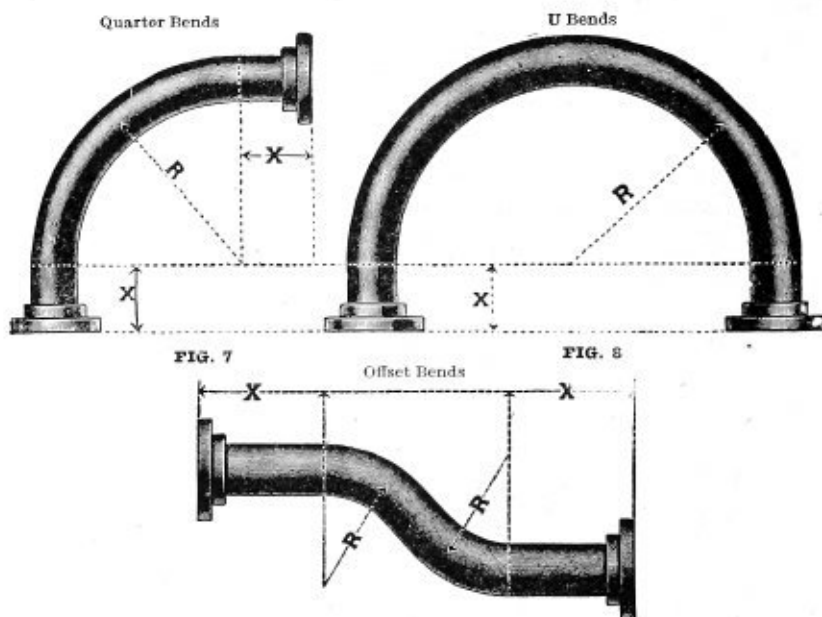
FIG. 6

We are equipped with the most improved facilities for cutting, threading and fitting all sizes of pipe to sketch.

In laying out work of this kind great care should be taken in making sketches. All measurements should be given center to center as shown in above diagrams. It is also necessary to know for what purpose the pipe is to be used and the pressure it is required to stand.

PIPE BENDS

MADE FROM WROUGHT IRON OR STEEL PIPE



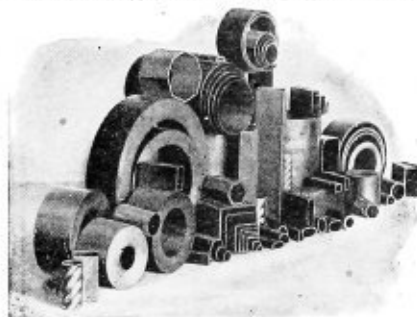
We can have large pipe bent in any desired form within the following limits:

The radius of any bend should not be less than five diameters of the pipe and a larger radius is much preferable. The length "X" of straight pipe at each end of bend should be not less than the following:

2½-in. Pipe	X = 4 in.	5-in. Pipe	X = 6 in.	12-in. Pipe	X = 14 in.
3-in. Pipe	X = 4 in.	6-in. Pipe	X = 7 in.	14-in. Pipe	X = 16 in.
3½-in. Pipe	X = 5 in.	7-in. Pipe	X = 8 in.	15-in. Pipe	X = 16 in.
4-in. Pipe	X = 5 in.	8-in. Pipe	X = 9 in.	16-in. Pipe	X = 20 in.
4½-in. Pipe	X = 6 in.	10-in. Pipe	X = 12 in.	18-in. Pipe	X = 22 in.

These bends can be made of extra heavy or full weight pipe according to order.

COLD DRAWN SEAMLESS STEEL TUBING



ROUND. PRICE LIST—PER FOOT

OUTSIDE DIAMETER IN INCHES

Thickness B. W. 12 to 60 11 and Fractions	Equivalent in Decimal of inch	ROUND, PRICE LIST—PER FOOT																			
		OUTSIDE DIAMETER IN INCHES																			
		$\frac{1}{16}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	$3\frac{3}{4}$	4
20	.035	09	11	14	16	18	21	23	25	28	31	35	38	41	46	50	58	67	76	85	93
18	.049	12	15	19	22	25	28	32	35	38	41	46	50	55	60	67	76	85	93	101	110
16	.065	15	20	24	28	33	37	41	46	50	55	60	67	74	81	89	98	107	118	129	140
14	.083	19	24	30	35	40	46	52	57	63	70	77	84	91	99	107	116	127	138	150	162
12	.095	22	27	33	40	46	52	59	65	71	78	84	91	99	107	116	127	138	150	162	175
10	.109	25	30	38	45	52	59	67	74	81	89	98	107	116	127	138	150	162	175	188	201
8	.134	30	36	44	53	62	71	80	89	98	107	116	127	138	150	162	175	188	201	215	229
6	.156	35	42	50	60	71	81	91	102	112	123	133	144	155	166	177	188	201	215	229	243
5	.188	40	48	57	69	82	94	107	119	132	145	157	170	182	195	207	220	233	246	260	273
4	.219	45	54	64	77	91	106	121	135	150	167	179	198	208	227	236	256	266	285	296	315
3	.250	50	60	71	84	100	117	134	150	167	182	200	234	267	300	334	367	400	434	467	500
2	.312	60	72	85	100	117	134	150	167	182	200	234	267	300	334	367	400	434	467	500	533
1 1/2	.375	70	84	100	117	134	150	167	182	200	234	267	300	334	367	400	434	467	500	533	566
1	.450	80	96	114	134	150	167	182	200	234	267	300	334	367	400	434	467	500	533	566	600
3/4	.500	90	108	128	150	167	182	200	234	267	300	334	367	400	434	467	500	533	566	600	633
5/8	.562	100	120	142	166	182	200	234	267	300	334	367	400	434	467	500	533	566	600	633	666
1/2	.625	110	132	156	182	200	234	267	300	334	367	400	434	467	500	533	566	600	633	666	700
3/8	.750	120	144	170	200	234	267	300	334	367	400	434	467	500	533	566	600	633	666	700	733
1/4	.875	130	156	184	216	250	283	317	350	383	417	450	483	517	550	583	617	650	683	717	750
1/8	1.000	140	168	200	234	267	300	334	367	400	434	467	500	533	566	600	633	666	700	733	766

The above prices are quoted at a base discount subject to the following extras:

Thickness B. W. G. and Fractions	Equivalent in Decimal of inch	1/2	3/8	1/2	3/4	1	1 1/8	1 1/4	1 3/8	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4
20	.035	50	45	40	35	31	27	25	25	25	x	x	x	x	x
18	.049	45	38	35	31	27	22	20	19	18	x	x	x	x	x
16	.065	41	34	31	27	25	20	17	15	14	13	12	11	11	11
14	.083	35	29	25	23	21	18	15	12	10	9	7	6	5	5
13	.095	31	27	23	20	18	16	13	10	8	7	4	3	2	2
12	.109	30	25	21	18	16	14	11	8	6	5	2	1	.....	.....
11	.120	28	24	20	17	15	13	9	7	5	3	.....	.....	.....	.....
10	.134	x	23	18	16	14	12	8	6	4	2	.....	.....	.....	.....
9	.156	x	x	17	15	13	10	7	5	3	1	.....	.....	.....	.....
8	.188	x	x	15	13	11	9	6	4	2	.....	.....	.....	.....	.....
7	.218	x	x	x	11	9	7	4	2	1	.....	.....	.....	.....	.....
6	.250	x	x	x	x	8	6	3	1	.....	.....	.....	.....	.....	.....
5	.312	x	x	x	x	x	x	2	.....	.....	.....	.....	.....	.....	.....
4	.375	x	x	x	x	x	x	1	.....	.....	.....	.....	.....	.....	.....

To arrive at the net discount on sizes given on this sheet, lower the base discount by the number of points indicated for each size and gauge.

Example— $\frac{1}{4}$ x 20 gauge, lower base discount by 50 points.

STANDARD BOILER TUBES



FIG. 10

List February 1, 1916.

STEEL AND CHARCOAL IRON

External Diameter Inches	Standard Thickness, Minimum		PRICE PER FOOT				
	Birming- ham Wire Gauge	Inches	Standard Thick- ness	One Extra Wire Gauge	Two Extra Wire Gauges	Three Extra Wire Gauges	Four Extra Wire Gauges
1¾	13	.095	\$.22	\$.26	\$.28	\$.31	\$.34
2	13	.095	.21	.24	.26	.28	.31
2¼	13	.095	.24	.27	.29	.32	.35
2½	12	.109	.30	.32	.36	.39	.43
2¾	12	.109	.34	.37	.40	.44	.48
3	12	.109	.38	.41	.45	.49	.54
3¼	11	.120	.45	.49	.53	.59	.63
3½	11	.120	.48	.53	.58	.64	.69
3¾	11	.120	.52	.57	.62	.68	.74
4	10	.134	.61	.66	.73	.79	.88
4½	10	.134	.69	.75	.83	.89	.99
5	9	.148	.81	.90	.97	1.08	1.17
6	8	.165	1.08	1.17	1.31	1.41	1.52
7	8	.165	1.27	1.38	1.54	1.66	1.78
8	8	.165	1.45	1.58	1.76	1.90	2.05
9	7	.180	1.78	1.99	2.15	2.31	2.50
10	6	.203	2.22	2.39	2.57	2.79	3.04
11	5	.220	2.63	2.84	3.07	3.35	3.53
12	..	.229	2.99	3.23	3.51	3.76	4.10
13	4	.238	3.36	3.64	3.98	4.19	4.72

Tubes more than four gauges heavier than Standard will be charged per pound.

WEIGHTS STANDARD AND EXTRA GAUGE BOILER TUBES

January 1st, 1916

1¾	13	.095	1.84	2.07	2.24	2.46	2.68
2	13	.095	2.10	2.37	2.57	2.83	3.09
2¼	13	.095	2.38	2.68	2.92	3.21	3.50
2½	12	.109	3.00	3.26	3.59	3.92	4.32
2¾	12	.109	3.37	3.66	4.02	4.39	4.83
3	12	.109	3.74	4.07	4.47	4.88	5.36
3¼	11	.120	4.45	4.90	5.34	5.87	6.33
3½	11	.120	4.81	5.29	5.77	6.34	6.84
3¾	11	.120	5.17	5.69	6.20	6.82	7.36
4	10	.134	6.08	6.64	7.30	7.88	8.76
4½	10	.134	6.87	7.50	8.26	8.92	9.92
5	9	.148	8.12	8.96	9.71	10.8	11.6
6	8	.165	10.8	11.7	13.1	14.1	15.1
7	8	.165	12.6	13.7	15.3	16.5	17.8
8	8	.165	14.5	15.7	17.6	19.0	20.4
9	7	.180	17.7	19.8	21.4	23.0	24.9
10	6	.203	22.1	23.8	25.7	27.8	30.3
11	5	.220	26.3	28.3	30.7	33.5	35.2
12	..	.229	29.8	32.2	35.1	37.6	41.0
13	4	.238	33.6	36.4	39.7	41.8	47.1

SEAMLESS BOILER TUBE FERRULES

Plain Ferrule



FIG. 11

Flanged Ferrule



FIG. 12

PRICE LIST PER HUNDRED OF PURE SHEET COPPER SEAMLESS
BOILER TUBE FERRULES WITH OR WITHOUT FLANGE

ADOPTED JULY 1ST, 1912

Inside Diameter, Inches	Width, Inches	Thickness of Copper, Inches						
		$\frac{1}{32}$	$\frac{3}{64}$	$\frac{1}{16}$	$\frac{5}{64}$	$\frac{3}{32}$	$\frac{7}{64}$	$\frac{1}{8}$
1	$\frac{1}{2}$	\$5.10	\$7.50	\$9.50	\$11.75	\$13.50	\$15.50	\$16.50
	$\frac{5}{8}$	6.30	9.30	11.75	14.50	16.50	19.00	20.00
1 $\frac{1}{4}$	$\frac{1}{2}$	6.30	9.30	11.75	14.50	16.50	19.00	20.00
	$\frac{5}{8}$	7.80	11.60	14.50	18.25	20.50	23.50	24.75
1 $\frac{1}{2}$	$\frac{1}{2}$	7.50	11.40	14.00	17.75	19.50	23.00	24.00
	$\frac{5}{8}$	9.30	14.20	17.00	21.75	25.00	28.50	29.75
1 $\frac{3}{4}$	$\frac{1}{2}$	8.70	13.20	16.25	20.50	22.50	26.00	27.25
	$\frac{5}{8}$	10.80	16.40	20.25	25.50	28.50	33.00	34.75
	$\frac{3}{4}$	12.90	19.60	24.25	30.50	34.50	40.00	42.00
	$\frac{1}{2}$	9.30	14.20	17.00	21.75	25.00	28.50	30.00
1 $\frac{7}{8}$	$\frac{5}{8}$	11.60	17.70	21.50	27.00	31.00	35.50	37.50
	$\frac{3}{4}$	13.90	21.20	26.00	32.25	37.00	42.50	44.75
	$\frac{7}{8}$	16.20	24.70	30.50	37.50	43.00	49.50	52.25
	1	18.50	28.20	35.00	42.75	49.00	56.50	59.50
2	$\frac{1}{2}$	9.80	14.90	18.25	23.00	25.50	30.00	31.50
	$\frac{5}{8}$	12.30	18.60	23.00	28.75	32.00	37.50	39.50
	$\frac{3}{4}$	14.80	22.30	27.75	34.50	38.50	45.00	47.50
	$\frac{7}{8}$	17.30	26.00	32.50	40.25	45.00	52.50	55.25
2 $\frac{1}{4}$	1	19.80	29.70	37.25	46.00	51.50	60.00	63.25
	$\frac{5}{8}$	13.50	20.40	25.25	31.75	36.00	41.50	43.50
	$\frac{3}{4}$	16.30	24.60	30.50	38.25	43.00	50.00	52.50
	$\frac{7}{8}$	19.10	28.80	35.75	44.75	50.00	58.50	61.50
2 $\frac{1}{2}$	1	21.90	33.00	41.00	51.25	57.00	67.00	70.50
	$\frac{5}{8}$	15.00	22.80	28.25	35.75	39.50	46.50	49.00
	$\frac{3}{4}$	18.10	27.40	34.00	42.75	47.50	55.50	58.50
	$\frac{7}{8}$	21.20	32.00	39.75	49.75	55.50	64.50	68.00
3	1	24.30	36.60	45.50	56.75	63.50	73.50	77.50
	$\frac{3}{4}$	21.90	33.00	41.00	51.00	57.00	66.50	70.00
	$\frac{5}{8}$	25.50	38.40	47.75	59.50	66.50	77.50	81.50
	1	29.10	43.80	54.50	68.00	76.00	88.50	93.25
3 $\frac{1}{4}$	$\frac{3}{4}$	23.70	35.70	44.25	55.50	62.00	72.00	75.75
	$\frac{5}{8}$	27.60	41.60	51.50	64.50	72.00	84.00	88.50
	1	31.50	47.50	58.75	73.50	82.00	96.00	101.25
	$\frac{3}{4}$	24.60	37.00	45.75	57.25	64.00	75.00	79.00
3 $\frac{1}{2}$	$\frac{5}{8}$	29.30	44.00	54.50	68.25	76.00	89.00	93.75
	1	34.00	51.00	63.25	79.25	88.00	103.00	108.50
	$\frac{3}{4}$	33.60	50.70	63.00	79.00	88.00	103.00	108.50
	$\frac{5}{8}$	38.40	57.90	72.00	90.25	100.00	117.00	123.25
4	1 $\frac{1}{4}$	48.00	72.30	90.00	112.75	124.00	145.00	153.00

CAST-IRON PIPE STANDARD

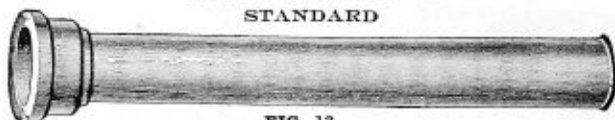


FIG. 13

STANDARD THICKNESS AND WEIGHTS OF CAST-IRON PIPE, BELL AND SPIGOT PIPE.

All lengths to lay 12 feet. All weights are approximate; those per foot include allowance for bell. All pipe is tested by water pressure. Turned and bored pipe made to order only.

Nominal Inside Diameter, Inches	Class A, Gas, 100-Foot Head, 43 Pounds Pressure		Class B, Standard, 200-Foot Head, 86 Pounds Pressure		Class C, Med. Heavy, 300-Foot Head, 130 Pounds Pressure		Class D, Extra Heavy, 400-Foot Head, 173 Pounds Pressure	
	Thick- ness, Inches	Weight Per Foot, Pounds	Thick- ness, Inches	Weight Per Foot, Pounds	Thick- ness, Inches	Weight Per Foot, Pounds	Thick- ness, Inches	Weight Per Foot, Pounds
3	.39	14.5	.42	16.2	.45	17.1	.48	18.0
4	.42	20.0	.45	21.7	.48	23.3	.52	25.0
6	.44	30.8	.48	33.3	.51	35.8	.55	38.3
8	.46	42.9	.51	47.5	.56	52.1	.60	55.8
10	.50	57.1	.57	63.8	.62	70.8	.68	76.7
12	.54	72.5	.62	82.1	.68	91.7	.75	100.0
14	.57	89.6	.66	102.5	.74	116.7	.82	129.2
16	.60	108.3	.70	125.0	.80	143.8	.89	158.3
18	.64	129.2	.75	150.0	.87	175.0	.96	191.7
20	.67	150.0	.80	175.0	.92	208.3	1.03	229.2
24	.76	204.2	.89	233.3	1.04	279.2	1.16	306.7
30	.88	291.7	1.03	333.3	1.20	400.0	1.37	450.0
36	.99	391.7	1.15	454.2	1.36	545.8	1.58	625.0
42	1.10	512.5	1.28	591.7	1.54	716.7	1.78	825.0
48	1.26	666.7	1.42	750.0	1.71	908.3	1.96	1050.0
54	1.35	800.0	1.55	933.3	1.90	1141.7	2.23	1341.7
60	1.39	916.7	1.67	1104.2	2.00	1341.7	2.38	1583.3
72	1.62	1283.4	1.95	1545.8	2.39	1904.2	.....	.....
84	1.72	1633.4	2.22	2104.2	.....	.....	.....	.....

FLANGED WATER PIPE

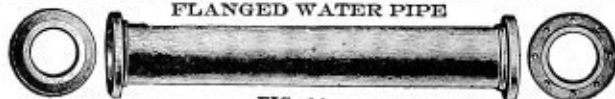


FIG. 14

Flanged cast-iron pipe, sizes 3 to 48 inches, same thickness as standard pipe. Thickness of flange equals approximately $1\frac{1}{2}$ times thickness of pipe, plus $\frac{1}{8}$ inch. Pipe made in 12-foot lengths and faced $\frac{1}{16}$ inch short for gaskets.

APPROXIMATE WEIGHTS OF LEAD AND HEMP REQUIRED FOR JOINTS

Pipe	inches	3	4	6	8	10	12	14	16	18	20
Lead, 2 inches thick...	pounds	6	7.5	10.25	13.25	16	19	22	30	33.8	37
Hemp	pounds	.18	.21	.31	.44	.53	.61	.81	.94	1	1.25
Pipe	inches	24	30	36	42	48	54	60	72	84	....
Lead, 2 inches thick...	pounds	44	54.25	64.75	75.25	85.5	97.6	108.30	128	147	....
Hemp	pounds	1.50	2.06	3	3.62	4.37	6.25	8.25	12.5	15	....

Inquiries and orders should clearly indicate the approximate number of lengths or feet of pipe of each size and class required. Give the desired delivery point and time of shipment, with any particulars as to sizes required first, the service intended, etc.; this will facilitate prompt attention and avoid delays.

SPECIALS FOR CAST-IRON PIPE

Quarter Bend



FIG. 15

Eighth Bend



FIG. 16

Sixteenth Bend



FIG. 17

Tee



FIG. 18

Cross



FIG. 19

QUARTER BENDS, 90°

Size	inches	3	4	6	8	10	12	14	16	18	20	24	30	36
Weight	pounds	50	60	95	155	215	290	355	495	575	745	1040	1580	2230

EIGHTH BENDS, 45°

Size	inches	3	4	6	8	10	12	14	16	18	20	24	30	36
Weight	pounds	40	50	70	115	160	210	260	355	405	515	715	1060	1490

SIXTEENTH BENDS, 22 1/2°

Size	inches	3	4	6	8	10	12	14	16	18	20	24	30	36
Weight	pounds	35	45	60	100	130	170	210	280	320	410	555	800	1120

TEES

Size, Inches	Weight, Pounds	Size, Inches	Weight, Pounds	Size, Inches	Weight, Pounds	Size, Inches	Weight, Pounds
3 x 3 x 3	65	8 x 8 x 4	175	12 x 12 x 10	375	16 x 16 x 12	605
4 x 4 x 4	90	10 x 10 x 10	300	12 x 12 x 8	345	20 x 20 x 20	1100
6 x 6 x 6	130	10 x 10 x 8	275	12 x 12 x 6	300	24 x 24 x 24	1565
6 x 6 x 4	110	10 x 10 x 6	240	12 x 12 x 4	270	30 x 30 x 30	2415
8 x 8 x 8	230	10 x 10 x 4	220	14 x 14 x 14	525	36 x 36 x 36	3490
8 x 8 x 6	195	12 x 12 x 12	395	16 x 16 x 16	735	48 x 48 x 48	.....

CROSSES

Size, Inches	Weight, Pounds	Size, Inches	Weight, Pounds	Size, Inches	Weight, Pounds	Size, Inches	Wght., Pounds
3x3x3x3	85	8x 8x 4x 4	205	12x12x10x10	450	18x18x18x18	1055
4x4x4x4	115	10x10x10x10	380	12x12x 8x 8	405	20x20x20x20	1335
6x6x6x6	165	10x10x 8x 8	340	12x12x 6x 6	335	24x24x24x24	1800
6x6x4x4	135	10x10x 6x 6	280	12x12x 4x 4	300	30x30x30x30	2850
8x8x8x8	290	10x10x 4x 4	250	14x14x14x14	.....	36x36x36x36	4160
8x8x6x6	230	12x12x12x12	495	16x16x16x16	.....	48x48x48x48	.....

Sleeve



FIG. 20

Plug



FIG. 21

Cap



FIG. 22

Size	inches	3	4	6	8	10	12	14	16	18	20	24	30	36	48
Weight, sleeves	pounds	35	45	60	75	100	125	150	175	200	240	345	475	630	.....
Weight, plugs	pounds	8	15	20	30	40	.....	.....	.....	.....	.....	.....	.....	.....	.....
Weight, caps	pounds	20	25	40	60	85	110	145	165	235	290	435	680	1015	.....

WRITE FOR SPECIAL LIST FOR LARGE SIZES.

SPIRAL RIVETED PRESSURE PIPE



FIG. 23

PRICE LIST—PLAIN ENDS EXTRA HEAVY WEIGHT

ASPHALTED FOR

Intake Mains, Water Works, Hydraulic Mining, Water Supply Lines

GALVANIZED AND FLANGED

Compressed Air, Pump Suction, Condenser Pipes, Vacuum Pipes, Etc.

Diameter, Inches	Thickness Gauge, Number	Galvanized, Price Per Lineal Foot	Asphalted, Price Per Lineal Foot	Approximate Weight Per Foot	Approximate Bursting Pressure
3	18	\$0.527	\$0.392	2.3	2000
4	16	.728	.520	3.7	1875
5	16	.882	.631	4.5	1500
6	14	1.207	.867	6.6	1560
7	14	1.410	1.012	7.7	1340
8	14	1.620	1.161	8.8	1170
9	14	1.812	1.300	9.9	1045
10	14	2.013	1.445	11.0	935
11	14	2.198	1.576	12.0	850
12	14	2.395	1.719	13.0	780
13	14	2.59	1.86	14.1	720
14	12	3.89	2.77	22.2	940
15	12	4.16	2.97	23.7	875
16	12	4.43	3.15	25.2	820
18	12	4.84	3.40	27.6	730
20	12	5.37	3.82	30.6	660
22	10	7.26	5.15	42.2	765
24	10	7.88	5.59	45.7	705
26	10	8.53	6.05	49.5	650
28	8	10.93	7.78	63.6	735
30	8	11.80	8.39	68.7	685
32	8	12.76	9.10	74.3	645
36	8	14.33	10.20	83.4	570
40	8	15.87	11.29	92.4	515

The above list is for pipe in twenty-foot lengths, plain ends. For prices on flanges, see following page.

For shorter lengths a slight additional charge is made.

Send us your specifications, advising for what purpose the pipe is intended, and we will quote special prices on Pipe and Fittings best suited to the work.

FORGED STEEL FLANGES FOR SPIRAL RIVETED PIPE

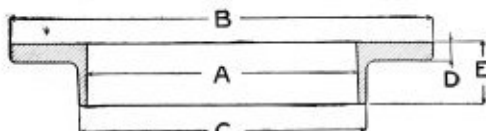


FIG. 24

SPIRAL PIPE STANDARD DIAMETER AND DRILLING PRICES AND DIMENSIONS

Size, Inches	Outside Diameter, Inches	Thick- ness of Flange, Inches	Price, Each, with Bolt Holes				Dimensions of Drilling		
			Black		Galvanized		Num- ber of Bolts	Size of Bolts, Inches	Diam. of Bolts Circle, Inches
			Flange Not Attached	Flange Attached to Pipe	Flange Not Attached	Flange Attached to Pipe			
3	6	$\frac{5}{16}$	\$0.90	\$1.75	\$1.10	\$1.90	4	$\frac{7}{16}$	4 $\frac{3}{4}$
4	7	$\frac{5}{16}$	1.05	2.05	1.30	2.30	8	$\frac{7}{16}$	5 $\frac{15}{16}$
5	8	$\frac{5}{16}$	1.35	2.40	1.60	2.70	8	$\frac{7}{16}$	6 $\frac{15}{16}$
6	9	$\frac{3}{8}$	1.60	2.75	2.00	3.15	8	$\frac{1}{2}$	7 $\frac{7}{8}$
7	10	$\frac{3}{8}$	1.70	2.95	2.15	3.40	8	$\frac{1}{2}$	9
8	11	$\frac{3}{8}$	2.15	3.45	2.80	4.05	8	$\frac{1}{2}$	10
9	13	$\frac{3}{8}$	2.65	4.10	3.50	4.90	8	$\frac{1}{2}$	11 $\frac{1}{4}$
10	14	$\frac{3}{8}$	2.95	4.50	3.95	5.45	8	$\frac{1}{2}$	12 $\frac{1}{4}$
11	15	$\frac{7}{16}$	3.10	4.65	4.15	5.65	12	$\frac{1}{2}$	13 $\frac{3}{8}$
12	16	$\frac{7}{16}$	3.25	4.75	4.35	5.85	12	$\frac{1}{2}$	14 $\frac{1}{4}$
13	17	$\frac{7}{16}$	3.60	5.15	4.85	6.25	12	$\frac{1}{2}$	15 $\frac{1}{4}$
14	18	$\frac{7}{16}$	3.80	5.50	5.10	6.80	12	$\frac{1}{2}$	16 $\frac{1}{4}$
15	19	$\frac{9}{16}$	4.75	7.75	6.35	9.35	12	$\frac{1}{2}$	17 $\frac{7}{16}$
16	21 $\frac{1}{4}$	$\frac{5}{8}$	6.50	8.60	9.00	11.00	12	$\frac{1}{2}$	19 $\frac{1}{4}$
18	23 $\frac{1}{4}$	$\frac{5}{8}$	7.90	10.30	11.00	13.35	16	$\frac{5}{8}$	21 $\frac{1}{4}$
20	25 $\frac{1}{4}$	$\frac{5}{8}$	9.30	12.50	12.75	15.85	16	$\frac{5}{8}$	23 $\frac{3}{8}$
22	28 $\frac{1}{4}$	$1\frac{1}{16}$	11.60	15.95	15.90	20.25	16	$\frac{5}{8}$	26
24	30	$1\frac{1}{16}$	13.00	18.00	17.70	22.70	16	$\frac{5}{8}$	27 $\frac{3}{4}$
26	32	.....	13.50	18.25	18.95	23.70	24	$\frac{3}{4}$	29 $\frac{3}{4}$
28	34	.....	14.25	19.50	20.15	25.40	28	$\frac{3}{4}$	31 $\frac{3}{4}$
30	36	.....	15.25	21.25	21.60	27.60	28	$\frac{3}{4}$	33 $\frac{3}{4}$
32	38	.....	16.00	22.75	22.75	29.50	28	$\frac{3}{4}$	35 $\frac{3}{4}$
34	40	.....	17.00	24.50	24.25	31.75	28	$\frac{3}{4}$	37 $\frac{3}{4}$
36	42	.....	18.50	26.00	26.10	33.60	32	$\frac{3}{4}$	39 $\frac{3}{4}$
40	46	.....	20.00	28.75	28.50	37.25	32	$\frac{3}{4}$	43 $\frac{3}{4}$

Thickness of flanges 26 inches and over is dependent on service required.
We furnish threaded companion flanges to match the above standard.

USES FOR "MICHIGAN" COMBINATION STEEL AND WOOD PIPE

We recommend it for use in conveying liquids of all kinds, in all climates. A few specific uses are mentioned below to better familiarize you with its scope.

FOR CONVEYING WATER IN CONNECTION WITH:

Municipal or Private Supply and Distribution Systems, either gravity or direct pumping.
Mines and Railroads.
Irrigation Projects.
Feed-water lines for Mills and Factories.
Estates, Hunting Clubs, Summer Resorts, Farms, Military Camps and Munition Plants.
Hydro-electric Plants.
Fish Hatcheries.

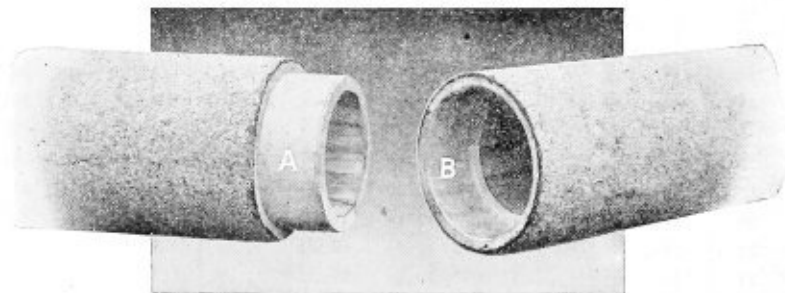
FOR CONVEYING:

Liquors in Tanneries.
Hot Slop from Distilleries.
Acids and Gases in Chemical Plants.
Pulp, Acid or Stock in Paper Mills.
Mineral Waters for Bottling Purposes.
Heavy Fluids containing Grit, etc.
Acid Fumes, both hot and cold, in Chemical and Alcohol Plants.
Water and Culm in Anthracite Mines.
Acidulous and Sulphurous Water.

Wood Pipe may be used to advantage because it is Corrosion Proof, does not Pit, Scale or Clog and is not affected by electrolysis.

17 REASONS WHY YOU SHOULD USE ABOVE PIPE

1. Durability of wood shell.
2. Sanitary.
3. 20% more volume.
4. Simplicity in handling.
5. Light in weight.
6. Speed in laying.
7. Protects against freezing.
8. Not affected by electrolysis.
9. Rigid inspection of materials.
10. Efficient construction of stave.
11. Strength of steel banding.
12. Protection of banding with asphalt coating.
13. Cannot burst under pressure.
14. Can be laid in a wet trench.
15. Short curves without specials.
16. Low installation and maintenance cost.
17. Responsibility of Company.



Showing Tenon and Mortise Joint

FIG. 25

A maul and a tripod are all the equipment necessary to drive the pipe home. This means economy—one of the greatest advantages of wood pipe over all other kinds.

The sections of pipe are put together merely by entering the tenon (A) into the mortise (B) and driving them up tightly.

This insures a perfect joint.

The other form of tenon is the thimble which is inserted in the socket of the pipe. This thimble may be furnished in sizes up to 6 inches, but is only supplied when specified.

"MICHIGAN" WOOD MINE AND ACID PIPE**FIG. 26**

Manufactured from selected white pine and Michigan tamarack timber, thoroughly inspected and seasoned, spirally bound under heavy tension with steel hoop or galvanized steel wire and coated with imperishable asphaltum cement.

We are continually receiving inquiries from operators of mines, collieries, acid and chemical plants for a pipe that will resist the action of sulphur and other injurious substances. In many cases iron pipe is thoroughly eaten through, rendering a line useless in from three to nine months, so destructive is the water conveyed. "Michigan" Mine and Acid Pipe is absolutely unaffected by sulphur and many other substances injurious to iron pipe.

For price list see water pipe list below.

We also furnish a hard maple pipe for the conveyance of mine culm or water containing bits of rock, etc. This pipe is not destroyed by action of this sort but wears smooth on the interior surface and outlives a metal pipe a great many times.

MICHIGAN COMBINATION STEEL AND WOOD WATER PIPE

FOR MUNICIPAL AND PRIVATE WATER SUPPLY WITHSTANDS 200 LBS. HYDRAULIC PRESSURE

**FIG. 27**

When writing for quotations mention whether the pipe is for use in gravity or direct pumping system and the head or pressure to be sustained.

Size, Inches	Weight per Lineal Foot	43 Pounds Pressure Price, Lineal Foot	85 Pounds Pressure Price, Lineal Foot	130 Pounds Pressure Price, Lineal Foot	172 Pounds Pressure Price, Lineal Foot
2	5	\$0.52	\$0.56	\$0.60	\$0.64
3	8	.72	.76	.84	.88
4	10	.92	1.00	1.04	1.12
5	18	1.24	1.32	1.36	1.40
6	15	1.44	1.48	1.52	1.56
7	16	1.64	1.72	1.80	1.88
8	17	1.88	1.96	2.04	2.12
10	23	2.28	2.36	2.44	2.52
11	24	2.52	2.60	2.68	2.76
12	25	2.68	2.76	2.84	2.92
14	31	3.08	3.20	3.32	3.44
16	33	3.48	3.60	3.76	3.92
18	38	3.88	4.04	4.24	4.44
20	42	4.80	5.08	5.40	.....
22	44	5.40	5.72	.....	.....
24	55	6.20	6.68	.....	.....
30	100	10.00	11.00	.....	.....

Weights up to and including 5-inch are based on solid tamarack water pipe. 6-inch and up on white pine, which accounts for slight difference.

MICHIGAN TIN LINED WOOD CASINGS FOR INSULATING UNDERGROUND STEAM PIPES



FIG. 28

Specify inside diameter of wrought iron pipe to be covered.
Spirally banded with galvanized wire and coated with imperishable asphaltum cement, 4-inch and 3-inch thickness of shell.

PRICES PER FOOT

Size Wrought Pipe.....	1	1½	2	2½	3	3½	4	5	6	7	8	9	10	12	14	(O.D.) 16	(O.D.) 18	(O.D.) 20
Inside Diam. Wood Casing...	3	3½	4	4½	5	5½	6	7	8½	9½	11	12	13	15	17½	18½	21	23
4-inch (Tin Lined).....	2.04	2.00	2.08	2.16	2.24	2.40	2.54	2.88	3.40	3.86	4.48	4.94	5.46	6.48	8.56	11.00	13.74	17.84
Shell (Unlined).....	1.60	1.66	1.70	1.76	1.80	1.96	2.06	2.36	2.80	3.20	3.76	4.16	4.60	5.50	7.50	10.00	12.50	16.50
3-inch (Tin Lined).....	1.38	1.46	1.54	1.60	1.74	1.86	1.98	2.42	2.63	3.03	3.44	3.84	4.88	5.88	8.00	10.56	13.18	17.24
Shell (Unlined).....	1.06	1.10	1.16	1.20	1.30	1.40	1.50	1.80	2.26	2.63	3.03	3.60	4.08	4.96	6.96	9.46	11.96	15.90
2-inch (Tin Lined).....	.77	.86	.97	1.04	1.12	1.26	1.40	1.60	1.78	1.92	2.10	2.24	2.40	2.80	3.40	3.60	4.00	5.00
Shell (Unlined).....	.54	.64	.74	.80	.87	.99	1.06	1.32	1.44	1.56	1.76	1.90	2.08	2.40	3.00	3.40	3.80	4.80

2-IN. SHELL CASINGS

FOR LOW PRESSURE LINES

Although we invariably recommend the 4-inch or 3-inch shell casings for best results, we manufacture a 2-inch shell casing to fill the demand for materials of this nature.

This casing is manufactured from white pine staves in the same manner as the heavier materials.

I. D. Casing, Inches	I. D. Iron Pipe, Inches	Per Lineal Foot Weight	Price, Not Lined	Tin Lined
2	¾	5.	\$0.38	\$0.54
2½	¾-1	7.	.44	.66
3	1	8.	.54	.76
3½	1¼-1½	8.5	.64	.86
4	2	9.5	.74	.96
4½	2½	10.	.80	1.04
5	3	11.	.868	1.12
5½	3½	11.5	.96	1.26
6	4	12.	1.06	1.40
7	5	14.	1.26	1.60
8	6	15.	1.40	1.76
8½	6	15.5	1.44	1.78
9	7	16.	1.50	1.84
9½	7	17.	1.56	1.92
10	8	18.	1.62	1.96
11	8	20.	1.76	2.10
12	9	22.	1.90	2.22
13	10	24.	2.06	2.40
14	11	27.	2.30	2.68
15	12	30.	2.40	2.80
16	13	33.	2.60	3.00
17½	14	37.	3.00	3.40
18½	16	40.	3.40	3.60

Weights of above same as water pipe weights.

Michigan casings make it possible to do away with the inconveniences and disadvantages of overhead lines. They save space.

VITRIFIED SEWER PIPE AND FITTINGS

SEWER PIPE

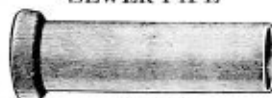


FIG. 29

Size	inches	3	4	5	6	8	9	10	12	15
Weight, per foot.....	lbs.	7	9	12	15	23	28	35	43	60
Price, " "		\$0.30	\$0.30	\$0.45	\$0.45	\$0.70	\$1.05	\$1.05	\$1.35	\$1.80
Size	inches	18	20	22	24	27	30	33	36	
Weight, per foot.....	lbs.	85	100	130	140	224	252	310	350	
Price, " "		\$2.50	\$3.00	\$4.00	\$4.50	\$6.50	\$7.20	\$9.00	\$10.25	

FITTINGS

Elbow



FIG. 30

1-Foot Curve



FIG. 31

2-Foot Curve



FIG. 32

Size	inches	3	4	5	6	8	9	10	12	15
Price	each	\$1.20	\$1.20	\$1.80	\$1.80	\$2.80	\$4.20	\$4.20	\$5.40	\$7.20
Size	inches	18	20	22	24	27	30	33	36	
Price	each	\$10.00	\$12.00	\$16.00	\$18.00	\$26.00	\$28.80	\$36.00	\$41.00	

Y Branch



FIG. 33

T Branch



FIG. 34

Increaser



FIG. 35

Reducer



FIG. 36

Y AND T BRANCHES—1 OR 2-FOOT, INLETS UP TO 12 INCHES INCLUSIVE

Size	inches	3	4	5	6	8	9	10	
Price	each	\$1.20	\$1.20	\$1.80	\$1.80	\$2.80	\$4.20	\$4.20	
Size	inches	12	15	18	20	22	24		
Price	each	\$5.40	\$7.20	\$10.00	\$12.00	\$16.00	\$18.00		

Y AND T BRANCHES—2½ OR 3-FOOT, INLETS UP TO 12 INCHES INCLUSIVE

Size	inches	3	4	5	6	8	9	10	12	15
Price	each	\$1.50	\$1.50	\$2.25	\$2.25	\$3.50	\$5.25	\$5.25	\$6.75	\$9.00
Size	inches	18	20	22	24	27	30	33	36	
Price	each	\$12.50	\$15.00	\$20.00	\$22.50	\$32.50	\$36.00	\$45.00	\$51.25	

Y AND T BRANCHES—2½ OR 3-FOOT, INLETS 15 INCHES OR LARGER

Size	inches	15	18	20	22	24	27	30	33	36
Price	each	\$12.50	\$17.50	\$21.00	\$28.00	\$31.50	\$39.00	\$43.20	\$54.00	\$61.50

INCREASERS AND REDUCERS

Size	inches	3	4	5	6	8	9	10	12	15
Price	each	\$1.20	\$1.20	\$1.80	\$1.80	\$2.80	\$4.20	\$4.20	\$5.10	\$7.20
Size	inches	18	20	22	24	27	30	33	36	
Price	each	\$10.00	\$12.00	\$16.00	\$18.00	\$28.00	\$26.00	\$28.90	\$41.00	

LONG SCREWS AND COUPLINGS

Long Screw



FIG. 37

Standard Coupling



FIG. 38

Faced Coupling



FIG. 39

LONG SCREWS WITH COUPLING AND LOCKNUT
FACED

Size .....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Black .....each	\$0.30	0.35	0.40	0.55	0.75	1.00	1.30	1.70	2.70	3.70	5.40	6.60
Galvanized	.35	.40	.50	.66	1.00	1.25	1.60	2.10	3.10	4.70	6.50	7.75
Standard Length.....in.	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	7	8	$8\frac{1}{2}$	9

STANDARD WROUGHT IRON COUPLINGS

Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Black. ....each	\$0.05	\$0.05	\$0.06	\$0.07	\$0.10	\$0.13	\$0.17	\$0.21	\$0.28	\$0.40	\$0.60
Galvanized....."	.06	.06	.08	.10	.13	.18	.25	.32	.40	.55	.80
Right and Left....."	.07	.07	.08	.11	.15	.20	.25	.30	.50	.85	1.20
" " " Galv....."	.08	.08	.10	.14	.18	.23	.33	.41	.62	1.00	1.40

Size.....Inches	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	12	14
Black.....each	\$0.80	\$1.00	\$1.50	\$1.65	\$2.40	\$3.25	\$4.25	\$5.50	\$7.50	\$10.00	\$18.75
Galvanized....."	1.05	1.40	2.00	2.25	3.25	4.20	5.50	7.00	9.75	13.65	23.85
Right and Left....."	1.60	2.00	8.20	9.00	12.50	13.00	17.00	17.50	23.00	28.00	.....
" " " Galv. "	1.90	2.40	8.75	9.65	13.35	13.95	18.25	19.00	25.25	31.65	.....

FACED COUPLINGS

Size..In.	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6
Black..ea.	\$0.09	\$0.10	\$0.12	\$0.16	\$0.22	\$0.30	\$0.40	\$0.50	\$0.70	\$0.90	\$1.20	\$1.50	\$2.10	\$2.40	\$3.00
Galv.. "	.14	.15	.18	.24	.33	.45	.60	.75	1.00	1.35	1.80	2.25	.....	.....	.....

EXTRA HEAVY OR HYDRAULIC COUPLINGS

Size .....inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price, Black.....each	\$0.14	.14	.20	.26	.34	.42	.56	.80	1.20	1.60	2.00
Price, Recessed, Black..each	.25	.25	.30	.35	.45	.55	.70	.95	1.40	1.85	2.25
Outside Diam.....inches	.95	1.13	1.44	1.63	2.07	2.31	2.81	3.31	4.00	4.63	5.13
Length.....inches	1.50	1.88	2.13	2.38	2.63	2.87	3.13	3.50	3.69	4.25	4.25
Threads to inch of screw....	18	14	$11\frac{1}{2}$	$11\frac{1}{2}$	$11\frac{1}{2}$	$11\frac{1}{2}$	8	8	8	8	8
Weight, each .....pounds	.23	.28	.50	.56	.90	1.35	1.80	2.40	3.46	5.25	6.80

CASING COUPLINGS

With Protecting Sleeve



FIG. 40

Without Sleeve



FIG. 41

Inside Diam. In.	2	2 1/4	2 1/2	2 3/4	3	3 1/4	3 1/2	3 3/4	4	4 1/4	4 1/2	4 3/4	5
Black.....each	\$0.16	\$0.20	\$0.25	\$0.30	\$0.35	\$0.40	\$0.46	\$0.52	\$0.60	\$0.68	\$0.74	\$0.80	\$0.90
Galvanized. "	.23	.28	.35	.42	.50	.57	.65	.73	.85	1.00	1.05	1.15	1.30
R. & L. Black "	1.70	1.80	2.00	2.10	2.50	2.60	3.00	3.10	3.70	3.95	4.55	4.85	5.25

Inside Diam. In.	5 1/8	5 3/8	6 1/8	6 3/8	7 1/8	7 3/8	8 1/8	8 3/8	9 1/8	10 1/8	11 1/8	12 1/8	13 1/8
Black.....each	\$1.00	\$1.20	\$1.35	\$1.50	\$1.65	\$1.75	\$2.25	\$2.85	\$3.50	\$4.50	\$5.15	\$6.75	\$7.60
Galvanized. "	1.40	1.70	1.90	2.15	2.35	2.50	3.25	3.75	5.00	6.15	6.95	8.85	10.15
R. & L. Black "	5.50	6.10	6.45	7.10	7.55	8.30	9.30	10.25	11.80	13.25	14.25	16.80	18.65

PATENT SLEEVE COUPLINGS

For Tubing, Line Pipe, and Drive Pipe

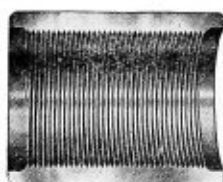


FIG. 42

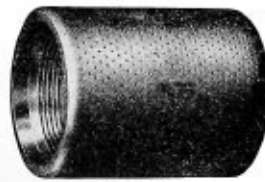


FIG. 43

Size.....Inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2
Black.....each	\$0.10	\$0.12	\$0.15	\$0.25	\$0.30	\$0.40	\$0.60	\$0.80	\$1.30
Galvanized....."	.14	.16	.21	.37	.46	.57	.85	1.15	1.90
R. & L. Black....."	.15	.18	.23	.38	.45	.70	1.20	1.60	2.60
R. & L. Galvanized "	.21	.25	.31	.53	.63	.98	1.70	2.25	3.65

Size.....Inches	4	4 1/2	5	6	7	8	9	20	12
Black.....each	\$1.50	\$2.00	\$2.40	\$2.80	\$3.85	\$4.00	\$5.00	\$6.00	\$8.00
Galvanized....."	2.15	2.85	3.45	4.00	5.55	5.80	7.25	8.75	11.15
R. & L. Black....."	3.00	7.75	8.50	9.75	10.00	11.50	12.00	14.75	18.25
R. & L. Galvanized "	4.20	9.15	10.50	12.00	12.75	15.75	16.75	20.25	25.50

DRESSER NO. 38 PIPE COUPLINGS



FIG. 44

No. 38, All-Steel Coupling is designed for plain or threaded-end pipe in sizes from 6 inches and up. Same is a perfect expansion joint, and in mechanical construction, strength, durability, etc., stands in a class by itself. With this coupling one obtains a continuous line of steel and is assured best possible results on high-pressure field-work.

6-inch I. D. Pipe Coupling, 1/4-inch Metal							
8	"	I. D.	"	1/4	"	"	.....
10	"	I. D.	"	1/4	"	"	.....
12	"	O. D.	"	1/4	"	"	.....
12	"	I. D.	"	1/4	"	"	Regular Section Rubber.....
12	"	I. D.	"	5/16	"	"	Heavy " ".....
14	"	O. D.	"	5/16	"	"	" " ".....
16	"	O. D.	"	5/16	"	"	" " ".....
18	"	O. D.	"	5/16	"	"	" " ".....
20	"	O. D.	"	5/16	"	"	" " ".....

Prices upon application.

DRESSER NO. 40 LONG SLEEVE PIPE COUPLING

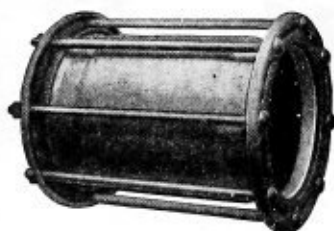


FIG. 45

The above cut shows the Long Steel Sleeves equipped with regular Reinforced Malleable-Iron Flanges. Same is used for expansion joints and repairing leaks on screw lines. We can furnish in sizes from 2 inches and up.

2 x 13-inch I. D. Pipe Sleeve.....	
3 x 13 " I. D. " ".....	
4 x 13 " I. D. " ".....	

Prices of above, and on larger sizes, upon application.

WROUGHT NIPPLES

Close Nipple



FIG. 46

Shoulder Nipple

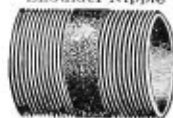


FIG. 47

PLAIN RIGHT HAND NIPPLES

Length, Inches			Size, In.	Prices			Price of Extra Long Nipples									
Close	Short	Long		Close or Short	Long		Length, Inches									
							4	5	6	7	8	9	10	11	12	
1	1 1/8	1 1/2	1 3/4	1 1/2	1 3/4	1 1/2	.04	.06	.07	.08	.10	.12	.14	.15	.17	.18
1	1 1/8	1 1/2	1 3/4	1 1/2	1 3/4	1 1/2	.04	.06	.07	.08	.10	.12	.14	.15	.17	.18
1	1 1/8	1 1/2	1 3/4	1 1/2	1 3/4	1 1/2	.04	.06	.07	.08	.10	.12	.14	.15	.17	.18
1	1 1/8	1 1/2	1 3/4	1 1/2	1 3/4	1 1/2	.05	.07	.08	.10	.12	.14	.16	.18	.20	.22
1	1 1/8	1 1/2	1 3/4	1 1/2	1 3/4	1 1/2	.06	.09	....	.11	.13	.17	.18	.20	.22	.24
1	1 1/8	1 1/2	1 3/4	1 1/2	1 3/4	1 1/2	.08	.13	....	.15	.18	.23	.25	.28	.31	.34
1	1 1/8	1 1/2	1 3/4	1 1/2	1 3/4	1 1/2	.11	.17	....	.20	.24	.29	.33	.36	.40	.44
1	1 1/8	1 1/2	1 3/4	1 1/2	1 3/4	1 1/2	.13	.20	....	.25	.29	.36	.40	.45	.50	.54
2	2 1/8	2 1/2	2 3/4	2 1/2	2 3/4	2 1/2	.18	.27	....	.32	.38	.50	.54	.59	.65	.72
2	2 1/8	2 1/2	2 3/4	2 1/2	2 3/4	2 1/2	.39	.59	....	.68	.90	.97	1.06	1.17	1.26	1.35
2	2 1/8	2 1/2	2 3/4	2 1/2	2 3/4	2 1/2	.48	.72	....	.85	1.08	1.20	1.33	1.45	1.58	1.70
2	2 1/8	2 1/2	2 3/4	2 1/2	2 3/4	2 1/2	.75	1.05	....	....	1.30	1.45	1.60	1.75	1.90	2.05
3	3 1/8	3 1/2	3 3/4	3 1/2	3 3/4	3 1/2	.85	1.20	....	....	1.52	1.69	1.87	2.05	2.22	2.40
3	3 1/8	3 1/2	3 3/4	3 1/2	3 3/4	3 1/2	1.25	1.70	....	....	2.25	2.50	2.75	2.95	3.17	3.40
3	3 1/8	3 1/2	3 3/4	3 1/2	3 3/4	3 1/2	1.55	2.45	....	....	2.58	2.83	3.10	3.35	3.60	3.85
3	3 1/8	3 1/2	3 3/4	3 1/2	3 3/4	3 1/2	1.85	2.90	....	....	3.05	3.35	3.70	4.00	4.30	4.65
3	3 1/8	3 1/2	3 3/4	3 1/2	3 3/4	3 1/2	3.20	....	....	3.60	4.05	4.45	4.90	5.30	5.75	6.15
3	3 1/8	3 1/2	3 3/4	3 1/2	3 3/4	3 1/2	3.55	....	....	4.05	4.55	5.05	5.50	6.00	6.50	7.00
4	4 1/8	4 1/2	4 3/4	4 1/2	4 3/4	4 1/2	5.25	....	....	....	6.50	7.10	7.75	8.40	9.00	....
4	4 1/8	4 1/2	4 3/4	4 1/2	4 3/4	4 1/2	6.75	....	....	....	8.25	8.90	9.70	10.40	11.15	....
4	4 1/8	4 1/2	4 3/4	4 1/2	4 3/4	4 1/2	8.00	....	....	....	10.00	10.80	11.75	12.70	13.65	....

Nipples made to order from extra heavy pipe at double above list, and special discount according to quantity ordered.

Nipples larger than 12-inch made to order and charged as cut pipe, and threads extra.

PLAIN RIGHT AND LEFT HAND NIPPLES

Length, Inches			Size, In.	Price, Each			Price of Extra Long Nipples, Each									
Close	Short	Long		Close or Short	Long		Length, Inches									
							4	5	6	7	8	9	10	11	12	
1	1 1/8	1 1/2	1 3/4	1 1/2	1 3/4	1 1/2	.05	.08	.09	.11	.13	.16	.18	.20	.23	.27
1	1 1/8	1 1/2	1 3/4	1 1/2	1 3/4	1 1/2	.05	.08	.09	.11	.13	.16	.18	.20	.23	.27
1	1 1/8	1 1/2	1 3/4	1 1/2	1 3/4	1 1/2	.05	.08	.09	.11	.13	.16	.18	.20	.23	.27
1	1 1/8	1 1/2	1 3/4	1 1/2	1 3/4	1 1/2	.07	.10	.11	.13	.16	.18	.21	.24	.27	.31
1	1 1/8	1 1/2	1 3/4	1 1/2	1 3/4	1 1/2	.08	.12	....	.15	.17	.23	.25	.27	.29	.35
1	1 1/8	1 1/2	1 3/4	1 1/2	1 3/4	1 1/2	.11	.18	....	.20	.24	.31	.33	.37	.41	.48
1	1 1/8	1 1/2	1 3/4	1 1/2	1 3/4	1 1/2	.15	.23	....	.27	.32	.39	.45	.50	.55	.65
1	1 1/8	1 1/2	1 3/4	1 1/2	1 3/4	1 1/2	.18	.27	....	.34	.39	.48	.52	.60	.67	.80
2	2 1/8	2 1/2	2 3/4	2 1/2	2 3/4	2 1/2	.24	.36	....	.43	.51	.67	.72	.80	.87	1.03
2	2 1/8	2 1/2	2 3/4	2 1/2	2 3/4	2 1/2	.52	.79	....	.91	1.20	1.30	1.40	1.55	1.68	1.80
2	2 1/8	2 1/2	2 3/4	2 1/2	2 3/4	2 1/2	.65	.96	....	1.13	1.44	1.60	1.77	1.93	2.10	2.27
3	3 1/8	3 1/2	3 3/4	3 1/2	3 3/4	3 1/2	1.00	1.40	....	....	1.75	1.95	2.15	2.35	2.55	2.75
3	3 1/8	3 1/2	3 3/4	3 1/2	3 3/4	3 1/2	1.15	1.60	....	....	2.00	2.25	2.50	2.75	3.00	3.25

Add 60 per cent to above prices for galvanized Right and Left Nipples.

WROUGHT NIPPLES GALVANIZED RIGHT HAND NIPPLES

Length, Inches						Size, Inches	Price, Each		Price of Extra Long Nipples, Each									
Close	Short	Long					Close or Short	Long	Length, Inches									
									4	5	6	7	8	9	10	11	12	
1	1 1/4	2	2 1/4	3	3 1/4	1 1/8	.06	.11	.12	.15	.17	.21	.24	.26	.29	.31	.34	
1	1 1/2	2	2 1/2	3	3 1/2	1 1/8	.06	.11	.12	.15	.17	.21	.24	.26	.29	.31	.34	
1	1 3/4	2	2 3/4	3	3 3/4	1 1/8	.06	.11	.13	.16	.18	.23	.26	.28	.31	.33	.36	
1	1 3/4	2	2 3/4	3	3 3/4	1 1/8	.08	.14	...	.18	.21	.26	.29	.32	.35	.38	.41	
1	1 3/4	2	2 3/4	3	3 3/4	1 1/8	.11	.19	...	.24	.28	.34	.38	.42	.47	.51	.55	
1	1 3/4	2	2 3/4	3	3 3/4	1 1/8	.17	.29	...	.32	.38	.45	.51	.57	.63	.69	.75	
1	1 3/4	2	2 3/4	3	3 3/4	1 1/8	.21	.35	...	.39	.46	.55	.63	.70	.77	.84	.91	
2	2 1/4	3	3 1/4	4	4 1/4	2 1/8	.27	.47	...	.52	.61	.74	.83	.93	1.03	1.13	1.23	
2	2 1/4	3	3 1/4	4	4 1/4	2 1/8	.56	.86	...	1.00	1.26	1.41	1.56	1.71	1.86	2.01	2.16	
2	2 1/4	3	3 1/4	4	4 1/4	2 1/8	.70	1.10	...	1.30	1.60	1.80	2.00	2.20	2.40	2.60	2.80	
2	2 1/4	3	3 1/4	4	4 1/4	2 1/8	1.20	1.70	...	2.10	2.35	2.60	2.85	3.15	3.40	3.65	3.90	
3	3 1/4	4	4 1/4	5	5 1/4	3 1/8	1.35	1.87	...	2.30	2.60	2.90	3.20	3.50	3.80	4.10	4.40	
3	3 1/4	4	4 1/4	5	5 1/4	3 1/8	1.85	2.60	...	3.30	3.65	4.05	4.45	4.85	5.25	5.65	6.05	
3	3 1/4	4	4 1/4	5	5 1/4	3 1/8	2.30	3.15	...	3.75	4.20	4.60	5.00	5.40	5.85	6.25	6.65	
3	3 1/4	4	4 1/4	5	5 1/4	3 1/8	2.80	4.25	...	4.50	5.00	5.55	6.05	6.60	7.15	7.65	8.15	
4	4 1/4	5	5 1/4	6	6 1/4	4 1/8	4.25	4.95	...	5.65	6.35	7.05	7.75	8.45	9.20	9.90	10.60	
4	4 1/4	5	5 1/4	6	6 1/4	4 1/8	5.00	5.80	...	6.65	7.50	8.35	9.25	10.10	10.95	11.80	12.65	



FIG. 48

WROUGHT SWEDGED NIPPLES PIPE SIZES

Size, inches	1x1 1/4	2x1	2x1 1/4	2x1 1/2	2 1/2 x 1 1/2	2 1/2 x 2	3x1	3x1 1/2	3x2	3x2 1/2	3 1/2 x 2
Price	\$1.00	1.50	1.40	1.25	1.75	1.50	3.00	2.75	1.85	1.75	3.50
Weight, lbs.	...	3.6	3.6	3.6	5.7	5.7	7.5	7.5	7.5	7.5	9.0
Size, inches	3 1/2 x 2 1/2	3 1/2 x 3	4x1	4x2	4x2 1/2	4x3	4x3 1/2	4 1/2 x 2	4 1/2 x 3	4 1/2 x 4	
Price	\$3.50	2.25	4.50	3.00	2.75	2.50	2.50	3.75	3.50	3.25	3.00
Weight, lbs.	9.0	9.0	10.5	10.5	10.5	10.5	10.5	12.5	12.5	12.5	12.5
Size, inches	5x2	5x2 1/2	5x3	5x3 1/2	5x4	5x4 1/2	6x2	6x2 1/2	6x3	6x3 1/2	6x4
Price	\$4.50	4.25	4.00	3.75	3.50	3.50	6.50	6.25	5.25	5.00	4.75
Weight, lbs.	14.5	14.5	14.5	14.5	14.5	14.5	18.8	18.8	18.8	18.8	18.8
Size, inches	6x4 1/2	6x5	6x5 1/2	6x5 3/4	7x4	7x5	7x6	8x2	8x3	8x4	8x4 1/4
Price	\$4.75	4.50	6.00	6.00	7.50	7.25	7.00	15.00	12.00	10.50	11.00
Weight, lbs.	18.8	18.8	18.8	18.8	23.3	23.3	23.3	28	28	28	28
Size, inches	8x5	8x5 1/2	8x6	8x6 1/4	8x6 3/8	10x2	10x3	10x4	10x6	10x6 1/4	10x8
Price	\$10.00	9.00	9.00	9.00	8.50	25.00	21.50	19.00	15.00	15.75	14.00
Weight, lbs.	28	28	28	28	28	60	60	60	60	60	60
Size, inches	10x8 1/4	12x2	12x3	12x4	12x6	12x8	12x10	...	...	...	...
Price	\$14.00	55.00	45.00	40.00	35.00	30.00	25.00	...	...	...	...
Weight, lbs.	60	72	72	72	72	72	72	...	...	...	...

SCREWED CAST IRON FITTINGS

Straight Elbow



FIG. 49

Right and Left Elbow



FIG. 50

Reducing Elbow



FIG. 51

45° Elbow



FIG. 52

STRAIGHT AND RIGHT AND LEFT ELBOWS

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	
Right Hand.....	each	\$0.05	.05	.06	.08	.10	.12	.16	.20	.28	.50	.75
Right Hand, Galv.....	each	.10	.10	.12	.16	.21	.32	.40	.56	1.00	1.50	
Right and Left Hand.....	each	.06	.06	.07	.09	.12	.18	.23	.32	.60	.85	
Pitched	each	.....	.....	.....	.10	.13	.20	.25	.35	.65	1.00	

Size	inches	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
Right Hand.....	each	\$1.05	1.20	1.75	2.00	2.75	4.70	6.75	9.00	13.50	20.00
Right Hand, Galv.....	each	2.10	2.40	3.50	4.00	5.50	9.40	13.50	18.00	27.00	40.00
Pitched	each	1.30	1.50	.....	.....	.....	.....	.....	.....	.....	.....

REDUCING ELBOWS

Size	inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Price	each	\$0.06	.07	.09	.12	.18	.23	.32	.60	.85	1.20
Price, Galv.....	each	.....	.14	.18	.24	.36	.46	.64	1.20	1.70	2.40
Price, Pitched	each	.....	.....	.10	.13	.20	.25	.35	.65	1.00	1.30

Size	inches	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
Price	each	\$1.40	2.00	2.30	3.15	5.40	7.75	10.50	15.50	23.00
Price, Galv.....	each	2.80	4.00	4.60	6.30	10.80	15.50	21.00	31.00	46.00

45° ELBOWS

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Price	each	\$0.06	.06	.07	.10	.12	.19	.24	.34	.60	.90	1.25
Price, Galv.....	each	.12	.12	.14	.20	.24	.38	.48	.68	1.20	1.80	2.50

Size	inches	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
Price	each	\$1.45	2.20	2.50	3.45	5.90	8.50	11.25	17.00	25.00
Price, Galv.....	each	2.90	4.40	5.00	6.90	11.80	17.00	22.50	34.00	50.00

We can make to order, 30° or any other special degree fittings, at a special price, according to sizes and quantities wanted.

60° AND 22½° CAST IRON ELBOWS

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	5	6
Price, 60° or 22½°.....	each	\$0.25	.30	.35	.45	.50	.60	1.10	1.65	2.75	5.00	7.00

SCREWED CAST IRON FITTINGS

Side Outlet Elbow



FIG. 53

Double Branch Elbow



FIG. 54

SIDE OUTLET ELBOWS

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Price	each	\$0.18	.24	.30	.48	.60	.84	1.50	2.25	3.15
Reducing	each	.21	.28	.35	.55	.68	.96	1.70	2.58	3.60
Size	inches	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
Price	each	\$3.60	5.25	6.00	8.25	14.00	20.00	26.00	40.00	60.00
Reducing	each	4.00	6.00	6.90	9.45	16.00	23.00	30.00	46.00	70.00

REDUCING DOUBLE BRANCH ELBOWS

Size	inches	$1 \times 1 \times 1\frac{1}{4}$	$1\frac{1}{4} \times 1\frac{1}{4} \times 1\frac{1}{2}$	$1\frac{1}{2} \times 1\frac{1}{2} \times 2$	$2 \times 2 \times 2\frac{1}{2}$
Price	each	\$0.75	1.05	1.50	2.25
Size	inches	$2\frac{1}{2} \times 2\frac{1}{2} \times 3$	$3 \times 3 \times 4$	$4 \times 4 \times 5$	$5 \times 5 \times 6$
Price	each	\$4.25	6.50	12.00	16.50

In describing Double Branch Elbows, the run is first named, then the inlet.

Straight Tee



FIG. 55

Reducing Tee



FIG. 56

Reducing Tee on Outlet



FIG. 57

TEES, STRAIGHT SIZES

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price	each	\$0.08	.08	.09	.12	.15	.23	.29	.41	.73	1.10
Price, Galv.	each	.16	.16	.18	.24	.30	.46	.58	.82	1.46	2.20
Size	inches	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
Price	each	\$1.50	1.75	2.55	3.00	4.00	6.80	9.75	13.00	19.50	29.00
Price, Galv.	each	3.00	3.50	5.10	6.00	8.00	13.60	19.50	26.00	39.00	58.00

REDUCING TEES

Size	inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Price	each	\$0.09	.10	.14	.17	.27	.33	.47	.83	1.25	1.75
Price, Galv.	each	.18	.20	.28	.34	.54	.66	.94	1.66	2.50	3.50
Size	inches	4	$4\frac{1}{2}$	5	6	7	8	9	10	12	
Price	each	\$2.00	2.95	3.50	4.60	7.80	11.25	15.00	22.50	33.50	
Price, Galv.	each	4.00	5.90	7.00	9.20	15.60	22.50	30.00	45.00	67.00	

SCREWED CAST IRON FITTINGS

Side Outlet Tee



FIG. 58

SIDE OUTLET TEES

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Price	each	\$0.27	.36	.45	.70	.90	1.25	2.25	3.25	4.50
Price, Reducing.....	each	.31	.42	.52	.80	1.00	1.45	2.58	3.73	5.15
Size	inches	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
Price	each	\$5.25	7.65	9.00	12.00	20.00	30.00	40.00	50.00	90.00
Price, Reducing.....	each	6.00	8.80	10.35	13.80	23.00	35.00	46.00	57.00	104.00

Straight Cross

Reducing Cross

Side Outlet Cross



FIG. 59



FIG. 60



FIG. 61

CROSSES—STRAIGHT SIZES

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Price	each	\$0.16	.22	.27	.42	.53	.75	1.30	2.00	2.70
Price, Galv.....	each	.32	.44	.54	.84	1.06	1.50	2.60	4.00	5.40
Size	inches	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
Price	each	\$3.15	4.60	5.50	7.25	12.25	17.50	23.50	35.00	52.50
Price, Galv.....	each	6.30	9.20	11.00	14.50	24.50	35.00	47.00	70.00	105.00

REDUCING CROSSES

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Price	each	\$0.18	.25	.30	.46	.60	.83	1.45	2.20	3.00
Price, Galv.....	each	.36	.50	.60	.92	1.20	1.66	2.90	4.40	6.00
Size	inches	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
Price	each	\$3.50	5.10	6.00	8.00	13.50	19.25	26.00	38.50	58.00
Price, Galv.....	each	7.00	10.20	12.00	16.00	27.00	38.50	52.00	77.00	116.00

SIDE OUTLET CROSSES

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Price	each	\$0.36	.48	.60	.95	1.20	1.65	3.00	4.50	6.30
Price, Reducing.....	each			.70	1.00	1.30	1.75	3.20	4.80	6.65
Size	inches	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
Price	each	\$7.20	10.50	12.00	16.50	28.00	40.00	52.00	80.00	120.00
Price, Reducing.....	each	7.75	11.50	13.00	17.50	30.00	43.00	56.00	86.00	130.00

SCREWED CAST IRON FITTINGS



FIG. 62



FIG. 63

RETURN BENDS, CLOSE PATTERN

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4
Price, Right Hand.....	each	\$0.18	.20	.22	.28	.40	.57	1.20	1.70	5.00
Price, Right and Left.....	each	.21	.23	.26	.32	.46	.66	1.40	1.95	5.25
Price, Left Hand.....	each	.21	.23	.26	.32	.46	.66	1.40	1.95	5.25
Price, Right Hand, Galv.....	each	.36	.40	.44	.56	.80	1.14	2.40	3.40	10.00
Center to Center.....	inches	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{1}{4}$	$2\frac{1}{2}$	$3\frac{1}{4}$	$3\frac{3}{4}$	$4\frac{1}{4}$	6

Close Pattern Return Bends will not make up parallel coils, as the distance, center to center, of two adjacent bends is greater than the center to center of openings of a single bend.

RETURN BENDS, CLOSE PATTERN, PITCHED

Suitable for Coils as Per Table Below

Size	inches	1	1	1	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{1}{2}$
Length of Pipe in Coil.....	feet	3	4	5	6	8	4	5	6
Price, Right Hand.....	each	\$0.26	.26	.26	.26	.26	.33	.33	.33

All Right and Left Pitched Return Bends are made to order.

One inch Return Bends for coils longer than 8 feet are tapped straight.

Pitched Return Bends have length of coils marked on them.

RETURN BENDS, OPEN PATTERN

Size	inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4
Price, Right Hand.....	each	\$0.26	.30	.40	.55	.80	1.35	2.20	6.50
Price, Right and Left.....	each	.30	.35	.46	.64	.92	1.55	2.50	.....
Price, Right Hand, Galv.....	each	.52	.60	.80	1.10	1.60	2.70	4.40	10.00
Center to Center.....	inches	$1\frac{1}{8}$	$2\frac{1}{8}$	3	$3\frac{1}{8}$	$4\frac{1}{8}$	$5\frac{1}{8}$	$6\frac{1}{8}$	$7\frac{1}{8}$



FIG. 64

BACK OUTLET
RETURN BENDS

Size	inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Right Hand.....	each	\$0.38	.42	.60	.80	1.15	2.00	3.00
Price, Right and Left.....	each	.42	.48	.70	.95	1.30	2.30	3.50
Price, Right Hand, Galv.....	each	.76	.84	1.20	1.60	2.30	4.00	6.00
Center to Center.....	inches	$1\frac{1}{8}$	$2\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{1}{2}$	$3\frac{1}{4}$	$3\frac{3}{4}$	$4\frac{1}{4}$

RETURN BENDS, BACK OUTLET

Special Patterns: Made to Order Only

Size	inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Center to Center.....	inches	4	$3\frac{1}{4}$	4	4
Size, Back Outlet.....	inches	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$

The back outlet of Right and Left Return Bends is always tapped right hand.

SCREWED CAST IRON FITTINGS

WIDE PATTERN, RIGHT HAND



FIG. 65

With Union Ends



FIG. 66

RETURN BENDS

Size	inches	1	1	1	1	1	1½	1½	
Price	each	\$0.45	.50	.60	.75	1.00	1.00	1.25	
Price, Galv.....	each	.80	.90	1.10	1.30	1.60	1.75	2.00	
Center to Center.....	inches	3	4	5	6	8	4	6	
Size	inches	1½	1½	1½	2	2	2	2	
Price	each	\$1.30	1.60	2.00	1.75	2.00	3.00	3.50	7.50
Price, Galv.....	each	2.30	2.60	3.25	3.00	3.25	4.50	5.00	11.00
Center to Center.....	inches	4½	6	8	4½	6	7	8	11

RETURN BENDS WITH UNION ENDS

Size	inches	1½	2
Price	each	\$1.60	3.00
Center to Center.....	inches	4½	6



FIG. 67

Y BENDS

Size	inches	½	¾	1	1¼	1½	2	2½	3	3½
Price	each	\$0.20	.28	.34	.54	.66	.94	1.66	2.50	3.50
Price, Galv.....	each	.40	.56	.68	1.08	1.32	1.88	3.32	5.00	7.00
Price, Reducing.....	each	.23	.33	.40	.62	.76	1.08	1.90	2.90	4.00
Size	inches	4	4½	5	6	7	8	10	12	
Price	each	\$4.00	5.90	7.00	9.20	15.60	22.50	45.00	67.00	
Price, Galv.....	each	8.00	11.80	14.00	18.40	31.20	45.00	90.00	134.00	
Price, Reducing.....	each	4.60	6.65	8.00	10.60	18.00	26.00	51.75		

BRANCH TEES

No. 1 for Circulation—Run Open



FIG. 68

No. 2 for Circulation—Inlet and Outlet Open



FIG. 69

No. 3 for Box Coils—Inlet Open



FIG. 70

Size inches	1		1¼			1½			2		
Center to center . inches	2½		3			3½			4½		
Run inches	1 and 1¼		1½	2	2½	1½ and 2	2½	3	2	2½ and 3	3½
Prices, each											
2 branches	\$0.90	\$1.00	\$1.15	.....	.....	.....	.....	.....	.....	.....	.....
3 " " " " " " " "	1.05	1.15	1.35	1.65	1.90	2.40	2.70	3.45	3.80	5.25	5.75
4 " " " " " " " "	1.15	1.30	1.60	2.00	2.40	2.85	3.35	4.15	4.60	6.40	7.00
5 " " " " " " " "	1.35	1.45	1.85	2.40	2.90	3.55	4.00	5.00	5.50	7.65	8.50
6 " " " " " " " "	1.60	1.75	2.10	2.80	3.30	3.95	4.65	5.75	6.25	8.80	9.75
7 " " " " " " " "	1.90	2.20	2.45	3.20	3.90	4.20	5.25	6.50	7.25	10.60	11.75
8 " " " " " " " "	2.20	2.45	2.75	3.60	4.50	4.95	5.85	7.00	7.75	11.50	12.75
9 " " " " " " " "	2.65	2.90	3.40	4.30	5.25	6.15	6.50	8.25	9.00	12.25	13.50
10 " " " " " " " "	.....	3.30	4.00	4.80	5.85	6.85	7.60	9.25	10.00	13.50	15.00
11 " " " " " " " "	.....	4.50	4.80	5.00	6.25	7.25	8.00	9.75	10.75	.....	.....
12 " " " " " " " "	.....	4.75	5.10	5.25	6.50	7.65	8.50	10.50	11.50	.....	.....
13 " " " " " " " "	.....	5.50	6.00	6.00	7.00	8.25	.....	.....	.....	.....	.....
14 " " " " " " " "	.....	7.00	7.25	6.75	7.75	9.00	.....	.....	.....	.....	.....
15 " " " " " " " "	.....	7.50	7.75	7.50	8.50	9.75	.....	.....	.....	.....	.....
16 " " " " " " " "	.....	8.00	8.25	8.50	9.50	10.75	.....	.....	.....	.....	.....

All openings in Branch Tees for circulation are tapped right hand.

Branch Tees for box coils are always tapped left hand in branches and right hand in back inlet.

The run and back opening of Branch Tees are tapped the same size as branches unless otherwise ordered.

1-inch Branch Tees, 1-inch or 1¼-inch run, are 1¼ inches inside diameter.

1-inch Branch Tees, ½-inch or 2-inch run, are 2¼ inches inside diameter.

1¼-inch Branch Tees are all 2½ inches inside diameter.

1½-inch Branch Tees are all 2¾ inches inside diameter.

2-inch Branch Tees are all 3½ inches inside diameter.

Always order Branch Tees by size and number.

SCREWED CAST IRON FITTINGS ECCENTRIC TEES



FIG. 71



FIG. 72

The object of these fittings is to prevent lodging places for water, which always is the case where double reducing fittings are used.

Some engineers believe that the lodgment of water causes the pipe to eat away by rust.

Inquiries and orders for Eccentric Tees should be accompanied with a sketch showing the exact position in which the fitting is to be placed.

Prices on Application.



FIG. 73

ECCENTRIC REDUCER

Size	inches	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Price	each	\$0.55	.72	1.00	1.50	2.40	3.00	4.00
Size	inches	5	6	8	9	10	12	.....
Price	each	\$6.00	8.00	11.00	12.50	14.00	18.00	.....



FIG. 74

ECCENTRIC BUSHINGS

Size	inches	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2
Price	each	\$0.22	.25	.27	.42	.60	.80	1.00	1.50
Size	inches	5	6	7	8	9	10	12	.....
Price	each	1.85	2.50	3.75	5.50	6.50	7.50	10.00	.....

OFFSETS.

Size	inches	3/4	1	1 1/4	1 1/2	2	2 1/2
Price, to Offset 4 in. each		\$0.45	.70	1.00	1.20	1.80	3.00
Price, to Offset 6 in. each		.67	1.05	1.50	1.80	2.70	4.50
Price, to Offset 8 in. each		.90	1.40	2.00	2.40	3.60	6.00
Size	inches	3	3 1/2	4	5	6	.....
Price, to Offset 4 in. each		\$4.00	5.00	6.00	8.00	10.00	.....
Price, to Offset 6 in. each		6.00	7.50	9.00	12.00	15.00	.....
Price, to Offset 8 in. each		8.00	10.00	12.00	16.00	20.00	.....



FIG. 75

SCREWED CAST IRON FITTINGS

Reducer



FIG. 76

Cap



FIG. 77

Locknut



FIG. 78

Size	inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Price, Reducers, Black..each		\$0.06	.09	.10	.16	.22	.28	.43	.60	.80	1.00
Price, Caps, Black.....each		.03	.03	.05	.08	.14	.20	.26	.40	.54	.75
Price, Locknuts, Black..each								.25	.27	.34	.47
Price, Locknuts, Galv...each									.54	.68	.94
Size	inches	4	$4\frac{1}{2}$	5	6	7	8	9	10	12	
Price, Reducers, Black..each		\$1.35	1.85	2.00	2.70	5.35	6.75	8.35	10.00	15.00	....
Price, Reducers, Galv...each		3.70	4.00	5.40	10.70	13.50	16.70	20.00	30.00	....	....
Price, Caps, Black.....each		.87	1.05	1.20	1.55	2.50	2.85	4.75	5.50	7.00	....
Price, Caps, Galv.....each		1.74	2.10	2.40	3.10	5.00	5.70	9.50	11.00	14.00	....
Price, Locknuts, Black—each		.64	.85	.90	1.30	1.70	2.35	2.70	3.00	4.00	....
Price, Locknuts, Galv...each		1.28	1.70	1.80	2.60	3.40	4.70	5.40	6.00	8.00	....

Bushing



FIG. 79

Plug



FIG. 80

Countersunk Plug



FIG. 81

Size	inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Bushings, Black..each				\$0.04	.04	.05	.06	.07	.09	.14	.21	.30
Price, Bushings, Galv...each				.08	.08	.10	.12	.14	.18	.28	.42	.60
Price, Plugs, Black.....each		\$0.02	.02	.02	.02	.03	.04	.05	.07	.10	.18	.25
Price, Plugs, Galv.....each			.04	.04	.04	.06	.08	.10	.14	.20	.36	.50
Price, Plugs Tapped for air cock.....each						.12	.15	.20	.25	.30	....	....
Price, L. H. Plugs.....each					.04	.06	.08	.09	.11	.15	....	....
Price, Solid Plugs.....each			.04	.04	.04	.06	.08	.09	.11	.15	.27	.38
Price, Plugs, Counters'k, ea.				.04	.04	.06	.08	.09	.11	.15	.30	.40
Size	inches	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	12	
Price, Bushings, Black..each		\$0.40	.50	.75	.93	1.25	1.87	2.75	3.25	3.75	5.00	....
Price, Bushings, Galv...each		.80	1.00	1.50	1.85	2.50	3.75	5.50	6.50	7.50	10.00	....
Price, Plugs, Black.....each		.38	.42	.65	.88	1.20	1.85	2.75	3.25	3.75	5.00	....
Price, Plugs, Galv.....each		.76	.84	1.30	1.75	2.40	3.70	5.50	6.50	7.50	10.00	....
Price, Plugs, Solid.....each		.57	.63	1.00	1.35	1.80	....	....	....	....	....	....
Price, Plugs, Counters'k, ea.		.92	1.10	....	2.00	3.50	....	....	....	....	....	....

SCREWED FLANGE UNIONS

FACED, NO GASKETS

Cast Iron



FIG. 82

Extra Heavy Cast Iron



FIG. 83

Malleable Iron



FIG. 84

STANDARD CAST IRON

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price.....each	\$0.40	.46	.52	.64	.78	1.00	1.25
Diameter of Flanges ..inches	3	$3\frac{1}{16}$	$3\frac{3}{8}$	$4\frac{1}{8}$	$4\frac{3}{8}$	$5\frac{1}{4}$	6
Number of Bolts	3	3	3	4	4	4	4

Size.....Inches	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7
Price.....each	\$1.50	1.80	2.10	2.70	3.15	3.95	5.50
Diameter of Flanges ..inches	$6\frac{3}{4}$	$6\frac{7}{8}$	$7\frac{5}{8}$	$8\frac{3}{4}$	$9\frac{9}{16}$	$10\frac{11}{16}$	12
Number of Bolts	4	4	5	5	5	6	7

Size.....Inches	8	9	10	12	14	15	16
Price.....each	\$7.00	10.00	11.50	16.00	28.00	35.00	60.00
Diameter of Flanges ..inches	$13\frac{3}{8}$	$14\frac{1}{4}$	16	$18\frac{1}{4}$	$20\frac{3}{8}$	$20\frac{3}{8}$	23
Number of Bolts	8	9	10	12	14	14	16

CAST IRON, EXTRA HEAVY, FOR 250 POUNDS
WORKING PRESSURE

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Price.....each	\$0.60	.70	.80	1.00	1.15	1.50	1.90	2.25	2.70
Diameter of Flanges ..inches	3	$3\frac{3}{4}$	$3\frac{5}{8}$	$4\frac{1}{8}$	$4\frac{5}{8}$	$5\frac{3}{8}$	6	$6\frac{3}{4}$	$7\frac{1}{2}$
Number of Bolts	3	4	4	4	4	5	5	6	6

Size.....Inches	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
Price	\$3.15	4.00	4.75	6.00	8.25	10.50	15.00	17.25	24.00
Diameter of Flanges ..inches	8	$8\frac{3}{4}$	$9\frac{3}{8}$	$10\frac{3}{8}$	12	$13\frac{1}{4}$	$14\frac{3}{8}$	$15\frac{3}{4}$	18
Number of Bolts	7	8	8	9	10	10	12	12	14

MALLEABLE IRON

Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price.....each	\$1.40	\$1.60	\$2.00	\$2.50	\$3.00	\$3.50	\$4.40
" Galvanized	2.80	3.20	4.00	5.00	6.00	7.00	8.80
Diameter of Flanges ..inches	$2\frac{7}{8}$	$3\frac{1}{4}$	$3\frac{3}{4}$	$4\frac{3}{8}$	$5\frac{1}{2}$	6	$6\frac{3}{4}$
Number of Bolts	3	4	4	4	4	4	4

Size.....Inches	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	8	.....
Price.....each	\$5.25	\$6.00	\$7.00	\$8.00	\$9.00	\$18.00	.....
" Galvanized	10.50	12.00	14.00	16.00	18.00	36.00	.....
Diameter of Flanges ..inches	$7\frac{1}{2}$	8	$8\frac{5}{8}$	$9\frac{3}{8}$	$10\frac{3}{8}$	$13\frac{3}{8}$	.....
Number of Bolts	4	5	5	5	6	7	.....

JEFFERSON FLANGE UNIONS

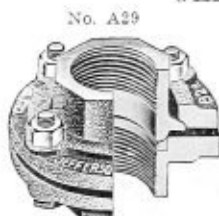


FIG. 35

The three-part flange union is far handier and much more economical to use than the old style gasket flange. The ground brass to iron joint makes a gasket unnecessary, and the time thus saved much more than offsets the difference in first cost. Being made of malleable iron will not break as cast iron flanges do, when pulling up. The movable collar eliminates all the trouble of bringing bolt holes in line, which is liable to break the flanges or rupture the pipe end in ordinary methods. The ball like construction of the joint makes it very flexible in all piping work. Recommended for steam, air or gas, wherever the pressure does not exceed 200 pounds.

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
No. A29, black	each	\$0.55	.60	.80	1.20	1.60	2.00	3.20	4.80	6.00
No. A29, galvanized	each	.75	.80	1.10	1.60	2.15	2.70	4.30	6.50	8.10
Size	inches	4	$4\frac{1}{2}$	5	6	7	8	9	10	
No. A29, black	each	\$7.50	8.75	10.00	12.50	15.00	18.00	21.60	28.80	
No. A29, galvanized	each	10.15	11.80	13.50	16.90	20.25	24.30	29.15	38.90	

DART FLANGE UNIONS

TWO BRONZE SEATS PREVENT CORROSION



FIG. 36

Absolutely tight joints assured whether in or out of Alignment.

Adapted for high or low pressure. Furnished with Bolts and Nuts.

Ten per cent Net Advance for Malleable Iron Flanges.

Thirty-five per cent Net Advance for Galvanized Flanges.

Prices for Extra Heavy Flanges on Request.

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Plain		\$0.55	.60	.80	1.20	1.60	2.00	3.20	4.80	6.00
Size	inches	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
Plain		\$7.50	8.75	10.00	12.50	15.00	18.00	21.60	28.80	46.00

Sectional View

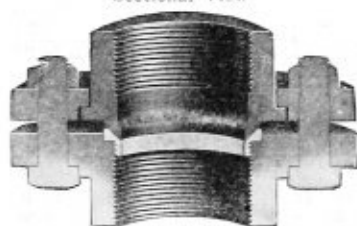


FIG. 37

"KEWANEE" FLANGE UNIONS

BRASS AND MALLEABLE IRON
SELF-SEATING BALL JOINT.
NO GASKET REQUIRED

Each union tested with air pressure under water. Suitable for steam pressures up to 125 pounds.

Size	inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Black	each	\$0.80	1.20	1.60	2.00	3.20	4.80	6.00	7.50
Galvanized	each	1.20	1.80	2.40	3.00	4.80	7.20	9.00	11.25
Size	inches	$4\frac{1}{2}$	5	6	7	8	9	10	
Black	each	\$8.75	10.00	12.50	15.00	18.00	21.60	28.80	
Galvanized	each	13.00	15.00	18.75	22.50	27.00	32.40	43.20	

CAST-IRON FLANGES

Common



FIG. 88

Floor



FIG. 89

Circular



FIG. 90

COMMON AND FLOOR FLANGES

Size, Inches	Price, Each	Size, Inches	Price, Each	Size, Inches	Price, Each	Size, Inches	Price, Each
$\frac{3}{8}$ x 3	\$0.10*	2 x 7	\$0.62	6 x 10	\$1.50	8 x 15	\$4.00
$\frac{1}{2}$ x $3\frac{1}{2}$	.15*	$2\frac{1}{2}$ x 7	.62	$4\frac{1}{2}$ x 11	1.75	9 x 15	4.00
$\frac{3}{4}$ x $3\frac{1}{2}$	.15*	3 x 7	.62	5 x 11	1.75	8 x 16	5.00
$\frac{3}{4}$ x 4	.22	3 x $7\frac{1}{2}$	.75	6 x 11	1.75	9 x 16	5.00
1 x 4	.16*	2 x 8	.90	5 x 12	2.20	10 x 16	5.00
$1\frac{1}{4}$ x $4\frac{1}{2}$	.25	$2\frac{1}{2}$ x 8	.90	6 x 12	2.20	9 x 17	5.75
$1\frac{1}{2}$ x $4\frac{1}{2}$	.22*	3 x 8	.90	7 x 12	2.20	10 x 17	5.75
$\frac{3}{4}$ x 5	.30	$3\frac{1}{2}$ x 8	.90	5 x $12\frac{1}{2}$	2.20	10 x 18	7.00
1 x 5	.30	4 x 8	.90	6 x $12\frac{1}{2}$	2.20	12 x 18	7.00
$1\frac{1}{4}$ x 5	.30	$3\frac{1}{2}$ x $8\frac{1}{2}$	1.00	7 x $12\frac{1}{2}$	2.20	10 x 19	7.50
$1\frac{1}{2}$ x 5	.30	4 x $8\frac{1}{2}$	1.00	6 x 13	2.80	12 x 19	7.50
2 x $5\frac{1}{2}$	.35*	3 x 9	1.15	7 x 13	2.80	12 x 20	8.50
1 x 6	.42	$3\frac{1}{2}$ x 9	1.15	8 x 13	2.80	14 x 20	8.50
$1\frac{1}{4}$ x 6	.40	4 x 9	1.15	6 x $13\frac{1}{2}$	2.80	14 x 21	9.50
$1\frac{1}{2}$ x 6	.40	$4\frac{1}{2}$ x 9	1.15	7 x $13\frac{1}{2}$	2.80	15 x 21	9.50
2 x 6	.42	$4\frac{1}{2}$ x $9\frac{1}{4}$	1.25	8 x $13\frac{1}{2}$	2.80	15 x $22\frac{1}{4}$	14.00
$2\frac{1}{2}$ x 6	.42	$3\frac{1}{2}$ x 10	1.50	6 x 14	3.25	16 x $23\frac{1}{2}$	18.00
2 x $6\frac{1}{2}$	.50	4 x 10	1.50	7 x 14	3.25	.....	.....
$2\frac{1}{2}$ x $6\frac{1}{2}$	.50	$4\frac{1}{2}$ x 10	1.50	8 x 14	3.25	.....	.....
3 x $6\frac{1}{2}$	.50	5 x 10	1.50	7 x 15	4.00	.....	.....

Those marked * are Floor Flanges, drilled for screw.

CIRCULAR FLANGES

Size of Pipe Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	5	6	7	8	9	10	12
Diam. of Flanges, inches	6	7	8	9	9	11	12	13	14	17	18	20

Circular flanges are made to order only. Prices on application.

When ordering give the circle flanges are to fit.

OVAL CAST-IRON FLANGES



FIG. 91

Size Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price each	\$0.18	.20	.22	.32	.36	.50	.70	.90	1.40	1.75

BOLTS EXTRA.

EXTRA HEAVY CAST IRON SCREWED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

Elbow



FIG. 92

45° Elbow



FIG. 93

These Fittings are Tested to Hydraulic Pressures Corresponding to the Above Working Pressure.

Tee



FIG. 94

Cross



FIG. 95

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Elbows	each	\$0.25	.30	.35	.45	.60	.75	1.25	2.00	2.75
Elbows, Reducing.....	each		.40	.45	.55	.75	.95	1.55	2.50	....
45° Elbows	each	.35	.40	.44	.55	.70	.90	1.50	2.50	3.50
Tees	each	.40	.45	.55	.70	.90	1.15	1.80	3.00	4.25
Tees, Reducing.....	each		.60	.70	.90	1.15	1.40	2.25	3.75	5.30
Crosses	each			.70	.90	1.20	1.50	2.50	4.00	5.50
Y Bends	each				1.35	1.80	2.25	3.75	6.00	....
Plugs	each	.04	.06	.08	.09	.11	.15	.27	.38	.57

Size	inches	4	$4\frac{1}{2}$	5	6	7	8	10	12
Elbows	each	\$3.50	4.25	5.50	8.00	12.00	17.00	28.00	40.00
Elbows, Reducing.....	each	4.40	....	6.80	....	....	....	....	....
45° Elbows	each	4.50	5.50	6.75	9.75	14.50	21.00	34.00	48.00
Tees	each	5.50	6.75	8.25	12.00	18.00	25.00	42.00	60.00
Tees, Reducing.....	each	6.85	8.50	10.25	15.00	22.50	31.00	52.00	75.00
Crosses	each	7.00	8.50	11.00	16.00	24.00	34.00	56.00	80.00
Y Bends	each	11.00	....	....	24.00	36.00	50.00	....	....
Plugs	each	.63	1.00	1.35	1.80	....	....	....	....

GALVANIZED EXTRA HEAVY FITTINGS DOUBLE ABOVE LIST

The radius of these Fittings is longer than the ordinary, thereby reducing friction.

We do not recommend the use of Screwed Fittings above 6 inch; for larger sizes, flanged are more suitable.

EXTRA HEAVY CAST STEEL SCREWED FITTINGS
FOR COLD WATER OR OIL WORKING PRESSURES AS FOLLOWS
 3 to 4½ inch, inclusive, up to 1,500 pounds; 5 and 6 inch up to 1,200 pounds.

Tested to Hydraulic Pressures Corresponding to the Above Pressures.

Elbows

45° Elbows

Tees



FIG. 96



FIG. 97



FIG. 98

Size	inches	3	3½	4	4½	5	6
Elbows	each	\$6.00	7.75	8.50	10.00	12.00	16.50
45° Elbows	each	6.00	7.75	8.50	10.00	12.00	16.50
Tees	each	9.00	11.50	12.75	15.00	18.00	25.00
Crosses	each	12.00	15.50	17.00	20.00	24.00	33.00

The radius of these Fittings is longer than the ordinary, thereby reducing friction.

EXTRA HEAVY HYDRAULIC FORGED STEEL
SCREWED FITTINGS

FOR COLD WATER OR OIL WORKING PRESSURES UP TO
3000 POUNDS HYDROSTATIC

For Superheated Steam Working Pressures Up to 350 Pounds and a Total Temperature of 800 Degrees Fahrenheit.

Tested to 3,000 Pounds Hydraulic Pressure.

Size	inches	½	¾	1	1¼	1½	2	2½
Elbows	each	\$1.40	1.50	1.60	1.75	2.10	2.50	4.00
Reducing Elbows	each	1.70	1.80	1.95	2.10	2.50	3.00	4.80
45° Elbows	each	1.40	1.50	1.60	1.75	2.10	2.50	4.00
Tees	each	2.10	2.25	2.40	2.65	3.15	3.75	6.00
Reducing Tees	each	2.50	2.75	3.00	3.25	3.75	4.50	7.00

DOUBLE EXTRA HEAVY HYDRAULIC FORGED
STEEL SCREWED FITTINGS

FOR COLD WATER OR OIL WORKING PRESSURES UP TO
6000 POUNDS HYDROSTATIC

Tested to 6,000 Pounds Hydraulic Pressure.

Size	inches	¾	1	1½	2			
Elbows	each	\$1.90	2.00	2.15	2.40	2.75	3.25	5.00
Reducing Elbows	each	2.40	2.60	2.90	3.30	3.90	6.00	
45° Elbows	each	2.00	2.15	2.40	2.75	3.25	5.00	
Tees	each	2.85	3.00	3.25	3.50	4.00	4.75	7.00
Reducing Tees	each	3.40	3.75	4.10	4.75	5.50	8.00	

WORKING PRESSURES

These Fittings are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures.

LONG SWEEP, CAST-IRON FITTINGS

Elbow



FIG. 99

Double Branch Elbow



FIG. 100

Size.....Inches	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Elbows.....each	\$0.32	\$0.40	\$0.55	\$0.80	\$1.20	\$2.25	\$3.25	\$3.50
Reducing elbows....."	.48	.60	.83	1.20	1.80	3.38	4.88	5.15
Double branch elbows....."	.64	.80	1.10	1.60	2.40	4.50	6.50	7.00
Reducing double branch elbs. "	.96	1.20	1.65	2.40	3.60	6.75	9.75	10.50

Size.....Inches	4 1/2	5	6	7	8	9	10	12
Elbows.....each	\$5.50	\$6.50	\$8.75	\$13.00	\$17.00	\$25.50	\$30.00	\$40.00
Reducing elbows....."	8.25	9.75	13.13	19.50	25.50	38.25	45.00	60.00
Double branch elbows....."	11.00	13.00	17.50	26.00	34.00	51.00	60.00	80.00
Reducing double branch elbs. "	16.50	19.50	26.25	39.00	51.00	76.50	90.00	120.00

Tee



FIG. 101

Cross



FIG. 102

Size.....Inches	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Tees.....each	\$0.48	\$0.60	\$0.82	\$1.20	\$1.80	\$3.40	\$4.90	\$5.25
Reducing tees....."	.72	.90	1.23	1.80	2.70	5.10	7.35	7.88
Crosses....."	.85	1.10	1.50	2.15	3.20	6.00	8.75	9.50
Reducing crosses....."	.....	1.65	2.25	3.23	4.80	9.00	13.13	14.25

Size.....Inches	4 1/2	5	6	7	8	9	10	12
Tees.....each	\$8.25	\$9.75	\$13.25	\$19.50	\$25.50	\$38.00	\$45.00	\$60.00
Reducing tees....."	12.38	14.63	19.88	29.25	38.25	57.00	67.50	90.00
Crosses....."	17.50	24.00	35.00	45.00	68.00	80.00	107.00	107.00
Reducing crosses....."	.....	26.25	36.00	52.50	67.50	102.00	120.00	160.50

Straight patterns furnished galvanized at double above lists.

CAST IRON DRAINAGE FITTINGS

SCREWED FOR WROUGHT PIPE

90° Elbow
Short Turn

FIG. 103

90° Elbow
Long Turn

FIG. 104

60° Elbow
Short Turn

FIG. 105

45° Elbow
Short Turn

FIG. 106

Size	inches	1 1/4	1 1/2	2	2 1/2	3	4	5	6	7	8	10
90° Short Turn, Black, each		\$0.30	.38	.57	1.20	1.45	2.30	4.25	6.25	11.50	15.00	31.00
90° Short Turn, Galv., each		.52	.67	1.00	2.10	2.55	4.00	7.40	11.00	20.00	26.25	54.00
90° Long Turn, Black, each		.35	.42	.65	1.40	1.75	2.75	5.25	7.50	13.50	19.00	38.00
90° Long Turn, Galv., each		.60	.72	1.15	2.45	3.10	4.80	9.20	12.15	23.50	33.25	66.50
60° Short Turn, Black, each		.30	.38	.57	1.20	1.45	2.30	4.25	6.25	11.50	15.00	31.00
60° Short Turn, Galv., each		.52	.67	1.00	2.10	2.55	4.00	7.40	11.00	20.00	26.25	54.00
45° Short Turn, Black, each		.30	.38	.57	1.20	1.45	2.30	4.25	6.25	11.50	15.00	31.00
45° Short Turn, Galv., each		.52	.67	1.00	2.10	2.55	4.00	7.40	11.00	20.00	26.25	54.00

The 90° Elbows are tapped, pitched 1/4 inch to the foot.

90° SHORT TURN ELBOWS

Size	inches	1 1/2 x 1 1/4	2 x 1 1/4
90° Short Turn, Black, each		\$0.57	.85
90° Short Turn, Galv., each		1.00	1.50

45° Elbow
Long Turn

FIG. 107

22 1/2° Elbow



FIG. 108

11 1/4° Elbow



FIG. 109

5 1/2° Elbow



FIG. 110

Size	inches	1 1/4	1 1/2	2	2 1/2	3	4	5	6	7	8	10
45° Long Turn, Black, each		\$0.35	.42	.65	1.40	1.75	2.75	5.25	7.50	13.50	19.00	38.00
45° Long Turn, Galv., each		.60	.72	1.15	2.45	3.10	4.80	9.20	13.15	23.50	33.25	66.50
22 1/2° Elbows, Black, each		.30	.38	.57	1.20	1.45	2.30	4.25	6.25	11.50	15.00	31.00
22 1/2° Elbows, Galv., each		.52	.67	1.00	2.10	2.55	4.00	7.40	11.00	20.00	26.25	54.00
11 1/4° Elbows, Black, each		.30	.38	.57	1.20	1.45	2.30	4.25	6.25	11.50	15.00	31.00
11 1/4° Elbows, Galv., each		.52	.67	1.00	2.10	2.55	4.00	7.40	11.00	20.00	26.25	54.00
5 1/2° Elbows, Black, each		.30	.38	.57	1.20	1.45	2.30	4.25	6.25	11.50	15.00	31.00
5 1/2° Elbows, Galv., each		.52	.67	1.00	2.10	2.55	4.00	7.40	11.00	20.00	26.25	54.00

CAST IRON DRAINAGE FITTINGS

SCREWED FOR WROUGHT IRON PIPE

45° Y Branch



FIG. 111

45° Reducing Y Branch



FIG. 112

45° Double Y Branch



FIG. 113

45° Y BRANCHES

Size inches	1 1/4	1 1/2	2	2 1/2	3	4	5	6	7	8	10
Price, Black.....each	\$0.52	.65	.95	2.10	2.65	3.85	7.10	10.50	19.00	25.00	52.00
Price, Galv.....each	.90	1.15	1.65	3.70	4.65	6.75	12.50	18.50	33.25	44.00	91.00

REDUCING 45° Y BRANCHES

Size inches	1 1/2x1 1/4	2x1 1/2	2 1/2x1 1/2	2 1/2x2	3x1 1/2	3x2	4x1 1/2	4x2	4x3	5x2
Price, Black.....each	\$0.72	1.05	2.30	2.30	2.90	2.90	4.25	4.25	4.25	7.80
Price, Galv.....each	1.25	1.85	4.00	4.00	5.10	5.10	7.40	7.40	7.40	13.65

Size inches	5x3	5x4	6x2	6x3	6x4	6x5	7x4	7x6	8x4	8x6	10x4	10x6	12x6
Price, Black, ea.	\$7.80	7.80	11.50	11.50	11.50	11.50	21.00	21.00	27.50	27.50	57.00	57.00	80.00
Price, Galv' ea.	13.65	13.65	20.00	20.00	20.00	20.00	37.00	37.00	48.00	48.00	97.00	97.00	140.00

REDUCING 45° DOUBLE Y BRANCHES

Size inches	1 1/2x1 1/4	2x1 1/2	2 1/2x1 1/2	3x2	4x2	5x2	6x2	6x4	7x6	8x4	8x6
Price, Black.....each	1.10	1.60	3.60	4.40	6.35	11.75	17.50	17.50	31.50	42.00	42.00
Price, Galv.....each	1.90	2.80	6.30	7.70	11.00	20.50	30.50	30.50	54.00	72.00	72.00

Tee



FIG. 114

TEES

Size inches	1 1/4	1 1/2	1 1/2x1 1/4	2	2x1 1/4	2x1 1/2	2 1/2	2 1/2x2	3	3x1 1/2
Price, Black, each	.45	.55	.60	.80	.90	.90	1.50	1.65	2.00	2.20
Price, Galv, each	.80	1.00	1.10	1.40	1.60	1.60	2.50	2.75	3.50	3.85

Size inches	3x2	4	4x2	4x3	5	5x2	5x3	5x4	6	7	8	10
Price, Black, each	2.24	3.25	3.60	3.60	6.00	6.60	6.60	6.60	8.75	16.00	21.00	43.00
Price, Galv, each	3.85	5.70	6.30	6.30	10.50	11.55	11.55	11.55	15.25	28.00	37.00	75.00

MALLEABLE IRON FITTINGS

CLASSIFICATION AND LIST

Adopted June 1, 1917.

Class	A	B	*C
Black, per pound.....	\$0.40	\$0.20	\$0.13
Galvanized, per pound.....	.50	.28	.20
Elbows	$\left\{ \begin{array}{l} \frac{1}{8} \times \frac{1}{8} \\ \frac{1}{4} \times \frac{1}{8} \\ \frac{3}{8} \times \frac{1}{8} \end{array} \right\}$	$\left\{ \begin{array}{l} \frac{3}{8} \times \frac{1}{4} \\ \frac{1}{2} \times \frac{1}{4} \\ \frac{1}{4}, \frac{3}{8}, \frac{1}{2} \\ \frac{1}{2} \times \frac{3}{8} \end{array} \right\}$	$\frac{3}{4}$ and larger
Elbows, R. & L.....	$\frac{1}{4}, \frac{3}{8}$	$\frac{1}{2}, \frac{3}{4}, 1$	$1\frac{1}{4}$ and larger
Elbows, 45°, 60°, 22½°, 11¼°...	$\frac{1}{8}$	$\frac{1}{4}$ to 2 inclusive	$2\frac{1}{2}$ and larger
Elbows, Street	$\frac{1}{8}$	$\frac{1}{4}$ to $1\frac{1}{4}$ inclusive	1 and larger
Elbows, Street, 45°	$\frac{3}{8}$	$\frac{1}{2}$ to 2 inclusive	
Elbows, Side Outlet.....		all sizes	
Elbows, Drop		all sizes	
Tees	$\left\{ \begin{array}{l} \frac{1}{8} \times \frac{1}{8} \\ \frac{1}{8} \times \frac{1}{4} \\ \frac{1}{4} \times \frac{1}{8} \\ \frac{3}{8} \times \frac{1}{8} \\ \frac{1}{4} \times \frac{1}{8} \times \frac{1}{8} \end{array} \right\}$	$\left\{ \begin{array}{l} \frac{1}{4}, \frac{3}{8}, \frac{1}{2} \\ \frac{1}{4} \times \frac{3}{8} \\ \frac{3}{8} \times \frac{1}{4} \times \frac{1}{4} \\ \frac{3}{8} \times \frac{3}{8} \times \frac{1}{4} \\ \frac{3}{8} \times \frac{1}{4} \times \frac{3}{8} \\ \frac{1}{2} \text{ reducing} \end{array} \right\}$	$\frac{3}{4}$ and larger
Tees, Four Way		all sizes	
Tees, Drop		all sizes	
Tees, Service		$\left\{ \begin{array}{l} \frac{3}{8}, \frac{1}{2}, \frac{3}{4} \\ \frac{3}{4} \times \frac{1}{2} \times \frac{3}{4} \\ 1 \times \frac{3}{4} \times \frac{3}{4} \\ 1 \times 1 \times \frac{3}{4} \\ 1 \times \frac{3}{4} \times 1 \end{array} \right\}$	1 and larger
Tees, Service, Male Branch....		$1 \times 1 \times \frac{3}{4}$	1 and larger
Crosses	$\frac{1}{8}$	$\frac{1}{4}$ to 1 inclusive	$1\frac{1}{4}$ and larger
Crosses, Reducing		1 and smaller	$1\frac{1}{4}$ and larger
Return Bends		$\frac{3}{8}$ to 1 inclusive	$1\frac{1}{4}$ and larger
Return Bends, R. & L.....	$\frac{3}{8}, \frac{1}{2}$	$\frac{3}{4}$ and larger	
Couplings, R. H.....	$\frac{1}{8}$	$\frac{1}{4}$ to $\frac{3}{4}$ inclusive	1 and larger
Couplings, R. & L.....		$\frac{1}{4}$ to $\frac{3}{4}$ inclusive	1 and larger
Reducers	$\left\{ \begin{array}{l} \frac{1}{4} \times \frac{1}{8} \\ \frac{3}{8} \times \frac{1}{8} \end{array} \right\}$	$\left\{ \begin{array}{l} \frac{3}{8} \times \frac{1}{4} \text{ to } \\ 1 \times \frac{1}{4} \text{ inclusive} \end{array} \right\}$	$1\frac{1}{4}$ and larger
Caps	$\frac{1}{8}$	$\frac{1}{4}$ to 1 inclusive	$1\frac{1}{4}$ and larger
Lock Nuts	$\frac{1}{8}$	$\frac{1}{4}$ to $1\frac{1}{4}$ inclusive	$1\frac{1}{2}$ and larger
Extension Pieces		all sizes	
Waste Nuts		all sizes	
Chandelier Hooks		all sizes	
Chandelier Loops		all sizes	
Wall Plates		all sizes	
Y Branches, 45°, 60°, Double....		all sizes	
Standard Parallel Y Branches....		all sizes	

*Fittings in Class C having one or more openings smaller than $\frac{3}{4}$ to be Class B.

The run of tees gives the sizes for the purpose of classification; the outlet being larger does not change it.

In ordering, be particular to state whether beaded or plain.

An extra charge will be made for fittings not enumerated in standard list.

MALLEABLE IRON FITTINGS

Beaded Elbow



FIG. 115

45° Beaded Elbow



FIG. 116

60° Plain Elbow



FIG. 117

STRAIGHT AND REDUCING ELBOWS

Size . . . in.	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6
Black .ea.	\$0.06	.07	.08	.10	.15	.25	.25	.35	.50	.90	1.50	2.25	3.00	3.50	4.00	6.50
Gal. .ea.	\$0.08	.09	.11	.14	.20	.32	.40	.60	.90	1.50	2.60	3.75	5.00	....	6.50	10.00

RIGHT AND LEFT ELBOWS

Size inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
Black each	\$0.09	.11	.13	.17	.25	.30	.40	.65
Galvanized each	\$0.12	.16	.17	.23	.35	.45	.65	1.00

45° AND 60° ELBOWS

Size in.	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6
45° elbows, blk. .ea.	\$0.08	.10	.12	.18	.26	.36	.54	.82	1.25	2.50	3.25	4.50	5.25	6.00	7.50
45° elbows, gal. .ea.	\$0.12	.15	.20	.25	.40	.50	.85	1.35	1.90	3.75	4.75	6.75	....	9.00	11.00
60° elbows, blk. .ea.	....	....	....	....	.30	.45	.65	....	....	....	....	....	....	....	....
60° elbows, gal. .ea.	....	....	....	....	.45	.70	1.05	....	....	....	....	....	....	....	....

Street Elbow



FIG. 118

Side Outlet Elbow



FIG. 119

Drop, Female Elbow



FIG. 120

STREET ELBOWS

Size inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
Street elbows, black each	\$0.10	.10	.12	.20	.25	.40	.55	.90	1.50	2.25	3.50
Street elbows, galvanized each	\$0.12	.12	.15	.28	.35	.55	.80	1.30	2.25	3.50	....
Street elbows, 45° black each	....	\$0.12	.12	.20	.25	.40	.55	.90	....	2.25	3.50
Street elbows, 45° galvanized each	....	\$0.15	.15	.28	.35	.55	.80	1.30	....	....	....

SIDE OUTLET ELBOWS

Size inches	3/8	1/2	3/4	1	1 1/4	1 1/2	2
Black each	\$0.08	.10	.18	.30	.45	.65	.90
Galvanized each	\$0.10	.15	.25	.45	.65	.90	1.50

DROP ELBOWS

LONG DROP ELBOWS

Size inches	1/4	3/8	1/2	3/4	Size inches	1/4 x 3/8	3/4 x 3/8	1/2 x 3/8	1/2 x 1/2
Female, black ea.	\$0.06	.08	.12	.20	Black ea.	\$0.10	.10	.18	.18
Female, gal. ea.	....	\$0.12	.20	.35	Gal ea.	\$0.18	.18	.27	.27
Male and female, ea.	....	\$0.08	.12	....	Drop length . . . in.	2 3/8	2 1/2	3 1/8	3 1/8
Male and female, gal. ea.	....	\$0.12	.20	....					

MALLEABLE IRON FITTINGS

Beaded Tee



FIG. 121

Plain Tee



FIG. 122

Service Tee



FIG. 123

STRAIGHT AND REDUCING TEE

Size.....inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6
Black..... each	\$0.07	.08	.09	.11	.15	.25	.30	.45	.60	1.05	1.70	2.50	3.40	4.25	5.00	7.75
Galvanized.....each	\$0.09	.10	.13	.16	.20	.38	.50	.70	1.00	1.90	3.00	4.25	5.75	....	8.00	12.00

SERVICE TEE

Size.....inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
Black.....each	\$0.12	.15	.25	.35	.50	.75	1.15	2.00	2.50	3.50	4.50	5.50	7.50
Galvanized.....each	\$0.15	.20	.35	.50	.70	1.10	1.65	....	....	....	....	....	....

Four-Way Tee



FIG. 124

Drop Tee



FIG. 125

Beaded Cross



FIG. 126

Plain Cross



FIG. 127

FOUR-WAY AND DROP TEES

Size.....inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Four-way tees, black.....each	\$0.12	.14	.20	.35	.50	.80	1.25
Four-way tees, galvanized.....each	\$0.17	.20	.28	.50	.70	1.10	1.75
Drop tees, black.....each	\$0.10	.14	.22	.30	....	....	....
Drop tees, galvanized.....each	\$0.15	.25	.40	....	....	....	....
Male and female, black.....each	\$0.10	.14	.22	.30	....	....	....
Male and female, galvanized.....each	\$0.15	.25	.40	....	....	....	....

LONG DROP TEES

Size.....inches	$\frac{1}{4}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
Black.....each	\$0.12	.14	.25	.29	.45	.60	.90	1.00	1.75	3.00	3.25	5.25	7.50	13.00
Galvanized.....each	\$0.17	.20	.35	.50	.70	1.10	1.65	....	....	....	....	....	....	....

STRAIGHT AND REDUCING CROSSES

Size.....inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
Black.....each	\$0.09	.10	.16	.20	.30	.40	.60	1.00	1.75	3.00	3.25	5.25	7.50	13.00
Galvanized.....each	\$0.12	.14	.25	.29	.45	.60	.90	1.50	2.75	4.50	....	8.00	....	....

MALLEABLE IRON FITTINGS

Y Branch



FIG. 128

Cross-Over



FIG. 129

Cross-Over Tee



FIG. 130

Y BRANCHES, STRAIGHT AND REDUCING

Size.....inches	$\frac{1}{8}$	$\frac{3}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4
Black.....each	\$0.40	.50	.60	.80	1.00	1.70	2.00	4.00	5.50
Galvanized.....each	\$0.60	.75	.90	1.25	1.50	2.50	3.00	6.00	8.25

60° Y BRANCHES

CROSS-OVERS

CROSS-OVER TEES

Size.....inches	2	$2\frac{1}{2}$	Size.....inches	$\frac{1}{8}$	$\frac{3}{8}$	1	Size.....inches	$\frac{1}{8}$	$\frac{3}{4}$
Black.....each	\$1.70	1.70	Black.....each	\$0.20	.30	.45	Black.....each	.....	.....
Galvan'd..each	\$2.50	2.50	Galvan'd..each	\$0.25	.40	.60	Galvan'd..each	\$0.38	.56

R. H. Coupling



FIG. 131

R. & L. Coupling



FIG. 132

Reducing Coupling



FIG. 133

Cap



FIG. 134

RIGHT HAND COUPLINGS

Size.....inches	$\frac{3}{4}$	$\frac{5}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Black.....each	\$0.03	.05	.07	.10	.14	.20	.25	.35	.60	.90
Galvanized...each	\$0.05	.07	.10	.17	.23	.30	.40	.55	.95	1.40

RIGHT AND LEFT COUPLINGS

Size.....inches	$\frac{3}{4}$	$\frac{5}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Black.....each	\$0.04	.06	.08	.12	.16	.25	.36	.52	.70	1.00
Galvanized...each	\$0.06	.09	.10	.17	.25	.35	.55	.75	1.05	1.50

REDUCING COUPLINGS

Size.....inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Black.....each	\$0.05	.06	.07	.10	.16	.20	.28	.45	.70	1.00	1.50	1.85
Galvanized...each	\$0.08	.10	.10	.15	.25	.35	.45	.75	1.05	1.65	2.40	3.05

CAPS

Size.....inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
Black...each	\$0.03	.04	.05	.08	.12	.16	.24	.32	.45	.85	1.00	1.20	2.50	3.50
Galv'd..each	\$0.04	.05	.08	.12	.17	.24	.38	.52	.76	1.30	1.60	2.00	.....	.....

MALLEABLE IRON FITTINGS

Bushing



FIG. 135

Faced Bushing



FIG. 136

Locknut



FIG. 137

Faced Locknut



FIG. 138

BUSHINGS—REDUCING ONE SIZE ONLY

Size.....inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Black.....each	\$0.04	.04	.04	.05	.06	.07	.09	.14	.21
Galvanized.....each	\$0.08	.08	.08	.10	.12	.14	.18	.28	.42

FACED BUSHINGS

Size...inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6
Black...each	\$0.08	.09	.11	.13	.17	.22	.32	.48	.70	1.20	1.50	2.10	2.60	3.75
Galv....each	\$0.20	.25	.33	.48	.72	1.05	1.80	2.25	.....	.....	.....	.....	.....	.....

LOCKNUTS

Size.....inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Black.....each	\$0.02	.03	.04	.05	.07	.09	.11	.18
Galvanized.....each	\$0.03	.04	.05	.07	.10	.14	.20	.30

FACED LOCKNUTS

Size.....inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Black.....each	\$0.08	.09	.10	.12	.15	.20	.25	.30	.35	.45
Galvanized.....each	\$0.11	.13	.15	.18	.22	.30	.35	.45	.50	.65

Extension Piece



FIG. 139

Hexagon Nipple



FIG. 140

Waste Nut



FIG. 141

EXTENSION PIECES

Size.....inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
Black.....each	\$0.06	.09	.12
Galvanized.....each	\$0.09	.13	.18

HEXAGON NIPPLES, RIGHT AND LEFT

Size.....inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Black.....each	\$0.20	.20	.20	.25	.30	.40	.50	.70	1.10	1.50	1.90	2.40

Right-hand hexagon nipples made to order at a special price.

WASTE NUTS

Size.....inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Black.....each	\$0.04	.05	.06	.08	.10	.15	.25
Galvanized.....each	\$0.08	.10	.12	.16	.20	.30	.50

MALLEABLE IRON FITTINGS

Close Pattern



FIG. 142

Medium Pattern



FIG. 143

CLOSE PATTERN RETURN BENDS

Size.....inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Center to center.....inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{1}{8}$	$2\frac{3}{8}$
Price, R. H., black.....each	\$0.18	.25	.35	.50	.75	1.00
Price, R. H., galvanized.....each	\$0.25	.35	.55	.75	1.15	1.65
Price, R. and L., black.....each	\$0.23	.30	.45	.60	.90	1.25
Price, R. and L., galvanized.....each	\$0.35	.40	.65	.85	1.30	1.90
Price, L. H., black.....each	\$0.23	.30	.45	.60	.90	1.25

MEDIUM PATTERN RETURN BENDS

Size.....inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Center to center.....inches	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{1}{4}$	$2\frac{3}{8}$	3
Price, R. H., black.....each	\$0.18	.25	.35	.50	.75	1.00
Price, R. H., galvanized.....each	\$0.25	.35	.55	.75	1.15	1.65
Price, R. and L., black.....each	\$0.23	.30	.45	.60	.90	1.25
Price, R. and L., galvanized.....each	\$0.40	.65	.85	1.30	1.90	2.75
Price, L. H., black.....each	\$0.23	.30	.45	.60	.90	1.25

Open Pattern



FIG. 144

Special Wide Pattern



FIG. 145

OPEN PATTERN RETURN BENDS

Size.....inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Center to center.....inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5
Price, R. H., black.....each	\$0.20	.30	.50	.65	.85	1.25	2.00	3.00
Price, R. H., galvanized.....each	\$0.28	.45	.70	.90	1.25	2.00	3.50	5.00
Price, R. and L., black.....each	\$0.25	.38	.60	.80	1.05	1.55	2.50	3.75
Price, R. and L., galvanized.....each	\$0.55	.80	1.05	1.50	2.40	3.75	5.00	7.50
Price, L. H., black.....each	\$0.25	.38	.60	.80	1.05	1.55	2.50	3.75

SPECIAL WIDE PATTERN RIGHT-HAND RETURN BENDS

Size.....inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	3	4	6
Center to center.....inches	$1\frac{1}{8}$	4	6	6	6	5	$7\frac{1}{8}$	8	6	12
Price, black.....each	\$0.25	1.00	1.25	1.25	2.00	3.00	6.00	5.00	8.00	16.00
Price, galvanized.....each	\$0.30	1.35	1.65	1.70	2.75	4.00	6.50	6.50	.....	.....

EXTRA HEAVY RETURN BENDS

Size.....inches	1	1	1	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$	2	2	2
Center to center.....inches	$1\frac{3}{4}$	$2\frac{1}{4}$	3	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	6	3	3	$3\frac{1}{2}$
Price, black.....each	\$0.60	.75	.85	.90	.95	1.00	1.15	1.20	1.55	1.15	1.25	1.30
Price, galvanized.....each	\$0.60	.75	.85	.90	.95	1.00	1.15	1.20	1.55	1.15	1.25	1.30

EXTRA HEAVY MALLEABLE IRON FITTINGS FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

Elbow



FIG. 146

Elbow



FIG. 147

Tee



FIG. 148

Tee



FIG. 149

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Elbows	each	\$0.20	.25	.30	.35	.40	.55	.70	.90	1.50
45° Elbows	each	.25	.30	.35	.42	.50	.65	.85	1.10	1.85
Long Sweep Elbows	each	.....	.....	.....	.....	.64	.80	1.10	1.60	2.40
Tees	each	.30	.40	.45	.50	.60	.80	1.05	1.35	2.25
Crosses	each	.60	.80	.90	1.00	1.20	1.60	2.10	2.70	4.50
Reducers	each	.....	.....	.28	.30	.40	.45	.55	.70	1.30

Size	inches	3	$3\frac{1}{2}$	4	5	6	8	10	12	
Elbows	each	\$2.40	3.25	4.25	6.50	9.50	21.00	37.00	60.00	.....
45° Elbows	each	2.85	4.00	5.00	7.50	10.50	.....	.....	.....	.....
Long Sweep Elbows	each	4.50	6.50	7.00	13.00	17.00	.....	.....	.....	.....
Tees	each	3.60	5.00	6.50	9.75	14.25	32.00	55.00	90.00	.....
Crosses	each	7.20	10.00	13.00	19.50	28.50	.....	.....	.....	.....
Reducers	each	12.25	.....	.....	.....	.....	.....	.....	.....	.....

EXTRA HEAVY HYDRAULIC MALLEABLE IRON FITTINGS

For cold water or oil working pressures as follows:

One inch and smaller, 2,000 lbs. hydrostatic; $1\frac{1}{4}$ to 2 inch, 1,500 lbs. hydrostatic; $2\frac{1}{2}$ to 4 inch, 1,000 lbs. hydrostatic; 5 and 6 inch, 800 lbs. hydrostatic; 8 inch, 600 lbs. hydrostatic; 10 and 12 inch, 500 lbs. hydrostatic.

When these fittings are used on pipe lines subject to shock, sizes 6 inch and smaller are good for 500 pounds working pressure and sizes 8 to 12 inch, inclusive, for 400 pounds.

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Elbows, No. 260 H.	each	\$0.20	.25	.30	.35	.40	.55	.70	.90	1.50	2.40
45° Elbows, No. 262 H.	each	.25	.30	.35	.42	.50	.65	.85	1.10	1.85	2.85
L. S. Elbows, No. 263 H.	each	.....	.....	.....	.....	.64	.80	1.10	1.60	2.40	4.50
Tees, No. 264 H.	each	.30	.40	.45	.50	.60	.80	1.05	1.35	2.25	3.60
Crosses, No. 266 H.	each	.60	.80	.90	1.00	1.20	1.60	2.10	2.70	4.50	7.20
Reducers, No. 267 H.	each	.....	.....	.....	.30	.40	.45	.55	.70	.....	.....

Size	inches	$3\frac{1}{2}$	4	5	6	8	10	12
Elbows, No. 260 H.	each	\$ 3.25	4.25	6.50	9.50	21.00	37.00	60.00
45° Elbows, No. 262 H.	each	4.00	5.00	7.50	10.50	.....	.....	.....
L. S. Elbows, No. 263 H.	each	6.50	7.00	13.00	17.50	.....	.....	.....
Tees, No. 264 H.	each	5.00	6.50	9.75	14.25	32.00	55.00	90.00
Crosses, No. 266 H.	each	10.00	13.00	19.50	28.50	.....	.....	.....

WORKING PRESSURES

These Fittings are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures.

Long Sweep Elbows, 45° Elbows and Crosses are not carried in stock in Reducing Sizes, but will be made to order by bushing in the sand from the straight patterns, at a special price, according to quantity wanted.

Reducing Elbows and Tees carried in stock, furnished at same price as straight sizes.

MALLEABLE IRON UNIONS

Standard



FIG. 150

Kewanee



FIG. 151

Dart



FIG. 152

Jefferson



FIG. 153

PRICE EACH

Size .....inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Standard, black.....	\$0.18	.18	.20	.22	.27	.33	.46	.58	.75	1.55	2.10	3.60	4.35
Standard, galv.....	.27	.27	.30	.33	.40	.50	.70	.90	1.15	2.35	3.15	5.50	6.50
Kewanee, black.....	.18	.19	.22	.27	.40	.48	.66	.80	1.14	2.10	2.65	4.30	5.50
Kewanee, galv.....	.22	.23	.26	.34	.49	.60	.82	1.10	1.40	2.75	3.50	6.30	7.50
Dart, black.....	.30	.30	.40	.50	.60	.80	1.20	1.60	2.00	3.20	4.80	7.20	10.80
Dart, galv.....	.45	.45	.60	.75	.90	1.20	1.80	2.40	3.00	4.80	6.20	10.80	16.20
Jefferson, black.....	.30	.30	.40	.50	.60	.80	1.20	1.60	2.00	3.20	4.80	8.00	10.00
Jefferson, galv.....	.45	.45	.60	.75	.90	1.20	1.80	2.40	3.00	4.80	7.20	12.00	15.00

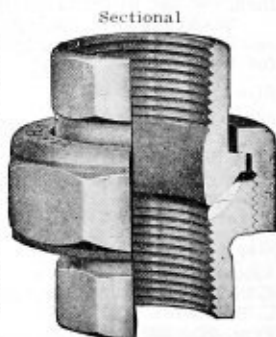
MARK COLD DRAWN STEEL UNION



FIG. 154

The Mark Cold Drawn Steel Unions are made from heavier steel than the corresponding sizes of pipe on which they are used.

The ends and nut are octagonal in form, which gives a firm, easy grip for the wrench and facilitates the handling of the union in cramped places.



It is the only union suitable for varying temperatures and pressures.

Brass seat ring fused into place--cannot become loose through expansion and contraction.

All surfaces, including all the threads, protected against rust and corrosion.

Size .....inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price .....each	\$0.30	.30	.40	.50	.60	.80	1.20	1.60	2.00	3.20	4.80

MALLEABLE IRON BRASS TO IRON SEAT UNIONS

Malleable Ends.

Malleable Hexagon Ring

These brass to iron seat unions have been examined and tested by the Underwriters' Laboratories and listed by the consulting engineers of the National Board of Fire Underwriters.

No. 519
Female Ends



FIG. 155

**CRANE RAILROAD UNIONS
NO. 519. FOR STEAM WORKING PRESSURES UP TO 250 POUNDS**

Tested to 250 pounds hydraulic pressure

Sizes	inches	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Price	each	\$0.30	.40	.50	.60	.80
Price, Galvanized	each	.45	.60	.75	.90	1.20
Sizes	inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price	each	\$1.20	1.60	2.00	3.20	4.80
Price, Galvanized	each	1.80	2.40	3.00	4.80	6.20

No. 519½
Male and Female Ends

NO. 519½. FOR STEAM WORKING PRESSURES UP TO 200 POUNDS

Tested to 250 pounds hydraulic pressure.

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Price	each	\$0.38	.50	.62	.75	1.00
Price, Galvanized	each	.53	.70	.87	1.05	1.40
Size	inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price	each	\$1.50	2.00	2.50	4.00	6.00
Price, Galvanized	each	2.10	2.80	3.50	5.60	8.40

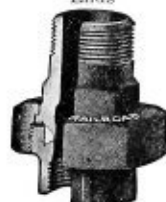


FIG. 156

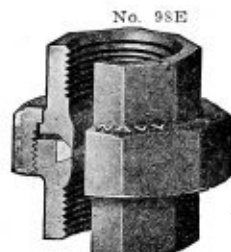


FIG. 156A

**MALLEABLE IRON UNIONS
NAVY-OCTAGON ENDS**

GROUND JOINT BRASS TO IRON SEAT
NO GASKET REQUIRED
EXTRA HEAVY

For Steam Working Pressures as follows:

 $\frac{1}{4}$ to 2 inch, inclusive, 300 pounds $2\frac{1}{2}$ and 3 inch, 250 pounds

Tested to 300 pounds hydraulic pressure

Crane Navy Unions with brass to iron seat have been examined and tested by the Underwriters' Laboratories and listed by the Consulting Engineers of the National Board of Fire Underwriters.

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Price	each	\$0.30	.40	.50	.60	.80
Price, Galvanized	each	.45	.60	.75	.90	1.20
Size	inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price	each	\$1.20	1.60	2.00	3.20	4.80
Price, Galvanized	each	1.80	2.40	3.00	4.80	6.20

These Unions have been re-designed and improved and are now furnished with octagon ends.

These are excellent Unions for severe service as all parts are of heavy construction.

The brass ring is forced into place by special machinery and cannot loosen.

The seats are ground in, so that a tight joint is obtained.

The brass to iron seat eliminates the use of gaskets, and causes less trouble in making up pipe lines. New Unions are not needed when a joint is broken as the brass to iron seat makes it possible to use them again and again.

Brass to brass seats will be made to order at special price.

MALLEABLE IRON RAILROAD UNION ELBOWS

BRASS TO IRON SEAT

Ground Joint
Non-Corrosive

No Gasket Required
Readily Taken Apart

For Steam Working Pressures up to 200 Pounds

Tested to 250 Pounds Hydraulic Pressure.

Our brass to iron seat Railroad Union Elbows have been examined and tested by the Underwriters' Laboratories and listed by the Consulting Engineers of the National Board of Fire Underwriters.

No. 590. Elbow With Female Union



FIG. 157

No. 592. Elbow With Male Union



FIG. 158

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price, No. 590, Elbow	each	\$0.45	.60	.75	.90	1.20	1.80	2.40	3.00	4.80
Price, No. 590, Galvanized	each	.60	.80	1.00	1.20	1.60	2.40	3.20	4.00	6.40
Price, No. 592, Elbow	each	.45	.60	.75	.90	1.20	1.80	2.40	3.00	4.80
Price, No. 592, Galvanized	each	.60	.80	1.00	1.20	1.60	2.40	3.20	4.00	6.40

No. 594. Tee With Female Union



FIG. 159

No. 596. Tee With Male Union



FIG. 160

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price, No. 594, Tee	each	\$0.50	.66	.82	.99	1.32	1.98	2.64	3.30	5.30
Price, No. 594, Galvanized	each	.67	.88	1.10	1.32	1.75	2.65	3.50	4.40	7.10
Price, No. 596, Tee	each	.50	.66	.82	.99	1.32	1.98	2.64	3.30	5.30
Price, No. 596, Galvanized	each	.67	.88	1.10	1.32	1.75	2.65	3.50	4.40	7.10

MALLEABLE IRON UNION ELBOWS AND TEES

FOR STEAM WORKING PRESSURES UP TO 150 POUNDS

Gaskets extra.

ELBOWS

Elbow
With Female Union

FIG. 160A

Elbow
With Male Union

FIG. 160B

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price, with Female Union.....each		\$0.38	.40	.42	.54	.63	.90	1.05	1.55	2.85
Price, with Female Union, Galv.....each		.57	.60	.63	.81	.95	1.35	1.58	2.35	4.30
Price, with Male Union.....each		.43	.45	.48	.62	.72	1.05	1.20	1.80	3.30
Price, with Male Union, Galv.....each		.65	.70	.72	.93	1.08	1.60	1.80	2.70	4.95

TEES

Tee
With Female Union

FIG. 160C

Tee
With Male Union

FIG. 160D

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price, with Female Union.....each		\$0.40	.43	.45	.57	.70	.95	1.15	1.70	3.20
Price, with Female Union, Galv.....each		.60	.65	.68	.86	1.05	1.45	1.75	2.55	4.80
Price, with Male Union.....each		.48	.50	.52	.65	.80	1.10	1.30	1.95	3.70
Price, with Male Union, Galv.....each		.72	.75	.78	1.00	1.20	1.65	1.95	2.95	5.55

"KEWANEE" UNION ELLS

"KEWANEE" COMBINATION BRASS AND IRON GROUND BALL JOINT NON-CORROSIVE THREAD CONNECTION. EACH FITTING TESTED WITH EXTREME AIR PRESSURE UNDER WATER. NO GASKET REQUIRED

With Female Union

**FIG. 161**

With Male Union

**FIG. 162**

Sizes	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Female union	each	\$0.25	\$0.45	\$0.65	\$0.85	\$1.00	\$1.35	\$1.60	\$2.35	\$4.30
Galvanized	each	.35	.50	1.00	1.25	1.50	2.00	2.40	3.50	6.45
Male union	each	.30	.50	.75	.95	1.10	1.60	1.80	2.70	5.00
Galvanized	each	.40	.65	1.10	1.40	1.65	2.40	2.70	4.00	7.50

When not specified male or female, female always sent.

In many cases when an elbow or tee is used, it is necessary to place a union near it.

The combination fittings shown renders the use of a separate union and nipple unnecessary. The reduction in the number of joints lessens the liability of leakage, saves time and trouble, and makes it possible to work in close quarters when necessary.

"KEWANEE" UNION TEES

"KEWANEE" COMBINATION BRASS AND IRON GROUND BALL JOINT NON-CORROSIVE THREAD CONNECTION. EACH FITTING TESTED WITH EXTREME AIR PRESSURE UNDER WATER. NO GASKET REQUIRED

With Female Union

**FIG. 163**

With Male Union

**FIG. 164**

Sizes	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Female union	each	\$0.30	\$0.50	\$0.70	\$0.90	\$1.05	\$1.45	\$1.75	\$2.55	\$4.80
Galvanized	each	.40	.65	1.05	1.30	1.60	2.20	2.65	3.90	7.20
Male union	each	.35	.55	.80	1.00	1.20	1.65	1.95	2.95	5.60
Galvanized	each	.45	.75	1.20	1.50	1.80	2.50	3.00	4.45	8.50

When not specified male or female, female always furnished.

One male Kewanee union ell or tee replaces four ordinary fittings. This is recognized as one of the most valuable innovations brought out in recent years.

CIRCULATING BOILER FITTINGS

MALLEABLE IRON GALVANIZED

Old Pattern
No. 585

FIG. 165

New Pattern
No. 586

FIG. 166

No. 587



FIG. 167

No. 588



FIG. 168

No. 589



FIG. 169

Size	inches	Female, Male	Female, Male	Female, Male
Boiler Elbows, Gal.	each	$\frac{3}{4} \times \frac{3}{4} \times 1$	$\frac{3}{4} \times \frac{1}{2} \times 1$	$\frac{1}{2} \times \frac{1}{2} \times 1$
Boiler Elbows, with Union, Galv.	each	.40	.40	.40
Boiler Coupling, Galv.	each	.40	.40	.40
Boiler Coupling, with Union, Galv.	each	.75	.75	.60

In ordering always specify whether "old pattern" or "new pattern" Union Elbow is required. Unless otherwise specified "old pattern" Union Elbows will be furnished.

BRASS STEAMBOAT AND
BARGE FITTINGS

Syphon Coupling



FIG. 170

Three-Way Swing

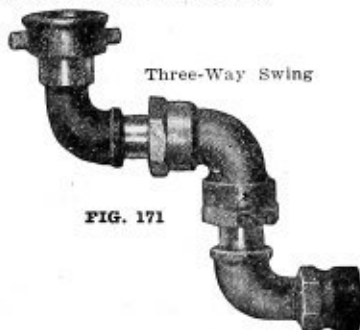


FIG. 171

Goose Neck

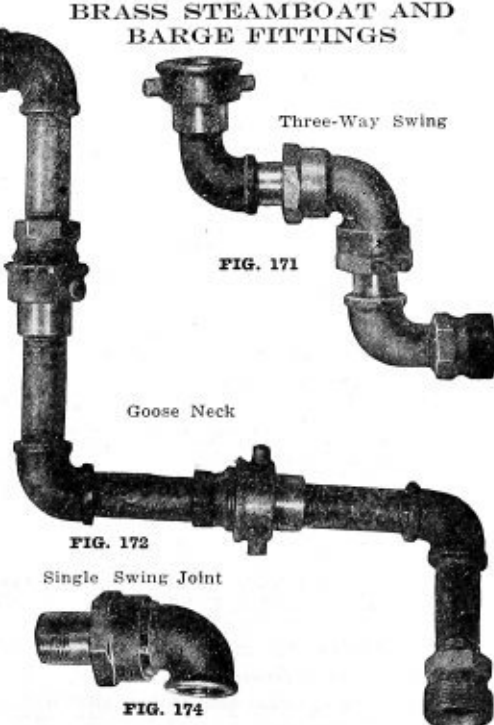


FIG. 172

Double Swing
Joint

FIG. 173

Single Swing Joint



FIG. 174

These fittings are used to convey steam to pumps on barges and towboats. Can be furnished in sizes 1, 1 $\frac{1}{4}$, 1 $\frac{1}{2}$ and 2 inches from back. Sizes 2 $\frac{1}{2}$, 3 and 4 inch to order. Prices upon application.

MORAN FLEXIBLE JOINTS

FOR STEAM, AIR AND GAS

No. 1

Loose Until
Pressure is Applied

FIG. 175

No. 2



FIG. 176

FOR LIQUIDS

No. 3

Adjustable and Detachable
Without the Use of Tools

FIG. 177

The Moran Flexible Joint is adapted to almost every conceivable purpose requiring a flexible conveyor of steam, air, gas or liquids under any desired pressure or conditions.

ADVANTAGES OF THE MORAN FLEXIBLE JOINT

Only three parts, all metal.

No gasket or packing to be renewed.

Its life is five times that of any other flexible conveyer of oil, gas, steam, air, etc.

Positively tight under all pressures.

Guaranteed against all defects in material and workmanship.

The first cost is the only cost.

Size..... inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Nos. 1 and 3, each	\$2.75	\$3.00	\$3.00	\$3.25	\$3.75	\$4.25	\$5.25	\$6.00	\$7.50	\$9.00
No. 2.....each	3.00	3.25	3.25	3.50	4.00	4.50	5.50	6.25	8.75	10.50

Size..... inches	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	*7	*8	*9	*10
Nos. 1 and 3, each	\$11.25	\$14.00	\$15.00	\$18.75	\$18.75	\$25.00	\$50.00	\$55.00	\$90.00	\$100.00
No. 2.....each	12.25	15.50	16.75	20.75	20.75	27.50	55.00	65.00	100.00	120.00

*Screwed or flanged. In ordering state whether steam, air or liquid is to be conveyed and under what pressure.

We furnish joints of brass and bronze, also double joints and double angle joints. Prices on application.

BEATON'S NO. 10 COMBINATION FLOOR AND CEILING PLATE

COLD ROLLED STEEL, HINGED



FIG. 178

Size	inches	$\frac{5}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Black	each	\$0.15	.16	.17	.20	.22	.25	.30	.50	.65	.80	1.00
Nickel Plated	each	.26	.27	.28	.32	.35	.38	.45	.65	.80	1.00	1.25

CAST IRON FLOOR AND CEILING PLATES



FIG. 179



FIG. 180

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Floor Plates	each	\$0.06	.06	.08	.11	.14	.16	.24	.30	.42	.42
Ceiling Plates	each	.11	.13	.16	.18	.23	.27	.36	.50	.55	.68

PIPE HANGER EXTENSION BARS



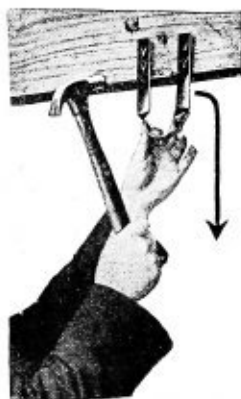
FIG. 181

LIST PRICES

No. 1, for pipe $\frac{1}{2}$ to $1\frac{1}{2}$ inches.....	per foot	\$0.08
No. 2, for pipe 2 to 3 inches.....	per foot	.09
No. 3, for pipe $3\frac{1}{2}$ to 6 inches.....	per foot	.10
No. 4, for pipe 7 to 8 inches.....	per foot	.20
No. 5, for pipe 9 to 12 inches.....	per foot	.28

ORCUTT PIPE HANGER

NO NAILS. NO SCREWS. A HAMMER IS ALL YOU NEED



The Orcutt Pipe Hanger is a new patented device for hanging pipe of different sizes. It is made in one piece, of $\frac{3}{8}$ and $\frac{7}{8}$ inch hoop steel, with four sharp V shaped reinforced prongs that are driven into the wood at any height desired. The arms are of ample length to allow pipe to be suspended from joist, doing away with the old style pipe strap. No chance of loose nails. No waste of time.

Construction of the prongs gives them such a hold in the wood that no vibration of the pipe can jar them loose.

All hangers finished in black enamel, which protects them against rust.

STANDARD HANGERS

Size	inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Length	inches	$5\frac{1}{2}$	6	6	6	$7\frac{1}{4}$	$7\frac{1}{4}$	$8\frac{1}{2}$	10
Weight	pounds	14	15	15	15	21	21	23	25
Price	per 100	\$2.50	2.60	2.60	2.60	2.90	2.90	3.20	3.60

CONDUIT HANGERS

Size	inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Length	inches	4	4	4	4	$4\frac{1}{2}$	$4\frac{1}{2}$	5	$5\frac{1}{2}$
Weight	pounds	13	14	14	14	16	16	17	18
Price	per 100	\$2.50	2.50	2.50	2.50	2.60	2.60	2.70	2.80

Fig. 182

EXTRA LENGTH HANGERS

Size	inches	$\frac{3}{8}$ to 1	$\frac{3}{8}$ to 1	$\frac{3}{8}$ to 1	$\frac{3}{8}$ to 1	$\frac{3}{8}$ to 1	$\frac{3}{8}$ to 1
Length	inches	7	8	9	10	11	12
Price	per 100	\$2.80	3.00	3.20	3.40	3.60	3.80

Size	inches	$1\frac{1}{4}$, $1\frac{1}{2}$	$1\frac{1}{4}$, $1\frac{1}{2}$	$1\frac{1}{4}$, $1\frac{1}{2}$	$1\frac{1}{4}$, $1\frac{1}{2}$	$1\frac{1}{4}$, $1\frac{1}{2}$
Length	inches	$8\frac{1}{4}$	$9\frac{1}{4}$	$10\frac{1}{4}$	$11\frac{1}{4}$	$12\frac{1}{4}$
Price	per 100	\$3.10	3.30	3.50	3.70	3.90

Size	inches	2	2	2	2
Length	inches	$9\frac{1}{2}$	$10\frac{1}{2}$	$11\frac{1}{2}$	12
Price	per 100	\$3.40	3.60	3.80	4.00

SCOTT MALLEABLE IRON PIPE HANGER

No. 1

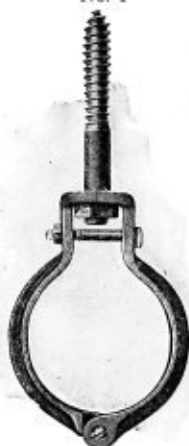


FIG. 183

No. 3



FIG. 184

Combining Simplicity and Strength, the combination double lines with Two hanger feature being new, carrying ers where Three are required with the other types on the market.

Size.....inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6
Price, No. 1.....	\$0.18	.20	.23	.25	.28	.33	.40	.50	.55	.60	.65	.80
Price, No. 3.....	List, same as any two sizes desired.											
Hanger Sockets for $\frac{1}{4}$ -inch Pipe.....												\$0.08
Hanger Sockets for $\frac{1}{2}$ -inch Pipe.....												.10

No. 2



FIG. 185

BEAM CLAMPS

Price, Beam Clamps only, fitting 3 to 7-inch Beam.
Each\$0.60

HOOK PLATES, BEAM HOOKS AND COIL STANDS

Single Hook



FIG. 186

Cast-Iron Hook Plate



FIG. 187

Number of hooks	1	2	3	4	5	6
For 1 in. pipe, $2\frac{1}{2}$ in. between centers. each	\$0.09	\$0.18	\$0.23	\$0.26	\$0.32	\$0.38
" $1\frac{1}{4}$ " " $3\frac{1}{4}$ " " " " "	.10	.21	.27	.32	.41	.52
" $1\frac{1}{2}$ " " $3\frac{1}{2}$ " " " " "	.15	.28	.43	.58	.72	.88
" 2 " " $4\frac{1}{2}$ " " " " "	.22	.43	.65	.90	1.15	1.35

Beam Hook



FIG. 188

Expansion Hook Plate



FIG. 189

BEAM HOOKS, LONG SHANK

Size.....inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price .....each	\$0.13	.15	.18	.22	.24	.35	.65	.90

EXPANSION HOOK PLATES

Number of hooks	1	2	3	4	5	6
For 1 in. pipe, $2\frac{1}{2}$ in. between centers. each	\$0.15	\$0.25	\$0.35	\$0.50	\$0.60	\$0.70
" $1\frac{1}{4}$ " " $3\frac{1}{4}$ " " " " "	.17	.27	.40	.60	.70	.80
" $1\frac{1}{2}$ " " $3\frac{1}{2}$ " " " " "	.25	.40	.60	.75	.90	1.00
" 2 " " $4\frac{1}{2}$ " " " " "	.60	.85	1.00	1.35	1.55	

When Hook Plates are ordered, specifying a greater number of hooks than listed above, we will send two; for instance, an order calling for two 2 x 8 hook plates, we will send four 2 x 4.



FIG. 190

LAUNDRY COIL STANDS

FOR 1-INCH PIPE, WITH MOVABLE HOOK PLATES

Price, for 4 pipes high.....each,	\$2.00
" " 6 " "	2.75
" " 8 " "	3.50
" " 10 " "	4.25
Extra hooks, complete for 1 inch.....net,	.06
" " " " $1\frac{1}{4}$ "	.08
" " " " $1\frac{1}{2}$ "	.10
" " " " 2 "	.15

PIPE CLAMPS AND SADDLES MALLEABLE IRON, WITH WROUGHT IRON STRAPS

Water Pipe Clamps



FIG. 191

Steam Pipe Saddles



FIG. 192

WATER PIPE CLAMPS

Number	Clamps will fit				Price, each	Number	Clamps will fit				Price, each
	Outside Diameter of Circle, Inches	Size, Wrought Iron Pipe, Inches	Size, Outside Diameter Casing, Inches	Size, Cast Iron Pipe, Inches			Outside Diameter of Circle, Inches	Size, Wrought Iron Pipe, Inches	Size, Outside Diameter Casing, Inches	Size, Cast Iron Pipe, Inches	
01	1 1/8	1 1/8	2	...	1.00	19	6 3/8	6	6 3/8	...	\$2.25
12	1 3/8	1 3/8	2 1/2	...	1.00	20	6 3/8	6	6 3/8	...	2.50
22	2 1/8	2 1/8	3	2	1.25	21	6 3/8	6	6 3/8	...	5.00
33	3 1/8	3 1/8	3 1/2	...	1.25	22	7	7	7	6	2.50
44	4 1/8	4 1/8	4	3	1.50	23	7	7	7	6	2.70
54	5 1/8	5 1/8	4 1/2	3	1.50	24	7	7	7	6	5.00
64	6 1/8	6 1/8	5	3	1.75	25	7 3/8	7	7 3/8	...	2.50
74	7 1/8	7 1/8	5 1/2	...	1.75	26	7 3/8	7	7 3/8	...	2.70
84	8 1/8	8 1/8	6	...	2.00	27	7 3/8	7	7 3/8	...	5.00
94	9 1/8	9 1/8	6 1/2	...	4.00	28	8	8	8	7	4.50
105	10 1/8	10 1/8	7	4	1.80	29	8	8	8	7	5.00
115	11 1/8	11 1/8	7 1/2	4	2.15	30	8	8	8	7	5.50
125	12 1/8	12 1/8	8	4	4.00	30 1/2	8 5/8	8	8 5/8	...	5.50
135	13 1/8	13 1/8	8 1/2	...	1.80	31	8 5/8	8	8 5/8	...	5.50
145	14 1/8	14 1/8	9	...	2.15	32	8 5/8	8	8 5/8	...	6.00
155	15 1/8	15 1/8	9 1/2	...	4.00	33	9 5/8	9	9 5/8	...	8.00
166	...	6	5	5	2.00	34	10	10	10	9	9.00
176	...	6	5	5	2.40	35	10 3/4	10	10 3/4	...	9.00
186	...	6	5	5	4.50	36	12 3/4	12	12 3/4	...	10.00

Always order water pipe clamps by number.

Sizes Nos. 33, 34 and 36 have malleable iron strap.

STEAM PIPE SADDLES

Size of Pipe.....in.	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2
Tapped for Pipe, in.	1/2 and 3/4	1/2 to 1 1/2	3/4 to 1 1/2	3/4 to 2	3/4 to 2	3/4 to 2	3/4 to 2
Price.....each	\$0.90	\$1.00	\$1.25	\$1.25	\$1.40	\$1.50	\$2.50
Size of Pipe.....in.	5	5	6	6	7	8	9
Tapped for Pipe, in.	3/4 to 2	2 1/2 & 3	3/4 to 2	2 1/2 to 4	1 to 4	1 to 4	1 1/2 to 4
Price.....each	\$2.75	\$2.75	\$2.75	\$5.75	\$6.50	\$6.50	\$8.50
Size of Pipe.....in.	10	10	12	12	15	16	.....
Tapped for Pipe, in.	1 1/2 to 4	4 1/2 to 6	1 1/2 to 4	4 1/2 to 6	3 to 6	3 to 6	.....
Price.....each	\$10.00	\$10.00	\$14.00	\$14.00	\$22.00	\$25.00	.....

THE YARWAY PIPE-JOINT CLAMP

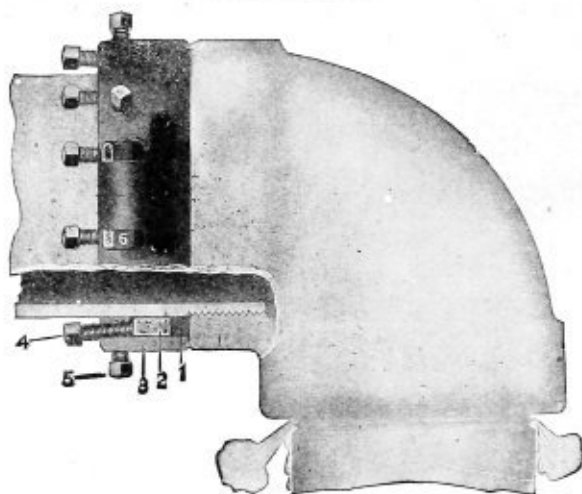


FIG. 193

Description—1. Square packing ring which is forced against leaky joint.

2. Inside ring which is forced against packing 1 by screws 4.

3. Outside ring, which is bolted around pipe by bolts 5 and secured to pipe by the set screw 6, which prevents slipping from leak when adjusting screws 4. Costly leaks at pipe joints and the expense of shutting down entire sections of pipe line for repairs uselessly waste many dollars.

Save all this by using a Yarway Pipe-Joint Clamp.

Stops any leak immediately, and stops it permanently. Can be applied in a very few minutes.

PRICE LIST

Up to 14 inches, inside diameter pipe. 14 inches and up, outside diameter pipe.

Size, Inches	Price	Size, Inches	Price	Size, Inches	Price
$\frac{1}{2}$	\$1.50	$4\frac{1}{2}$	\$6.75	16	\$36.00
$\frac{3}{4}$	1.50	5	7.50	18	40.50
1	1.50	6	9.00	20	45.00
$1\frac{1}{4}$	1.90	7	10.50	21	50.00
$1\frac{1}{2}$	2.25	8	13.00	22	55.00
2	3.00	9	15.75	24	60.00
$2\frac{1}{2}$	3.75	10	18.75	26	65.00
3	4.50	12	22.50	28	70.00
$3\frac{1}{2}$	5.25	14	31.50	30	76.00
4	6.00	15	33.75	32	82.00

Special clamps made to order.

SKINNER PIPE JOINT CLAMP

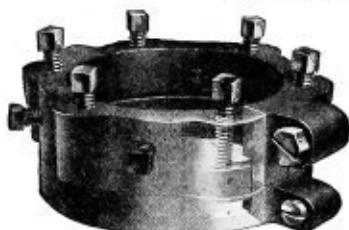
FOR REPAIRING LEAKS AT JOINTS WHERE PIPE IS
SCREWED INTO FITTING

FIG. 194



The Skinner Pipe Joint Clamp is made of malleable iron. It's a man's size clamp—safe, scientific, and full proportioned. It is guaranteed to stop leaks on steam, hot or cold water, gas, oil, air, ammonia or brine lines. Painted to resist rust and equipped with Tobin bronze thrust screws. Carried in stock. Each clamp is packed in a strong box with directions. Anyone can apply it.

Clamp takes up about $2\frac{1}{2}$ " space on the pipe.

Size of Pipe, Inside Diameter, inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Price,..... each	1.50	1.50	1.50	1.90	2.25	3.00	3.75	4.50	5.25
Size of Pipe, Inside Diameter, inches	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
Price,..... each	6.00	6.75	7.50	9.00	10.50	13.00	15.75	18.75	22.50
Size of Pipe, Outside Diam., inches	14	15	16	18	20	21	22	24	26
Price,..... each	31.50	33.75	36.00	40.50	45.00	50.00	55.00	60.00	65.00

EMERGENCY PIPE CLAMPS

For $\frac{1}{2}$ to 4-inch Pipe

FIG. 195

Extra Heavy, for Large Sizes



FIG. 196

Every stationary and marine engineer, plumber, janitor and steam fitter has occasion to use repairs of this kind, and should always have them on hand to use in emergency. They can be attached in a moment, and the use of them often saves valuable property. Made of malleable iron. Being compact, they are available for pipes close together, as in coils.

Size of Pipe..... inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Length..... inches	$3\frac{1}{4}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{3}{4}$	4	$4\frac{1}{4}$	$4\frac{1}{2}$	5	$5\frac{1}{2}$
Price..... each	.40	.45	.50	.60	.70	.80	1.00	1.25	1.50
Size of Pipe..... inches	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
Length..... inches	6	$6\frac{1}{2}$	7	8	9	$9\frac{1}{2}$	10	11	12
Number of Bolts.....	2	3	3	3	3	3	3	4	4
Price..... each	2.00	4.50	5.00	6.00	7.00	8.00	9.00	10.00	12.00

Furnished complete with packing.

HIGHTOWER'S EVER READY-STOP LEAK-REPAIR PLUG

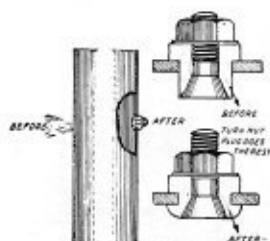


FIG. 197

This plug takes the place of expensive pipe clamps, and is *cheaper*, more *effective* and *will never leak*. It is a very simple device consisting of an alloy plug made of metal that will not deteriorate by coming in contact with steam, air, water (salt or fresh), oil, ammonia, gas, or any other liquid. It has a taper-headed expansion bolt with nut for expanding plug in hole, and is a *permanent repair*. Save pipe fittings, elbows, tees, tanks, etc., by using PLUGS.

Operation: When a rust hole appears, ream it to the proper size to insure sound metal, making hole the size of standard REPAIR PLUGS, made in sizes from $\frac{1}{16}$ " up. Insert PLUG in hole, hold head of PLUG with wrench, screw up on expansion bolt nut until PLUG is secure, when all leak is stopped. Plugs have been tested to 2,000 lbs. hydraulic pressure without leak. Why? Pressure is always against PLUG. Will not fuse at any steam pressure, *superheated or not*.

Size	inches	$\frac{1}{16}$	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{7}{8}$
Price	per dozen	\$3.00	\$3.00	\$3.60	\$4.80	\$6.00

RAPID REPAIR PLUGS

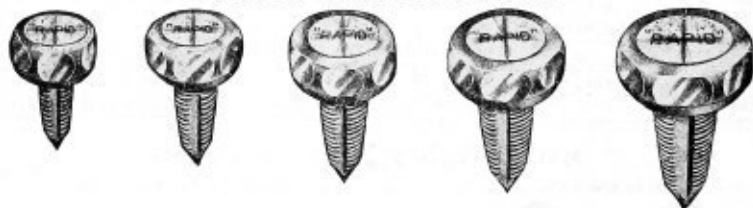


FIG. 198

Repairs leak holes in pipes, tanks, fittings, etc. Makes and taps its own hole. In repairing cast iron pipe or fittings, drill a hole large enough to catch the threads.

Size	No.	1	2	3	4	5
No. of thread	inch	$\frac{7}{16}$	$\frac{3}{4}$	$\frac{7}{8}$	$1\frac{1}{2}$	$2\frac{1}{8}$
Diameter of head	inch	$\frac{3}{4}$	$1\frac{1}{8}$	$1\frac{1}{2}$	$2\frac{1}{8}$	$3\frac{1}{8}$
Price	per dozen	\$3.50	\$3.50	\$4.00	\$4.00	\$4.30



FIG. 199

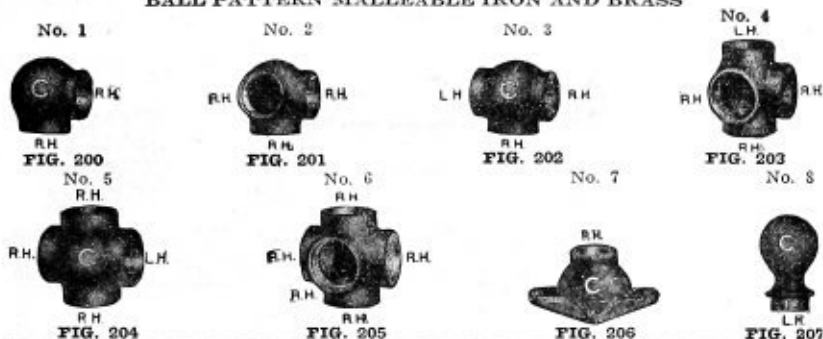
TOGGLE BOLT REPAIR PLUG

Especially valuable in repairing thin shell hot water tanks, etc. The steel washer conforms to the contour of boiler and when tightened, the rubber washer effectually stops the leak. Wrap a little candle wick around bolt head as additional precaution. Used for holes up to one-half inch in diameter.

$\frac{1}{2}$ inch Plug, $2\frac{1}{2}$ inches long. List per dozen.....\$6.00

RAILING FITTINGS

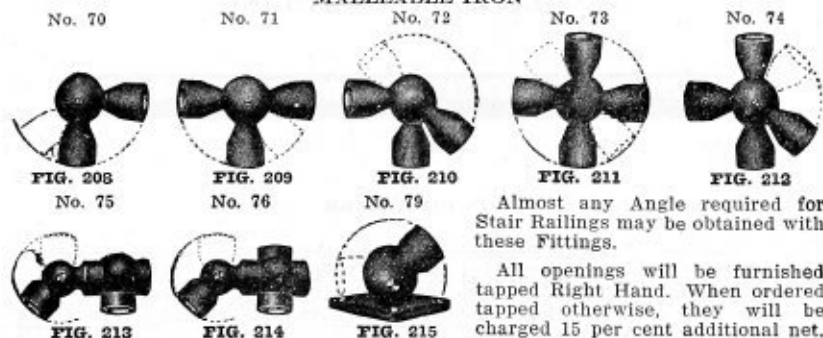
BALL PATTERN MALLEABLE IRON AND BRASS



Kind	Malleable Iron								Finished Brass							
Size .....inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	1/2	3/4	1	1 1/4	1 1/2	2	
No. 1, Elbow each	.15	.18	.20	.35	.45	.72	1.60	2.25	4.50	.40	.60	.80	1.20	1.60	2.50	
No. 2, Elbow, Side Outlet	.20	.23	.25	.40	.50	.80	1.75	2.50	5.00	.75	1.00	1.10	1.70	2.00	3.00	
No. 3, Tee	.20	.23	.25	.40	.50	.75	1.75	2.50	5.00	.60	.85	1.10	1.70	2.00	3.00	
No. 4, Tee, Side Outlet	.30	.33	.35	.45	.55	.90	1.90	2.60	5.25	1.05	1.25	1.50	2.00	2.40	3.50	
No. 5, Cross, each	.30	.33	.35	.45	.58	1.00	1.80	2.60	5.25	1.05	1.25	1.50	2.00	2.40	3.50	
No. 6, Cross, Side Outlet	.35	.38	.40	.50	.65	1.35	2.00	2.75	5.50	1.20	1.45	1.70	2.25	3.00	4.00	
No. 7, Floor Flge, Square	.16	.18	.20	.40	.50	.90	1.35	2.50	5.00	.75	.90	1.00	1.35	1.75	2.50	
No. 8, Ball Ornament	.16	.18	.20	.25	.35	.90	1.35	2.00	4.25	.75	.90	1.00	1.35	1.75	2.50	

ADJUSTABLE RAILING FITTINGS

MALLEABLE IRON



Almost any Angle required for Stair Railings may be obtained with these Fittings.

All openings will be furnished tapped Right Hand. When ordered tapped otherwise, they will be charged 15 per cent additional net.

PRICES EACH

Pipe Size.....inches	1	1 1/4	1 1/2	2	Pipe Size.....inches	1	1 1/4	1 1/2	2
No. 70, Elbow	\$1.10	1.25	1.70	2.25	No. 74, Stair Cross...	\$1.50	1.85	2.50	2.75
No. 71, Tee	1.20	1.50	2.00	2.50	No. 75, Str. Ldg. Tee	.90	1.10	1.50	2.15
No. 72, Stair Tee...	1.30	1.60	2.15	2.50	No. 76, Str. Ldg. Cr.	1.00	1.20	1.60	2.40
No. 73, Cross	1.50	1.75	2.35	2.75	No. 79, Flange	1.65	1.75	1.90	2.50

Add 50 per cent to above prices for galvanized railing fittings.

GAS PIPE HOOKS



FIG. 216

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price	per 100	\$0.30	.35	.40	.50	.65	.85	1.00	1.30

TINNED STRAPS



FIG. 217

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price	per pound	\$0.18	.18	.18	.18	.18	.18	.18	.18

SEAMLESS BRASS TUBING



FIG. 218

IRON PIPE SIZES

Iron pipe size.....	inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Advance over base.....		\$0.08	.07	.02	.01	.....	Base Price			
Approx. weight per foot...	lbs.	.25	.43	.62	.09	1.25	1.7	2.5	3.	4.

Iron pipe size.....	inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8
Advance over base		Base	\$0.01	.02	.04	.06	.07	.09	.11	
Approx. weight per foot...	lbs.	5.75	8.3	10.9	12.7	13.9	15.75	18.31	26.28	29.88

CUTTING BRASS TUBING

ADDITIONAL TO LIST

FINISHED BRASS STEAM FITTINGS

Elbow



FIG. 219

Tee



FIG. 220

Cross



FIG. 221

Union, Finished



FIG. 222

IRON PIPE SIZES

Size	Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4
Elbows	Each	\$0.30	0.35	0.45	0.56	0.75	1.10	1.55	2.00	3.00	5.50	9.00	14.00	17.50
Elbows, Reducing	Each	..	.44	.55	.70	.95	1.40	1.90	2.50	3.75	6.75	11.25	17.50	22.00
Elbows, 45°	Each	.38	.45	.55	.66	.85	1.23	1.70	2.20	3.25	6.00	9.75	..	19.50
Elbows, Street	Each	.47	.52	.63	.83	1.08	1.45	2.30	3.00	4.50	..	..	..	..
Elbows, Drop, Female	Each	..	.85	1.05	1.40	2.00	2.80	3.60	5.40	..	..	..	..	..
Elbows, Side Outlet	Each	..	1.35	1.70	2.25	3.30	4.70	6.00	9.00	16.50	27.00	..	..	..
Tees	Each	.42	.49	.63	.80	1.05	1.50	2.15	2.80	4.20	7.75	12.75	19.50	24.50
Tees, Reducing	Each	..	.60	.77	1.00	1.30	1.85	2.65	3.50	5.25	9.75	15.80	24.50	30.50
Tees, Drop, Female	Each	..	1.13	1.37	1.80	2.55	..	..	..	..	..	..	..	..
Tees, 4-Way	Each	..	2.05	2.70	3.90	5.70	7.40	11.50	..	..	..	..	..	..
Crosses	Each	.60	.70	.90	1.10	1.50	2.20	3.10	4.00	6.00	11.00	18.00	28.00	35.00
Crosses, Reducing	Each	.88	1.10	1.40	1.85	2.75	3.85	5.00	7.50	13.75	22.50	35.00	44.00	..
Bushings	Each	..	.22	.27	.35	.47	.70	1.00	1.40	2.00	3.00	4.50	6.25	8.00
Plugs	Each	.23	.30	.37	.43	.55	.75	1.00	1.30	1.95	3.00	4.25	6.25	8.00
Solid Plugs	Each	..	..	.43	.50	.65	.90	1.35	1.90	2.90	4.50	6.50	10.00	13.00
Countersunk Plugs	Each	..	..	..	.42	.55	.80	1.15	1.55	2.25	..	..	..	..
Caps	Each	.20	.25	.31	.40	.55	.77	1.10	1.50	2.25	4.00	5.50	8.00	10.00
Lock-nuts	Each	.24	.25	.32	.40	.50	.65	.85	1.10	1.60	3.25	4.75	6.50	8.00
Reducers	Each	..	.35	.45	.56	.75	1.05	1.55	1.90	2.75	4.75	7.00	12.00	15.50
Couplings	Each	.24	.28	.36	.46	.63	.90	1.30	1.60	2.35	4.00	5.75	9.75	12.50
Couplings, R. & L.	Each	..	.37	.47	.58	.80	1.15	1.65	2.10	3.00	5.10	7.50	..	..
Return Bends, Close	Each	..	..	..	1.55	2.05	2.85	3.75	4.90	7.25	..	..	..	..
Return Bends, Open	Each	..	..	..	1.65	2.15	2.90	4.10	5.40	7.75	14.25	20.00	..	..
Y Bends	Each	..	..	..	1.60	2.15	3.05	4.45	5.70	8.50	15.50	25.00	..	41.00
Unions	Each	.50	.60	.85	1.05	1.40	1.90	2.75	3.25	5.00	9.00	14.00	25.00	33.00

Right and Left Elbows, Right and Left Return Bends, also Bushings and Reducers, reducing more than two sizes, will be furnished at an advance of 25 per cent. over above prices.

BRASS NIPPLES

Size	Length Close	Close	Length, Inches										
			1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$	5	5 $\frac{1}{2}$	6	
$\frac{1}{8}$	$\frac{3}{4}$	\$0.11	\$0.13	\$0.15	\$0.17	\$0.19	\$0.21	\$0.23	\$0.25	\$0.27	\$0.29	\$0.31	
$\frac{1}{4}$	$\frac{7}{8}$	.13	.16	.19	.22	.25	.28	.31	.34	.37	.40	.47	
$\frac{3}{8}$	1	.15	.19	.23	.27	.31	.35	.39	.43	.47	.51	.54	
$\frac{1}{2}$	1 $\frac{1}{4}$	.23	.25	.30	.35	.40	.45	.50	.55	.60	.65	.74	
$\frac{3}{4}$	1 $\frac{3}{4}$	.28	..	.35	.42	.49	.56	.63	.70	.77	.84	.91	
1	1 $\frac{1}{2}$	.37	..	.44	.53	.62	.71	.80	.89	.98	1.07	1.14	
1 $\frac{1}{4}$	1 $\frac{3}{4}$	.60	..	..	.75	.88	1.01	1.14	1.27	1.40	1.53	1.64	
1 $\frac{1}{2}$	1 $\frac{3}{4}$	.70	..	..	.90	1.05	1.20	1.35	1.50	1.65	1.80	1.95	
2	2	1.00	..	..	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	
2 $\frac{1}{2}$	2 $\frac{1}{2}$	1.70	..	..	..	2.00	2.30	2.60	2.90	3.20	3.50	3.80	
3	2 $\frac{1}{2}$	2.50	..	..	..	2.90	3.30	3.70	4.10	4.50	4.90	5.30	
3 $\frac{1}{2}$	2 $\frac{3}{4}$	4.00	..	..	..	..	..	5.40	6.00	6.60	7.20	7.80	
4	3	4.75	..	..	..	..	..	6.15	6.85	7.55	8.25	8.95	

Finished Brass Nipples, longer than close, will be furnished at an advance of 25 per cent. over above prices.

ROUGH BRASS STEAM FITTINGS

IRON PIPE SIZE

Elbow



FIG. 223

Tee



FIG. 224

Cross



FIG. 225

Union



FIG. 226

Size .....inches	1/8	1/4	3/8	1/2	3/4	1	1 1/8	1 1/2	2	2 1/2	3	3 1/2	4
Elbows .....each	.12	.15	.20	.28	.40	.63	.90	1.20	2.00	3.50	6.00	8.00	10.00
Elbows, Reducing.....each	..	.19	.25	.35	.50	.80	1.10	1.50	2.50	4.25	7.50	10.00	12.50
Elbows, 45°.....each	.16	.20	.25	.31	.40	.63	.90	1.20	2.00	3.50	6.00	..	10.00
Elbows, Street.....each	.25	.27	.33	.48	.63	.85	1.50	2.00	3.25	..	..	..	..
Elbows, Drop, Fem.....each	..	..	.35	.45	.65	1.05	1.50	2.00	3.40	..	..	..	..
Elbows, Side Outlet.....each	..	..	.60	.85	1.20	1.90	2.75	3.60	6.00	10.50	18.00	..	..
Tees .....each	.17	.21	.28	.40	.55	.85	1.25	1.70	2.80	5.00	8.50	11.00	14.00
Tees, Reducing.....each	..	.25	.35	.50	.70	1.05	1.55	2.10	3.50	6.25	10.50	14.00	17.50
Tees, Drop, Female.....each	..	..	.43	.57	.80	1.25	..	..	..	..	..	..	..
Tees, 4-Way.....each	..	..	..	1.20	1.65	2.50	3.75	5.00	8.50	..	..	..	..
Crosses .....each	.25	.30	.40	.55	.80	1.25	1.80	2.40	4.00	7.00	12.00	16.00	20.00
Crosses, Reducing.....each	..	.38	.50	.70	1.00	1.55	2.25	3.00	5.00	8.75	15.00	20.00	25.00
Bushings .....each	..	.10	.12	.15	.22	.35	.50	.70	1.00	1.50	2.50	3.75	5.00
Faced Bushings.....each	..	.12	.15	.19	.27	.44	.62	.87	1.25	1.85	3.10	4.75	6.25
Plugs .....each	.08	.10	.12	.15	.20	.30	.45	.60	.95	1.50	2.25	3.75	5.00
Solid Plugs.....each	..	..	.18	.22	.30	.45	.80	1.20	1.90	3.00	4.50	7.50	10.00
Countersunk Plugs.....each	..	..	..	.22	.30	.45	.65	.90	1.40	..	..	..	..
Caps .....each	.10	.13	.16	.20	.30	.42	.60	.80	1.25	2.50	3.50	5.50	7.00
Lock-nuts .....each	.10	.10	.12	.15	.20	.28	.40	.55	.80	1.75	2.75	4.00	5.00
Reducers .....each	..	.15	.20	.28	.40	.60	.90	1.10	1.75	2.75	4.00	6.00	8.00
Couplings .....each	.10	.13	.17	.25	.37	.55	.80	1.00	1.60	2.50	3.50	5.25	7.00
Couplings, R. & L.....each	..	.17	.22	.30	.45	.70	1.00	1.30	2.00	3.10	4.50	..	..
Return Bends, Close.....each	..	..	..	.70	1.00	1.25	1.80	2.50	4.25	..	..	..	..
Return Bends, Open.....each	..	..	..	.80	1.10	1.40	2.15	3.00	4.75	8.25	11.00	..	..
Y Bends.....each	..	..	..	.75	1.10	1.65	2.50	3.30	5.50	9.50	16.00	..	26.00
Unions .....each	..	.50	.65	.85	1.15	1.60	2.25	2.70	4.00	7.50	11.50	..	..

Right and left elbows, right and left return bends, also bushings and reducers, reducing more than two sizes, will be furnished at an advance of 25 per cent over above prices.

SEMI-FINISHED BRASS UNIONS

Size .....inches	1/8	1/4	3/8	1/2	3/4	1	1 1/8	1 1/2	*2	*2 1/2	*3	*3 1/2	*4
Price .....each	\$0.45	.55	.75	.95	1.30	1.75	2.50	3.00	4.50	8.25	12.75	22.50	30.00

*Made to order only.

EXTRA HEAVY ROUGH BRASS FITTINGS
MADE FROM STANDARD CAST IRON PATTERNS
FLAT BAND—IRON PIPE SIZE
FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

Elbow



FIG. 227

Tee



FIG. 228

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Elbows	each	\$0.33	.45	.65	1.00	1.50	2.25	3.00	4.50	8.00	11.25	16.00	22.00
Elbows, Reducing	each		.55	.75	1.20	1.80	2.60	3.50	5.25	9.00	13.00	19.00	25.00
Elbows, 45°	each		.55	.75	1.10	1.65	2.50	3.25	4.50	8.00	11.25	16.00	22.00
Tees	each	.45	.60	.90	1.35	2.00	3.00	4.00	6.00	10.75	15.00	22.00	30.00
Tees, Reducing	each		.70	1.05	1.55	2.30	3.50	4.50	6.75	12.00	17.00	25.00	35.00

EXTRA HEAVY BRASS UNION
FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

No. 96E

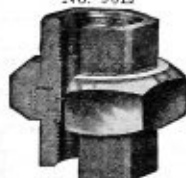


FIG. 229

GROUND TAPER JOINT
NO GASKET REQUIRED

RING FINISHED
HEXAGON TAIL PIECES
ROUGH

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	$3\frac{1}{2}$
No. 96E	each	\$1.10	1.40	1.60	1.85	3.00	4.00	5.25	7.50	10.00	15.00

*Made to order only.

No. 240H



FIG. 229A

HYDRAULIC BRASS UNIONS

Finished All Over.

Fitted with Copper Gasket

For cold water or oil working pressures as follows:

$\frac{1}{4}$ inch to $1\frac{1}{4}$ inch, 2,000 pounds hydrostatic

$1\frac{1}{2}$ inch and 2 inch, 1,500 pounds hydrostatic

$2\frac{1}{2}$ inch and 3 inch, 1,000 pounds hydrostatic

Crane Special Brass

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
No. 240 H	each	\$1.25	1.50	2.00	3.00	4.00
Size	inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	$3\frac{1}{2}$
No. 240 H	each	\$5.00	7.00	10.00	12.00	15.00

*Made to order only.

WORKING PRESSURE

No. 240 H Unions are suitable for the working pressures specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. **WHEN SUBJECT TO SHOCK** they are **NOT** recommended for these pressures.

STANDARD FLANGED FITTINGS

FOR 125 POUNDS STEAM WORKING PRESSURE

90° Elbows



FIG. 230

45° Elbows



FIG. 231

Size Inches	Diameter of Flanges Inches	Center to Face Inches		Price, Each			
		"A" 90°	"C" 45°	90°		45°	
				With Faced Flanges	With Faced and Drilled Flanges	With Faced Flanges	With Faced and Drilled Flanges
1¼	4½	3¾	2	\$ 3.00	3.60	3.30	3.90
1½	5	4	2¼	3.00	3.60	3.30	3.90
2	6	4½	2½	3.00	3.60	3.30	3.90
2½	7	5	3	3.15	3.75	3.50	4.10
3	7½	5½	3	3.45	4.15	3.80	4.50
3½	8½	6	3½	4.05	4.90	4.50	5.35
4	9	6½	4	4.50	5.50	5.00	6.00
4½	9¾	7	4	5.50	6.50	6.00	7.00
5	10	7½	4½	6.25	7.25	6.90	7.90
6	11	8	5	7.60	8.90	8.35	9.65
7	12½	8½	5½	10.50	12.00	11.00	12.50
8	13½	9	5½	12.00	13.60	12.60	14.20
9	15	10	6	17.00	19.25	17.75	20.00
10	16	11	6½	19.00	21.70	20.00	22.70
12	19	12	7½	28.00	31.00	29.50	32.50
14	21	14	7½	41.50	45.25	41.50	45.25
15	22¼	14½	8	47.00	51.50	47.00	51.50
16	23½	15	8	54.50	59.50	54.50	59.50
18	25	16½	8½	71.00	77.00	71.00	77.00
20	27½	18	9½	90.00	97.00	90.00	97.00
22	29½	20	10	113.00	122.00	113.00	122.00
24	32	22	11	140.00	150.00	140.00	150.00

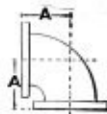
Furnished faced only, unless otherwise ordered.

Larger sizes made to order. Prices on application.

For drilling template, see page 73

STANDARD FLANGED FITTINGS **FOR 125 POUNDS STEAM WORKING PRESSURE**

Reducing Taper Elbows

**FIG. 232**

Size Inches	Diameter of Flanges Inches	Center to Face "A" Inches	Price, Each		Size Inches	Diameter of Flanges Inches	Center to Face "A" Inches	Price, Each	
			With Faced Flanges	With Faced and Drilled Flanges				With Faced Flanges	With Faced and Drilled Flanges
3 x 1½	7½ x 5	5½	\$ 6.90	7.60	8x 6	13½ x 11	9	\$ 24.00	25.60
3 x 2	7½ x 6	5½	6.90	7.60	8x 7	13½ x 12½	9	24.00	25.60
3 x 2½	7½ x 7	5½	6.90	7.60	9x 6	15 x 11	10	34.00	36.25
3½ x 2	8½ x 6	6	8.10	8.95	9x 8	15 x 13½	10	34.00	36.25
3½ x 2½	8½ x 7	6	8.10	8.95	10x 4½	16 x 9½	11	38.00	40.70
3½ x 3	8½ x 7½	6	8.10	8.95	10x 5	16 x 10	11	38.00	40.70
4 x 2	9 x 6	6½	9.00	10.00	10x 6	16 x 11	11	38.00	40.70
4 x 2½	9 x 7	6½	9.00	10.00	10x 7	16 x 12½	11	38.00	40.70
4 x 3	9 x 7½	6½	9.00	10.00	10x 8	16 x 13½	11	38.00	40.70
4 x 3½	9 x 8½	6½	9.00	10.00	10x 9	16 x 15	11	38.00	40.70
4½ x 2½	9½ x 7	7	11.00	12.00	12x 6	19 x 11	12	56.00	59.00
4½ x 3½	9½ x 8½	7	11.00	12.00	12x 7	19 x 12½	12	56.00	59.00
4½ x 4	9½ x 9	7	11.00	12.00	12x 8	19 x 13½	12	56.00	59.00
5 x 2½	10 x 7	7½	12.50	13.50	12x 10	19 x 16	12	56.00	59.00
5 x 3	10 x 7½	7½	12.50	13.50	14x 10	21 x 16	14	70.00	73.75
5 x 4	10 x 9	7½	12.50	13.50	14x 12	21 x 19	14	70.00	73.75
6 x 2½	11 x 7	8	15.25	16.55	15x 10	22½ x 16	14½	80.00	84.50
6 x 3	11 x 7½	8	15.25	16.55	15x 12	22½ x 19	14½	80.00	84.50
6 x 3½	11 x 8½	8	15.25	16.55	16x 12	23½ x 19	15	90.00	95.00
6 x 4	11 x 9	8	15.25	16.55	16x 14	23½ x 21	15	90.00	95.00
6 x 5	11 x 10	8	15.25	16.55	16x 15	23½ x 22½	15	90.00	95.00
7 x 5	12½ x 10	8½	21.00	22.50	18x 15	25 x 22½	16½	105.00	111.00
7 x 6	12½ x 11	8½	21.00	22.50	18x 16	25 x 23½	16½	105.00	111.00
8 x 3½	13½ x 8½	9	24.00	25.60	20x 14	27½ x 21	18	120.00	127.00
8 x 4	13½ x 9	9	24.00	25.60	20x 16	27½ x 23½	18	120.00	127.00
8 x 5	13½ x 10	9	24.00	25.60	20x 18	27½ x 25	18	120.00	127.00

Elbows not listed above, made to order at special price. Flanged fittings will be furnished faced only, unless otherwise ordered.

For drilling template, see page 78.

STANDARD FLANGED FITTINGS

FOR 125 POUNDS STEAM WORKING PRESSURE

Long Radius Elbow



FIG. 233

Square Base Elbow



FIG. 234

Round Base Elbow

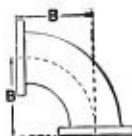


FIG. 235

LONG RADIUS ELBOWS

BASE ELBOWS

Size Inches	"B" Center to Face Inches	Radius Inches	Diam. of Flange Inches	Price, Each		Size Inches	Center to Face Inches	Center to Face of Round or Square Base Inches	Diam. of Base Flange Inches	Price, Each		Facing and Drilling Base Flange
				With Faced Flanges	With Faced and Drilled Flanges					Faced Except Base Flange	Faced and Drilled Except Base Flange	
2	6 1/2	5 3/4	6	\$ 5.00	5.90	...	...	...	...	...	...	...
2 1/2	7	5 7/8	7	5.25	6.15	...	...	...	...	...	...	...
3	7 3/4	6 1/4	7 1/2	5.75	6.85	...	...	...	...	...	...	...
3 1/2	8 1/2	6 3/4	8 1/2	6.75	8.00	...	...	...	...	...	...	...
4	9	7 3/8	9	7.50	9.00	4	6 1/2	6 1/2	6	\$ 9.00	10.00	3.00
4 1/2	9 1/2	7 3/4	9 1/4	9.25	10.75	4 1/2	7	6 3/4	6	11.00	12.00	3.00
5	10 1/4	8 1/2	10	10.50	12.00	5	7 1/2	7	7	12.50	13.50	3.50
6	11 1/2	9 3/8	11	12.65	14.60	6	8	7 1/2	7	15.25	16.55	3.50
7	12 3/4	10 7/8	12 1/2	17.50	19.75	7	8 1/2	8 1/4	7	21.00	22.50	3.50
8	14	12	13 1/2	20.00	22.40	8	9	8 3/4	9	24.00	25.60	5.00
9	15 1/4	13	15	28.50	31.85	9	10	9 1/2	9	34.00	36.25	5.00
10	16 1/2	14 1/8	16	31.50	35.50	10	11	10	9	38.00	40.70	5.00
12	19	16 3/4	19	46.50	51.00	12	12	10 1/2	11	56.00	59.00	7.50
14	21 1/2	18 3/8	21	69.00	74.50	14	14	13 1/2	11	70.00	73.75	7.50
15	22 3/4	20	22 1/4	78.00	84.75	15	14 1/2	14	11	80.00	84.50	7.50
16	24	21 1/4	23 1/2	91.00	98.50	16	15	14 3/4	11	90.00	95.00	7.50
18	26 1/2	23 3/8	25	118.00	127.00	18	16 1/2	15 1/2	13 1/2	105.00	111.00	12.00
20	29	26	27 1/2	150.00	160.00	...	...	...	...	...	...	...



*The measurement across the flat edge of square base flange is the same as the diameter of the round base flange.

Long radius elbows of different dimensions from above, made to order at a special price.

Prices given on flanged base elbows do not include facing or drilling of base flanges.

Furnished faced only, unless otherwise specified.

BASE TEES

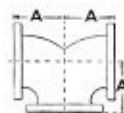
Base tees made to order. Prices on application.

For drilling template, see page 78.

STANDARD FLANGED FITTINGS FOR 125 POUNDS STEAM WORKING PRESSURE

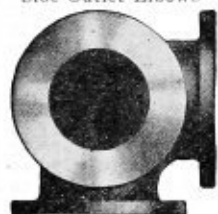
Double Branch Elbows

Reducing Double Branch Elbows

**FIG. 236****FIG. 237**

Size Inches	"A" Center to Face, In.	"AA" Face to Face, In.	Diam. of Flanges, Inches	Straight		Reducing	
				Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
4	6½	13	9	\$28.50	30.00	31.50	33.00
5	7½	15	10	36.00	37.50	39.50	41.00
6	8	16	11	38.00	40.00	42.00	44.00
7	8½	17	12½	42.75	45.00	47.75	50.00
8	9	18	13½	47.50	50.00	52.50	55.00
10	11	22	16	66.00	70.00	73.50	77.50
12	12	24	19	90.50	95.00	100.50	105.00
14	14	28	21	119.50	125.00	132.50	138.00
16	15	30	23½	142.50	150.00	157.50	165.00

Lists given above for Reducing Fittings are for Fittings reducing on the branches with branches same size. Furnished faced only, unless otherwise ordered.

Flanged
Side Outlet ElbowsReducing Side
Outlet Flanged Elbows**FIG. 238****FIG. 239**

Size Inches	"A" Center to Face, In.	Diam. of Flanges, Inches	Straight		Reducing	
			Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
4	6½	9	\$ 26.50	28.00	29.50	31.00
5	7½	10	28.50	30.00	31.50	33.00
6	8	11	33.00	35.00	36.00	38.00
7	8½	12½	40.25	42.50	44.75	47.00
8	9	13½	47.50	50.00	52.50	55.00
10	11	16	76.00	80.00	84.00	88.00
12	12	19	100.50	105.00	110.50	115.00
14	14	21	129.50	135.00	144.50	150.00
16	15	23½	152.50	160.00	167.50	175.00

Orders should specify whether outlet is to be on radial or intersecting center lines. Furnished faced only, unless otherwise ordered. For drilling templates, see page 78.

STANDARD FLANGED FITTINGS FOR 125 POUNDS STEAM WORKING PRESSURE

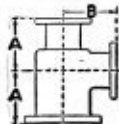
Reducing Tees
Reducing in Run or
Branch



FIG. 240



FIG. 241



Size Inches	Diameter of Flanges Inches	*Face to Face "AA" Inches	*Center to Face Inches		Price, Each			
			"A"	"B"	Straight		†Reducing	
					With Faced Flanges	With Faced and Drilled Flanges	With Faced Flanges	With Faced and Drilled Flanges
1½	4½	7½	3¾	3¾	\$ 4.35	5.25	....	....
1½	5	8	4	4	4.35	5.25	\$5.00	5.90
2	6	9	4½	4½	4.35	5.25	5.00	5.90
2½	7	10	5	5	4.55	5.45	5.25	6.15
3	7½	11	5½	5½	5.00	6.10	5.75	6.85
3½	8½	12	6	6	5.85	7.10	6.75	8.00
4	9	13	6½	6½	6.50	8.00	7.50	9.00
4½	9½	14	7	7	8.00	9.50	9.25	10.75
5	10	15	7½	7½	9.10	10.60	10.50	12.00
6	11	16	8	8	11.00	12.95	12.65	14.60
7	12½	17	8½	8½	15.25	17.50	17.50	19.75
8	13½	18	9	9	17.40	19.80	20.00	22.40
9	15	20	10	10	24.65	28.00	28.50	31.85
10	16	22	11	11	27.50	31.50	31.50	35.50
12	19	24	12	12	40.50	45.00	46.50	51.00
14	21	28	14	14	60.00	65.50	69.00	74.50
15	22½	29	14½	14½	68.00	74.75	78.00	84.75
16	23½	30	15	15	79.00	86.50	91.00	98.50
18	25	33	16½	16½	103.00	112.00	118.00	127.00
20	27½	36	18	18	130.00	140.00	150.00	160.00
22	29½	40	20	20	164.00	177.00	189.00	202.00
24	32	44	22	22	203.00	218.00	233.00	248.00

*All reducing tees, 16 inches and smaller, take the same center to face dimensions as straight size tees. All tees reducing on the run only, take the same dimensions, center to face, as the largest straight size. Tees, sizes 18 inches and larger, reducing on the outlet, are made in two lengths, depending on the size of outlet. For variations from above dimensions in 10-inch size and larger with small outlet, see dimensions and templates for drilling. Furnished faced only, unless otherwise specified. Larger sizes made to order. Prices on application.

Bullheads or tees having outlet larger than the run, will be the same length center to face of all openings as a tee with all openings of the size of the outlet. For example, a 12x12x16-inch tee will be governed by the dimensions of the 16-inch long body tee (upper table), namely, 15 inches center to face of all openings and 30 inches face to face.

†Reducing in run or branch. For drilling template, see page 78.

STANDARD FLANGED FITTINGS FOR 125 POUNDS STEAM WORKING PRESSURE

Single Sweep Tees

Reducing Single Sweep Tees
Reducing in Run or Branch

FIG. 242



FIG. 243

Size Inches	Diameter of Flanges Inches	*Face to Face "AA" Inches	*Center to Face Inches		Price, Each			
			"A"	"B"	Straight		*Reducing	
					With Faced Flanges	With Faced and Drilled Flanges	With Faced Flanges	With Faced and Drilled Flanges
2	6	9	4½	4½	\$ 5.00	5.90	....	....
2½	7	10	5	5	5.25	6.15	\$6.00	6.90
3	7½	11	5½	5½	5.75	6.85	6.60	7.70
3½	8½	12	6	6	6.75	8.00	7.75	9.00
4	9	13	6½	6½	7.50	9.00	8.65	10.15
4½	9½	14	7	7	9.25	10.75	10.60	12.10
5	10	15	7½	7½	10.50	12.00	12.00	13.50
6	11	16	8	8	12.65	14.60	14.50	16.45
7	12½	17	8½	8½	17.50	19.75	20.00	22.25
8	13½	18	9	9	20.00	22.40	23.00	25.40
9	15	20	10	10	28.50	31.85	32.75	36.10
10	16	22	11	11	31.50	35.50	36.00	40.00
12	19	24	12	12	46.50	51.00	53.50	58.00
14	21	28	14	14	69.00	74.50	79.00	84.50
15	22½	29	14½	14½	78.00	84.75	90.00	96.75
16	23½	30	15	15	91.00	98.50	105.00	112.50
18	25	33	16½	16½	118.00	127.00	135.00	144.00
20	27½	36	18	18	150.00	160.00	173.00	183.00
22	29½	40	20	20	189.00	202.00	217.00	230.00
24	32	44	22	22	233.00	248.00	268.00	283.00

*All reducing tees, 16 inches and smaller, take the same center to face dimensions as straight size tees. All tees reducing on the run only, take the same dimensions, center to face, as the largest straight size. Tees, sizes 18 inches and larger, reducing on the outlet, are made in two lengths, depending on the size of outlet.

†Reducing in run or branch.

Furnished faced only, unless otherwise ordered. Reducing single sweep tees made to order only. Single sweep tees with the side openings larger than the run not made.

Bullheads or tees having outlet larger than the run will be the same length center to face of all openings as a tee with all openings of the size of the outlet. For example, a 12x12x16-inch tee will be governed by the dimensions of the 16-inch long body tee, namely, 15 inches center to face of all openings and 30 inches face to face.

For drilling template, see page 78.

STANDARD FLANGED FITTINGS

FOR 125 POUNDS STEAM WORKING PRESSURE

Double Sweep Tees

Reducing Double Sweep Tees



FIG. 244

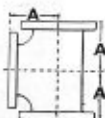
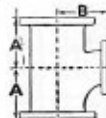


FIG. 245



Size Inches	Diameter of Flanges Inches	*Face to Face "AA" Inches	*Center to Face Inches		Price, Each			
			"A"	"B"	Straight		†Reducing	
					With Faced Flanges	With Faced and Drilled Flanges	With Faced Flanges	With Faced and Drilled Flanges
2	6	9	4½	4½	\$ 5.00	5.90	....	....
2½	7	10	5	5	5.25	6.15	\$ 6.00	6.90
3	7½	11	5½	5½	5.75	6.85	6.60	7.70
3½	8½	12	6	6	6.75	8.00	7.75	9.00
4	9	13	6½	6½	7.50	9.00	8.65	10.15
4½	9¼	14	7	7	9.25	10.75	10.60	12.10
5	10	15	7½	7½	10.50	12.00	12.00	13.50
6	11	16	8	8	12.65	14.60	14.50	16.45
7	12½	17	8½	8½	17.50	19.75	20.00	22.25
8	13½	18	9	9	20.00	22.40	23.00	25.40
9	15	20	10	10	28.50	31.85	32.75	36.10
10	16	22	11	11	31.50	35.50	36.00	40.00
12	19	24	12	12	46.50	51.00	53.50	58.00
14	21	28	14	14	69.00	74.50	79.00	84.50
15	22¼	29	14½	14½	78.00	84.75	90.00	96.75
16	23½	30	15	15	91.00	98.50	105.00	112.50
18	25	32	16½	16½	118.00	127.00	135.00	144.00
20	27½	36	18	18	150.00	160.00	173.00	183.00
22	29½	40	20	20	189.00	202.00	217.00	230.00
24	32	44	22	22	233.00	248.00	268.00	283.00

*All tees reducing on outlet, 16 inches and smaller, take the same center to face dimensions as straight size tees. Tees, sizes 18 inches and larger, reducing on the outlet, are made in two lengths, depending on the size of outlet.

†Reducing in branch only.

Furnished faced only, unless otherwise ordered. Double sweep tees are not made reducing on the run. Should such tees, however, be wanted, we can have patterns altered (which will be expensive) and charge at a special price. The branch (outlet) can only be increased within a reasonable limit, which must be regulated by the patterns.

For drilling template, see page 78.

STANDARD FLANGED FITTINGS

FOR 125 POUNDS WORKING STEAM PRESSURE

Side Outlet Tees

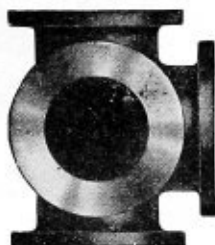


FIG. 246

Reducing Side Outlet Tees

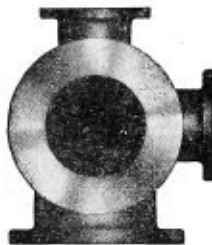
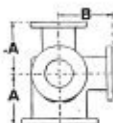
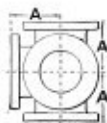


FIG. 247



Size Inches	"AA" Face to Face, Inches	"A" Center to Face, Inches	"B" Center to Face, Inches	Diam. of Flange, Inches	Straight		Reducing	
					Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
4	13	6½	6½	9	\$ 31.00	33.00	34.00	36.00
5	15	7½	7½	10	35.00	37.00	39.00	41.00
6	16	8	8	11	42.25	45.00	47.25	50.00
7	17	8½	8½	12½	49.50	52.50	55.00	58.00
8	18	9	9	13½	56.75	60.00	62.75	66.00
10	22	11	11	16	84.50	90.00	94.50	100.00
12	24	12	12	19	114.00	120.00	126.00	132.00
14	28	14	14	21	142.50	150.00	157.50	165.00
16	30	15	15	23½	170.00	180.00	190.00	200.00

Larger sizes made to order. Prices on application.

Furnished faced only, unless otherwise ordered.

For drilling templates, see page 78.

STANDARD FLANGED FITTINGS FOR 125 POUNDS STEAM WORKING PRESSURE

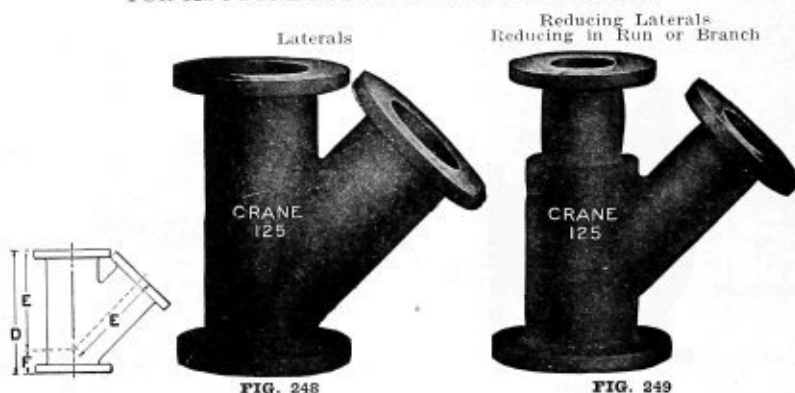


FIG. 248

FIG. 249

Size Inches	Diameter of Flanges Inches	"D" *Face to Face of Run Inches	*Center to Face of Run or Outlet Inches	Price, Each			
				Straight		†Reducing	
				With Faced Flanges	With Faced and Drilled Flanges	With Faced Flanges	With Faced and Drilled Flanges
2	6	10½	8	\$ 6.75	7.95	....	....
2½	7	12	9½	6.95	8.15	8.00	9.20
3	7½	13	10	7.65	9.05	8.75	10.15
3½	8½	14½	11½	9.00	10.70	10.35	12.05
4	9	15	12	10.00	12.00	11.50	13.50
4½	9½	15½	12½	12.00	14.00	13.75	15.75
5	10	17	13½	13.75	15.75	15.75	17.75
6	11	18	14½	16.75	19.25	19.25	21.75
7	12½	20½	16½	23.00	26.00	26.50	29.50
8	13½	22	17½	26.50	29.75	30.50	33.75
9	15	24	19½	37.50	42.00	43.00	47.50
10	16	25½	20½	42.00	47.50	48.00	53.50
12	19	30	24½	61.50	67.50	71.00	77.00
14	21	33	27	91.00	98.50	105.00	112.50
15	22¼	34½	28½	103.00	112.00	118.00	127.00
16	23½	36½	30	120.00	130.00	138.00	148.00
18	25	39	32	157.00	169.00	180.00	192.00
20	27½	43	35	198.00	212.00	228.00	242.00
22	29½	46	37½	248.00	266.00	285.00	303.00
24	32	49½	40½	310.00	330.00	355.00	375.00

*All laterals reducing on run only carry the same dimensions face to face as straight size laterals. Sizes 18 inches and up, reducing on the branch, are made in two lengths, depending on the size of the branch.

†Reducing in run or branch.

All reducing "Y" or laterals, 16 inches and smaller, take the same center to face dimensions as the straight size fitting.

Flanged fittings will always be furnished faced only, unless otherwise ordered.

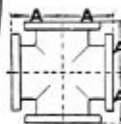
For drilling templates, see page 78.

STANDARD FLANGED FITTINGS FOR 125 POUNDS STEAM WORKING PRESSURE

Flanged Crosses



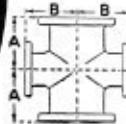
FIG. 250



Reducing Flanged Crosses



FIG. 251



Size Inches	Diameter of Flanges Inches	*Face to Face "AA" Inches	*Center to Face Inches		Price, Each			
			"A"	"B"	Straight		Reducing	
					With Faced Flanges	With Faced and Drilled Flanges	With Faced Flanges	With Faced and Drilled Flanges
1¼	4½	7½	3¾	3¾	\$ 6.75	7.95	.....	.....
1½	5	8	4	4	6.75	7.95	.....	.....
2	6	9	4½	4½	6.75	7.95	7.75	8.95
2½	7	10	5	5	6.95	8.15	8.00	9.20
3	7½	11	5½	5½	7.65	9.05	8.75	10.15
3½	8½	12	6	6	9.00	10.70	10.35	12.05
4	9	13	6½	6½	10.00	12.00	11.50	13.50
4½	9¼	14	7	7	12.00	14.00	13.75	15.75
5	10	15	7½	7½	13.75	15.75	15.75	17.75
6	11	16	8	8	16.75	19.25	19.25	21.75
7	12½	17	8½	8½	23.00	26.00	26.50	29.50
8	13½	18	9	9	26.50	29.75	30.50	33.75
9	15	20	10	10	37.50	42.00	43.00	47.50
10	16	22	11	11	42.00	47.50	48.00	53.50
12	19	24	12	12	61.50	67.50	71.00	77.00
14	21	28	14	14	91.00	98.50	105.00	112.50
15	22¼	29	14½	14½	103.00	112.00	118.00	127.00
16	23½	30	15	15	120.00	130.00	138.00	148.00
18	25	33	16½	16½	157.00	169.00	180.00	192.00
20	27½	36	18	18	198.00	212.00	228.00	242.00
22	29½	40	20	20	248.00	266.00	285.00	303.00
24	32	44	22	22	310.00	330.00	355.00	375.00

*All reducing crosses, 16 inches and smaller, take the same center to face dimensions as straight size crosses. All crosses reducing on the run only, take the same dimensions, center to face, as the largest straight size. Crosses, sizes 18 inches, and larger, reducing on the outlet, are made in two lengths, depending on the size of outlet.

Furnished faced only, unless otherwise ordered. Larger sizes made to order. Prices on application.

For drilling template, see page 78.

STANDARD COMPANION FLANGES FOR STEAM WORKING PRESSURE UP TO 125 POUND



FIG. 252



FIG. 253

Size Inches	No. 553 Cast Iron		No. 558 Ferrosteel		No. 560 Cast Steel		No. 556 Forged Steel	
	Faced Each	Faced and Drilled Each	Each Faced	Faced and Drilled Each	Faced Each	*Faced, Drilled and Spot Faced Each	Faced Each	Faced and Drilled Each
1 x 4	\$ 0.55	\$ 0.80	\$ 0.70	\$ 1.00	\$ 5.00	\$ 6.50	.....	.....
1½ x 4½	.60	.85	.75	1.05	5.40	7.00	.....	.....
1½ x 5	.65	.90	.80	1.10	5.90	7.50	.....	.....
2 x 6	.75	1.00	.95	1.25	6.90	8.50	\$10.40	\$11.00
2½ x 7	.85	1.10	1.05	1.35	7.30	9.50	11.80	13.00
3 x 7½	.95	1.25	1.20	1.55	8.70	11.00	13.70	15.00
3½ x 8½	1.20	1.55	1.50	1.95	12.10	14.50	17.60	19.00
4 x 9	1.35	1.80	1.70	2.25	14.80	18.50	18.30	20.00
4½ x 9½	1.45	1.90	1.80	2.35	15.80	19.50	20.30	22.00
5 x 10	1.60	2.05	2.00	2.55	16.80	20.50	22.30	24.00
6 x 11	2.00	2.50	2.50	3.10	20.40	24.00	25.40	27.00
7 x 12½	2.65	3.25	3.30	4.05	24.70	29.50	27.20	32.00
8 x 13½	3.10	3.80	3.90	4.75	27.00	32.00	32.00	35.00
9 x 15	3.85	4.65	4.80	5.80	29.50	35.50	37.00	40.00
10 x 16	4.50	5.50	5.65	6.85	34.50	40.50	45.00	48.00
12 x 19	6.50	7.65	8.15	9.55	46.00	53.00	56.00	60.00
14 x 21	9.00	10.35	11.25	13.00	55.50	63.00	75.50	80.00
15 x 21	11.50	13.20	14.50	16.50	64.00	74.00	.....	.....
15 x 22½	11.50	13.20	14.50	16.50	64.00	74.00	.....	.....
16 x 23½	13.50	15.30	17.00	19.00	78.00	89.00	.....	.....
18 x 25	16.00	18.00	20.00	22.50	98.00	110.00	.....	.....
20 x 27½	19.00	21.50	24.00	27.00	117.00	130.00	.....	.....
22 x 29½	22.00	25.00	27.50	31.00	140.00	155.00	.....	.....
24 x 32	27.00	30.50	34.00	38.00	165.00	180.00	.....	.....

*Cast Steel Flanges, when ordered faced and drilled, will always be furnished with bolt holes spot faced at the prices given above.

STANDARD CAST IRON BLIND FLANGES

16 Inch O. D. and Smaller

19 Inch O. D. and Larger



FIG. 254



FIG. 255

Size of Valve or Fitting and O.D. of Flange Inches	Faced and Drilled Each		Size of Valve or Fitting and O.D. of Flange Inches	Faced and Drilled Each		Size of Valve or Fitting and O.D. of Flange Inches	Faced and Drilled Each	
	Faced Each	Faced and Drilled Each		Faced Each	Faced and Drilled Each		Faced Each	Faced and Drilled Each
2 x 6	\$ 1.15	\$ 1.40	8 x 13½	\$ 4.60	\$ 5.30	22 x 29½	\$33.00	\$36.00
2½ x 7	1.30	1.55	9 x 15	5.75	6.55	24 x 32	40.00	43.50
3 x 7½	1.40	1.70	10 x 16	6.75	7.75	26 x 34½	62.50	70.00
3½ x 8½	1.80	2.15	12 x 19	9.75	10.90	28 x 36½	77.50	85.00
4 x 9	2.00	2.45	14 x 21	13.50	14.85	30 x 38¾	90.00	100.00
4½ x 9½	2.20	2.65	15 x 22½	17.00	18.70	32 x 41¾	110.00	120.00
5 x 10	2.40	2.85	16 x 23½	20.00	21.80	34 x 43¾	122.50	135.00
6 x 11	3.00	3.50	18 x 25	24.00	26.00	36 x 46	137.50	150.00
7 x 12½	4.00	4.60	20 x 27½	28.00	30.50			

Furnished smooth face and not drilled, unless otherwise specified.
For drilling templates, see page 78.

STANDARD REDUCING COMPANION FLANGES

FOR 125 POUNDS WORKING STEAM PRESSURE

WITH RIBS

These flanges, used in connection with straight or reducing fittings, enable us to fill orders more promptly. Customers who desire fittings reduced in this manner will please specify "reduce by flanges if necessary."

They will always be of the same thickness as the regular companion flanges of corresponding outside diameters, and drilled to the template corresponding to outside diameter, unless otherwise ordered.

In ordering reducing companion flanges always give the screwed or reduced size first, then the outside diameter of flange wanted; for instance, if a reducing flange is wanted to connect a 6-inch pipe to a 9-inch flanged valve or fitting having a 15-inch O. D. flange, order a 6x15-inch reducing flange. This will clearly avoid the confusion often caused by orders incorrectly calling for a 9x6 or a 6x9-inch flange.

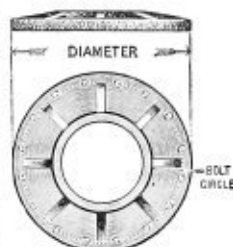


FIG. 256

Size, Inches	Price, Each		Size, Inches	Price, Each		Size, Inches	Price, Each	
	Faced	Faced and Drilled		Faced	Faced and Drilled		Faced	Faced and Drilled
1½ x 7	\$ 1.45	\$ 1.70	4 x 12½	\$ 4.40	\$ 5.00	9x21	\$15.00	\$16.35
2 x 7	1.45	1.70	4½ x 12½	4.40	5.00	10x21	15.00	16.35
1½ x 7½	1.55	1.85	5 x 12½	4.40	5.00	12x21	15.00	16.35
2 x 7½	1.55	1.85	6 x 12½	4.40	5.00	8x22½	19.00	20.70
2½ x 7½	1.55	1.85	2 x 13½	5.10	5.80	10x22½	19.00	20.70
2 x 8½	2.00	2.35	2½ x 13½	5.10	5.80	12x22½	19.00	20.70
2½ x 8½	2.00	2.35	3 x 13½	5.10	5.80	14x22½	19.00	20.70
3 x 8½	2.00	2.35	4 x 13½	5.10	5.80	10x23½	22.00	23.80
2 x 9	2.20	2.65	5 x 13½	5.10	5.80	12x23½	22.00	23.80
2½ x 9	2.20	2.65	6 x 13½	5.10	5.80	14x23½	22.00	23.80
3 x 9	2.20	2.65	7 x 13½	5.10	5.80	15x23½	22.00	23.80
3½ x 9	2.20	2.65	6 x 15	6.35	7.15	12x25	26.50	28.50
2½ x 9½	2.40	2.85	7 x 15	6.35	7.15	14x25	26.50	28.50
3 x 9½	2.40	2.85	8 x 15	6.35	7.15	15x25	26.50	28.50
3½ x 9½	2.40	2.85	2½ x 16	7.45	8.45	16x25	26.50	28.50
4 x 9½	2.40	2.85	3 x 16	7.45	8.45	14x27½	31.00	33.50
2 x 10	2.65	3.10	3½ x 16	7.45	8.45	15x27½	31.00	33.50
2½ x 10	2.65	3.10	4 x 16	7.45	8.45	16x27½	31.00	33.50
3 x 10	2.65	3.10	5 x 16	7.45	8.45	18x27½	31.00	33.50
3½ x 10	2.65	3.10	6 x 16	7.45	8.45	15x29½	36.00	39.00
4 x 10	2.65	3.10	7 x 16	7.45	8.45	16x29½	36.00	39.00
4½ x 10	2.65	3.10	8 x 16	7.45	8.45	18x29½	36.00	39.00
2 x 11	3.30	3.80	9 x 16	7.45	8.45	20x29½	36.00	39.00
2½ x 11	3.30	3.80	6 x 19	10.75	11.90	14x32	44.00	47.50
3 x 11	3.30	3.80	7 x 19	10.75	11.90	16x32	44.00	47.50
3½ x 11	3.30	3.80	8 x 19	10.75	11.90	18x32	44.00	47.50
4 x 11	3.30	3.80	9 x 19	10.75	11.90	20x32	44.00	47.50
4½ x 11	3.30	3.80	10 x 19	10.75	11.90	.....	.....	.....
5 x 11	3.30	3.80	8 x 21	15.00	16.35	.....	.....	.....

Furnished smooth faced and not drilled, unless otherwise specified.

For drilling Template, see page 78.

TEMPLATES FOR DRILLING

STANDARD FLANGED VALVES AND FLANGED FITTINGS

Size, Inches	Diameter of Flanges, Inches	Thickness of Flanges, Inches	Bolt Circle, Inches	Number of Bolts	Size of Bolts, Inches	Length of Bolts, Inches
1	4	$\frac{7}{16}$	3	4	$\frac{7}{16}$	$1\frac{1}{2}$
$1\frac{1}{4}$	$4\frac{1}{2}$	$\frac{1}{2}$	$3\frac{3}{8}$	4	$\frac{7}{16}$	$1\frac{1}{2}$
$1\frac{1}{2}$	5	$\frac{9}{16}$	$3\frac{3}{8}$	4	$\frac{1}{2}$	$1\frac{3}{4}$
2	6	$\frac{5}{8}$	$4\frac{3}{4}$	4	$\frac{5}{8}$	2
$2\frac{1}{2}$	7	$1\frac{1}{16}$	$5\frac{1}{2}$	4	$\frac{5}{8}$	$2\frac{1}{4}$
3	$7\frac{1}{2}$	$\frac{3}{4}$	6	4	$\frac{5}{8}$	$2\frac{1}{2}$
$3\frac{1}{2}$	$8\frac{1}{2}$	$1\frac{1}{16}$	7	4	$\frac{5}{8}$	$2\frac{1}{2}$
4	9	$1\frac{1}{16}$	$7\frac{1}{2}$	8	$\frac{5}{8}$	$2\frac{3}{4}$
$4\frac{1}{2}$	$9\frac{1}{4}$	$1\frac{1}{16}$	$7\frac{3}{4}$	8	$\frac{3}{4}$	$2\frac{3}{4}$
5	10	$1\frac{1}{16}$	$8\frac{1}{2}$	8	$\frac{3}{4}$	$2\frac{3}{4}$
6	11	1	$9\frac{1}{2}$	8	$\frac{3}{4}$	3
7	$12\frac{1}{2}$	$1\frac{1}{16}$	$10\frac{3}{4}$	8	$\frac{3}{4}$	3
8	$13\frac{1}{2}$	$1\frac{1}{8}$	$11\frac{3}{4}$	8	$\frac{3}{4}$	$3\frac{1}{4}$
9	15	$1\frac{1}{8}$	$13\frac{1}{4}$	12	$\frac{3}{4}$	$3\frac{1}{4}$
10	16	$1\frac{3}{16}$	$14\frac{1}{4}$	12	$\frac{7}{8}$	$3\frac{1}{2}$
12	19	$1\frac{1}{4}$	17	12	$\frac{7}{8}$	$3\frac{1}{2}$
14	21	$1\frac{3}{8}$	$18\frac{3}{4}$	12	1	4
15	$22\frac{1}{4}$	$1\frac{3}{8}$	20	16	1	4
16	$23\frac{1}{2}$	$1\frac{7}{16}$	$21\frac{1}{4}$	16	1	4
18	25	$1\frac{9}{16}$	$22\frac{3}{4}$	16	$1\frac{1}{8}$	$4\frac{1}{2}$
20	$27\frac{1}{2}$	$1\frac{11}{16}$	25	20	$1\frac{1}{8}$	$4\frac{3}{4}$
22	$29\frac{1}{2}$	$1\frac{3}{16}$	$27\frac{1}{4}$	20	$1\frac{1}{8}$	5
24	32	$1\frac{7}{8}$	$29\frac{1}{2}$	20	$1\frac{1}{8}$	$5\frac{1}{4}$
26	$34\frac{1}{4}$	2	$31\frac{3}{4}$	24	$1\frac{1}{4}$	$5\frac{1}{4}$
28	$36\frac{1}{2}$	$2\frac{1}{16}$	34	28	$1\frac{1}{4}$	$5\frac{1}{2}$
30	$38\frac{3}{4}$	$2\frac{1}{8}$	36	28	$1\frac{3}{8}$	$5\frac{3}{4}$

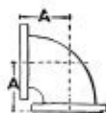
EXTRA HEAVY FLANGED FITTINGS

FOR 250 POUNDS WORKING STEAM PRESSURES

Flanged Elbow



FIG. 257



Flanged 45° Elbow



FIG. 258



Size, Inches	Diam. of Flanges, Inches	Center to Face, Inches	Price, Elbow		Size, Inches	Diam. of Flanges, Inches	Center to Face, Inches	Price, 45° Elbow	
			Faced, Each	Faced and Drilled, Each				Faced, Each	Faced and Drilled, Each
1 1/4	5	4 1/4	\$ 4.50	\$ 5.40	1 1/4	5	2 1/2	\$ 5.00	\$ 5.90
1 1/2	6	4 1/2	4.50	5.40	1 1/2	6	2 3/4	5.00	5.90
2	6 1/2	5	4.50	5.40	2	6 1/2	3	5.00	5.90
2 1/2	7 1/2	5 1/2	4.75	5.65	2 1/2	7 1/2	3 1/2	5.25	6.15
3	8 1/4	6	5.15	6.25	3	8 1/4	3 3/4	5.65	6.75
3 1/2	9	6 1/2	6.10	7.35	3 1/2	9	4	6.75	8.00
4	10	7	6.75	8.25	4	10	4 1/2	7.50	9.00
4 1/2	10 1/2	7 1/2	8.25	9.75	4 1/2	10 1/2	4 3/4	9.00	10.50
5	11	8	9.35	10.85	5	11	5	10.35	11.85
6	12 1/2	8 1/2	11.40	13.40	6	12 1/2	5 1/2	12.50	14.50
7	14	9	15.75	18.00	7	14	6	16.50	18.75
8	15	10	18.00	20.50	8	15	6	19.00	21.50
9	16 1/4	10 1/2	25.50	28.85	9	16 1/4	6 1/2	26.75	30.10
10	17 1/2	11 1/2	28.50	32.50	10	17 1/2	7	30.00	34.00
12	20 1/2	13	42.00	46.50	12	20 1/2	8	44.00	48.50
14	23	15	62.00	67.50	14	23	8 1/2	62.00	67.50
15	24 1/2	15 1/2	70.00	77.00	15	24 1/2	9	70.00	77.00
16	25 1/2	16 1/2	82.00	90.00	16	25 1/2	9 1/2	82.00	90.00
18	28	18	106.00	115.00	18	28	10	106.00	115.00
20	30 1/2	19 1/2	135.00	145.00	20	30 1/2	10 1/2	135.00	145.00
22	33	20 1/2	170.00	183.00	22	33	11	170.00	183.00
24	36	22 1/2	210.00	225.00	24	36	12	210.00	225.00

Furnished faced only, unless otherwise ordered.

Made to order of Ferrosteel, sizes 3 1/2 inch and smaller, at an advance of 50 per cent, and sizes 4 inch and larger, at an advance of 25 per cent.

For drilling templates, see page 93.

EXTRA HEAVY FLANGED FITTINGS FOR 250 POUNDS WORKING STEAM PRESSURE

Reducing Taper Elbows

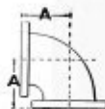


FIG. 259

Size Inches	Diameter of Flanges Inches	Center to Face "A" Inches	Price, Each		Size Inches	Diameter of Flanges Inches	Center to Face "A" Inches	Price, Each	
			With Faced Flanges	With Faced and Drilled Flanges				With Faced Flanges	With Faced and Drilled Flanges
2 x 1 1/4	6 1/2 x 5	5	\$ 9.00	9.90	7 x 6	14 x 12 1/2	9	\$ 31.50	33.75
2 x 1 1/2	6 1/2 x 6	5	9.00	9.90	8 x 4	15 x 10	10	36.00	38.50
2 1/2 x 1 1/2	7 1/2 x 6	5 1/2	9.50	10.40	8 x 5	15 x 11	10	36.00	38.50
2 1/2 x 2	7 1/2 x 6 1/2	5 1/2	9.50	10.40	8 x 6	15 x 12 1/2	10	36.00	38.50
3 x 1 1/2	8 1/4 x 6	6	10.25	11.35	8 x 7	15 x 14	10	36.00	38.50
3 x 2	8 1/4 x 6 1/2	6	10.25	11.35	10 x 5	17 1/2 x 11	11 1/2	57.00	61.00
3 x 2 1/2	8 1/4 x 7 1/2	6	10.25	11.35	10 x 6	17 1/2 x 12 1/2	11 1/2	57.00	61.00
3 1/2 x 2	9 x 6 1/2	6 1/2	12.25	13.50	10 x 7	17 1/2 x 14	11 1/2	57.00	61.00
3 1/2 x 2 1/2	9 x 7 1/2	6 1/2	12.25	13.50	10 x 8	17 1/2 x 15	11 1/2	57.00	61.00
3 1/2 x 3	9 x 8 1/4	6 1/2	12.25	13.50	12 x 7	20 1/2 x 14	13	84.00	88.50
4 x 2	10 x 6 1/2	7	13.50	15.00	12 x 8	20 1/2 x 15	13	84.00	88.50
4 x 2 1/2	10 x 7 1/2	7	13.50	15.00	12 x 9	20 1/2 x 16 1/4	13	84.00	88.50
4 x 3	10 x 8 1/4	7	13.50	15.00	12 x 10	20 1/2 x 17 1/2	13	84.00	88.50
4 x 3 1/2	10 x 9	7	13.50	15.00	14 x 6	23 x 12 1/2	15	105.00	110.50
5 x 2 1/2	11 x 7 1/2	8	18.75	20.25	14 x 10	23 x 17 1/2	15	105.00	110.50
5 x 3	11 x 8 1/4	8	18.75	20.25	14 x 12	23 x 20 1/2	15	105.00	110.50
5 x 4	11 x 10	8	18.75	20.25	15 x 6	24 1/2 x 12 1/2	15 1/2	120.00	127.00
6 x 3	12 1/2 x 8 1/4	8 1/2	22.75	24.75	15 x 10	24 1/2 x 17 1/2	15 1/2	120.00	127.00
6 x 3 1/2	12 1/2 x 9	8 1/2	22.75	24.75	15 x 12	24 1/2 x 20 1/2	15 1/2	120.00	127.00
6 x 4	12 1/2 x 10	8 1/2	22.75	24.75	16 x 8	25 1/2 x 15	16 1/2	135.00	143.00
6 x 4 1/2	12 1/2 x 10 1/2	8 1/2	22.75	24.75	16 x 10	25 1/2 x 17 1/2	16 1/2	135.00	143.00
6 x 5	12 1/2 x 11	8 1/2	22.75	24.75	16 x 12	25 1/2 x 20 1/2	16 1/2	135.00	143.00
7 x 4	14 x 10	9	31.50	33.75	16 x 14	25 1/2 x 23	16 1/2	135.00	143.00
7 x 5	14 x 11	9	31.50	33.75	.....	.....	.....	.....	.....

Furnished faced only, unless otherwise ordered.

Flanged Taper Reducing Elbows not listed above will be made to order at a special price.

Made to order of Ferrosteeel, sizes 3 1/2 inch and smaller at an advance of 50 per cent, and sizes 4 inch and larger, at an advance of 25 per cent.

For drilling templates, see page 93.

EXTRA HEAVY FLANGED FITTINGS FOR 250 POUNDS WORKING STEAM PRESSURE

Long Radius Elbow



FIG. 260

Square Base Elbows



FIG. 261

Round Base Elbows

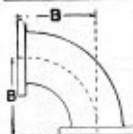


FIG. 262

LONG RADIUS ELBOWS

BASE ELBOWS

Size Ins.	Center to Face Inches	Radius Inches	Diam. of Flanges Inches	Price, Each		Size Inches	Diam. of Flanges Except Base Flange Inches	Center to Face Inches	Center to Face of Round or Square Base Inches	Diam. of Base Flanges, Inches	Price, Each		Facing and Drill- ing Base Flange
				With Faced Flanges	With Faced and Drilled Flanges						Faced Except Base Flange	Faced and Drilled Except Base Flange	
2	6 1/2	5 1/4	6 1/4	\$ 7.50	\$ 8.85	...	...	...	...	...	...	...	...
2 1/2	7	5 7/8	7 1/2	8.00	9.35	...	...	...	...	...	...	...	...
3	7 3/4	6 1/4	8 1/4	8.60	10.25	...	...	...	...	...	...	...	...
3 1/2	8 1/2	6 7/8	9	10.25	12.15	...	...	...	...	...	...	...	...
4	9	7 3/8	10	11.25	13.50	4	10	7	7	6 1/2	\$13.50	\$15.00	\$4.50
4 1/2	9 1/2	7 3/4	10 1/2	13.75	16.00	4 1/2	10 1/2	7 1/2	7 1/2	6 1/2	16.50	18.00	4.50
5	10 1/4	8 1/2	11	15.50	17.75	5	11	8	7 1/2	7 1/2	18.75	20.25	5.25
6	11 1/2	9 5/8	12 1/2	19.00	22.00	6	12 1/2	8 1/2	8	7 1/2	22.75	24.75	5.25
7	12 3/4	10 7/8	14	26.50	29.85	7	14	9	8 3/4	7 1/2	31.50	33.75	5.25
8	14	12	15	30.00	33.75	8	15	10	9 1/4	10	36.00	38.50	7.50
9	15 1/4	13	16 1/4	42.50	47.50	9	16 1/4	10 1/2	10	10	51.00	54.35	7.50
10	16 1/2	14 1/8	17 1/2	47.75	53.75	10	17 1/2	11 1/2	10 1/2	10	57.00	61.00	7.50
12	19	16 1/2	20 1/2	70.00	76.75	12	20 1/2	13	11	12 1/2	84.00	88.50	11.00
14	21 1/2	18 3/4	23	103.50	111.75	14	23	15	14	12 1/2	105.00	110.50	11.00
15	22 3/4	20	24 1/2	117.00	127.00	15	24 1/2	15 1/2	14 1/2	12 1/2	120.00	127.00	11.00
16	24	21 1/4	25 1/2	137.00	149.00	16	25 1/2	16 1/2	15 1/4	12 1/2	135.00	143.00	11.00



*The measurement across the flat edges of square base flange is the same as the diameter of the round base flange.

Furnished faced only unless otherwise ordered.

Sizes above 16-inch, prices on application.

Long radius elbows made of Ferrosteeel, sizes 3 1/2 inches and smaller, at an advance of 50 per cent, and sizes larger over 4 inches, at an advance of 25 per cent.

Base elbows, made of Ferrosteeel, at an advance of 25 per cent.

BASE TEES

Base tees made to order. Prices on application.

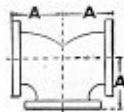
For drilling template, see page 93.

EXTRA HEAVY FLANGED FITTINGS FOR 250 POUNDS STEAM WORKING PRESSURE

Double Branch Elbows



FIG. 263



Reducing Double Branch Elbows



FIG. 264

Size Inches	"AA" Face to Face Inches	"A" Center to Face Inches	Diameter of Flanges Inches	Straight		Reducing	
				Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
4	14	7	10	\$ 35.75	38.00	39.75	42.00
5	16	8	11	42.75	45.00	47.75	50.00
6	17	8½	12½	49.50	52.50	54.50	57.50
7	18	9	14	56.50	60.00	62.50	66.00
8	20	10	15	66.25	70.00	73.75	77.50
10	23	11½	17½	84.00	90.00	94.00	100.00
12	26	13	20½	108.25	115.00	118.25	125.00
14	30	15	23	141.75	150.00	156.75	165.00
16	33	16½	25½	168.00	180.00	188.00	200.00

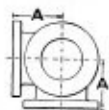
Made to order of Ferrosteel at an advance of 25 per cent.

Lists given above for Reducing Elbows are for Fittings on the branches with branches same size. Furnished faced only, unless otherwise ordered.

Side Outlet Elbows



FIG. 265



Reducing Side Outlet Elbows



FIG. 266

Size Inches	"A" Center to Face Inches	Diameter of Flanges Inches	Straight		Reducing	
			Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
4	7	10	\$ 35.75	38.00	39.75	42.00
5	8	11	37.75	40.00	41.75	44.00
6	8½	12½	42.00	45.00	47.00	50.00
7	9	14	51.75	55.00	56.75	60.00
8	10	15	61.25	65.00	67.25	71.00
10	11½	17½	89.00	95.00	99.00	105.00
12	13	20½	113.25	120.00	123.25	130.00
14	15	23	146.75	155.00	161.75	170.00
16	16½	25½	168.00	180.00	183.00	195.00

Made to order of Ferrosteel at an advance of 25 per cent.

Orders should specify whether outlet is to be on radial or intersecting center lines. Furnished faced only, unless otherwise ordered. For drilling template, see page 93.

EXTRA HEAVY FLANGED FITTINGS

FOR 250 POUNDS WORKING STEAM PRESSURE

Flanged Tee

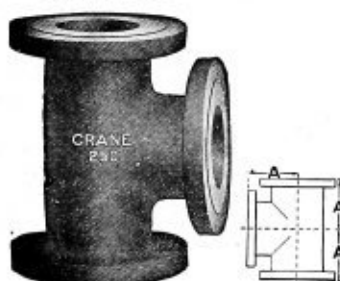


FIG. 267

Reducing Flanged Tee
Reducing to Run or Branch

FIG. 268

Size, Inches	Diameter of Flanges, Inches	"A" Center to Face, Inches	"AA" Face to Face, Inches	Price, Tees		Size, Inches	Price, Red. Tees	
				Faced, Each	Faced and Drilled, Each		Faced, Each	Faced and Drilled, Each
1 1/4	5	4 1/4	8 1/2	\$ 6.50	\$ 7.85	.....	.....	.....
1 1/2	6	4 1/2	9	6.50	7.85	1 1/2	\$ 7.50	\$ 8.85
2	6 1/2	5	10	6.50	7.85	2	7.50	8.85
2 1/2	7 1/2	5 1/2	11	6.90	8.25	2 1/2	8.00	9.35
3	8 1/4	6	12	7.50	9.15	3	8.60	10.25
3 1/2	9	6 1/2	13	8.90	10.80	3 1/2	10.25	12.15
4	10	7	14	9.75	12.00	4	11.25	13.50
4 1/2	10 1/2	7 1/2	15	12.00	14.25	4 1/2	13.75	16.00
5	11	8	16	13.50	15.75	5	15.50	17.75
6	12 1/2	8 1/2	17	16.50	19.50	6	19.00	22.00
7	14	9	18	23.00	26.35	7	26.50	29.85
8	15	10	20	26.00	29.75	8	30.00	33.75
9	16 1/4	10 1/2	21	37.00	42.00	9	42.50	47.50
10	17 1/2	11 1/2	22	41.50	47.50	10	47.75	53.75
12	20 1/2	13	26	61.00	67.75	12	70.00	76.75
14	23	15	30	90.00	98.25	14	103.50	111.75
15	24 1/2	15 1/2	31	102.00	112.00	15	117.00	127.00
16	25 1/2	16 1/2	32	119.00	131.00	16	137.00	149.00
18	28	18	36	154.00	168.00	18	177.00	191.00
20	30 1/2	19 1/2	39	195.00	210.00	20	225.00	240.00
22	33	20 1/2	41	247.00	267.00	22	285.00	305.00
24	36	22 1/2	45	305.00	328.00	24	350.00	373.00

Furnished faced only, unless otherwise ordered.

Made to order of Ferrosteel, sizes 3 1/2 inch and smaller, at an advance of 50 per cent, and sizes 4 inch and larger, at an advance of 25 per cent.

For drilling template, see page 93.

EXTRA HEAVY FLANGED FITTINGS FOR 250 POUNDS STEAM WORKING PRESSURE

Single Sweep Tees



FIG. 269

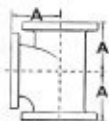
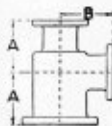
Reducing Single Sweep Tees
Reducing in Run or Branch

FIG. 270



Size Inches	Diameter of Flanges Inches	*Face to Face "AA" Inches	*Center to Face Inches		Price, Each			
			"A"	"B"	Straight		†Reducing	
					With Faced Flanges	With Faced and Drilled Flanges	With Faced Flanges	With Faced and Drilled Flanges
2	6½	10	5	5	\$ 7.50	8.85	....	....
2½	7½	11	5½	5½	8.00	9.35	9.15	10.50
3	8½	12	6	6	8.60	10.25	9.90	11.55
3½	9	13	6½	6½	10.25	12.15	11.75	13.65
4	10	14	7	7	11.25	13.50	13.00	15.25
4½	10½	15	7½	7½	13.75	16.00	15.75	18.00
5	11	16	8	8	15.50	17.75	17.85	20.10
6	12½	17	8½	8½	19.00	22.00	22.00	25.00
7	14	18	9	9	26.50	29.85	30.50	33.85
8	15	20	10	10	30.00	33.75	34.50	38.25
9	16½	21	10½	10½	42.50	47.50	49.00	54.00
10	17½	23	11½	11½	47.75	53.75	55.00	61.00
12	20½	26	13	13	70.00	76.75	80.00	86.75
14	23	30	15	15	103.50	111.75	119.00	127.25
15	24½	31	15½	15½	117.00	127.00	135.00	145.00
16	25½	33	16½	16½	137.00	149.00	158.00	170.00
18	28	36	18	18	177.00	191.00	204.00	218.00
20	30½	39	19½	19½	225.00	240.00	260.00	275.00
22	33	41	20½	20½	285.00	305.00	327.00	347.00
24	36	45	22½	22½	350.00	373.00	402.00	425.00

*All reducing tees, 16 inches and smaller, take the same center to face dimensions as straight size tees. All tees reducing on the run only, take the same dimensions, center to face, as the largest straight size. Tees, sizes 18 inches and larger, reducing on the outlet, are made in two lengths, depending on the size of outlet.

†Reducing in run or branch.

Furnished faced only, unless otherwise ordered. Reducing single sweep tees made to order only. Single sweep tees not made with the side opening larger than the run.

Bullheads or tees having outlet larger than the run will be the same length center to face of all openings as a tee with all openings of the size of the outlet. For example, a 12x12x18-inch tee will be governed by the dimensions of the 18-inch long body tee, namely, 18 inches center to face of all openings and 36 inches face to face.

Made to order of Ferrosteeel, sizes 3½ inch and smaller, at an advance of 50 per cent, and sizes 4 inch and larger, at an advance of 25 per cent.

For drilling template, see page 93.

EXTRA HEAVY FLANGED FITTINGS FOR 250 POUNDS WORKING STEAM PRESSURE

Double Sweep Tees

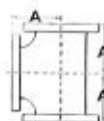


FIG. 271

Reducing Double Sweep Tees



FIG. 272



Size Inches	"A" Center to Face Inches	"AA" Face to Face Inches	Diameter of Flanges Inches	Straight		*Reducing	
				Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
2	5	10	6½	\$ 7.50	8.85		
2½	5½	11	7½	8.00	9.35	\$ 9.15	10.50
3	6	12	8½	8.60	10.25	9.90	11.55
3½	6½	13	9	10.25	12.15	11.75	13.65
4	7	14	10	11.25	13.50	13.00	15.25
4½	7½	15	10½	13.75	16.00	15.75	18.00
5	8	16	11	15.50	17.75	17.85	20.10
6	8½	17	12½	19.00	22.00	22.00	25.00
7	9	18	14	26.50	29.85	30.50	33.85
8	10	20	15	30.00	33.75	34.50	38.25
9	10½	21	16¼	42.50	47.50	49.00	54.00
10	11½	23	17½	47.75	53.75	55.00	61.00
12	13	26	20½	70.00	76.75	80.00	86.75
14	15	30	23	103.50	111.75	119.00	127.25
15	15½	31	24½	117.00	127.00	135.00	145.00
16	16½	33	25½	137.00	149.00	158.00	170.00
18	18	36	28	177.00	191.00	204.00	218.00
20	19½	39	30½	225.00	240.00	260.00	275.00
22	20½	41	33	285.00	305.00	327.00	347.00
24	22½	45	36	350.00	373.00	402.00	425.00

Furnished faced only, unless otherwise ordered.

Made to order of Ferroteel, sizes 3½ inch and smaller, at an advance of 50 per cent, and sizes 4 inch and larger, at an advance of 25 per cent.

*Double Sweep Tees are not made reducing on the run. Should such Tees, however, be wanted we will alter patterns (which will be expensive and change the dimensions) and charge at a special price. Dimensions on request. We can only increase branch (outlet) within a reasonable limit, which must be regulated by our patterns.

For drilling template, see page 93.

EXTRA HEAVY FLANGED FITTINGS

FOR 250 POUNDS WORKING STEAM PRESSURE

Side Outlet Tees



FIG. 273

Reducing Side Outlet Tees

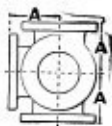


FIG. 274

Size Inches	"AA" Face to Face Inches	"A" Center to Face Inches	Diameter of Flanges Inches	Straight		Reducing	
				Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
4	14	7	10	\$ 42.00	45.00	47.00	50.00
5	16	8	11	47.00	50.00	52.00	55.00
6	17	8½	12½	53.50	57.50	59.00	63.00
7	18	9	14	63.00	67.50	70.50	75.00
8	20	10	15	72.50	77.50	80.00	85.00
10	23	11½	17½	102.00	110.00	112.00	120.00
12	26	13	20½	131.00	140.00	146.00	155.00
14	30	15	23	159.00	170.00	174.00	185.00
16	33	16½	25½	184.00	200.00	204.00	220.00

Made to order of Ferrosteel at an advance of 25 per cent.

Furnished faced only, unless otherwise ordered.

For drilling template, see page 93.

EXTRA HEAVY FLANGED FITTINGS FOR 250 POUNDS WORKING STEAM PRESSURE

Laterals

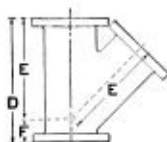


FIG. 275

Reducing Laterals
Reducing in Run or Branch

FIG. 276

Size, Inches	Diameter of Flanges, Inches	Center to Face of Run or Outlet, Inches	"D" Face to Face of Run, Inches	Price, Laterals		Size, Inches	Price, Red, Laterals	
				Faced, Each	Faced and Drilled, Each		Faced, Each	Faced and Drilled, Each
1 1/4	5	7 1/4	9 1/2	\$ 10.00	\$ 11.80	....	.....	.....
1 1/2	6	8 1/2	11	10.00	11.80	....	.....	.....
2	6 1/2	9	11 1/2	10.00	11.80	2	\$ 11.50	\$ 13.30
2 1/2	7 1/2	10 1/2	13	10.50	12.30	2 1/2	12.00	13.80
3	8 1/4	11	14	11.50	13.75	3	13.25	15.50
3 1/2	9	12 1/2	15 1/2	13.50	16.00	3 1/2	15.50	18.00
4	10	13 1/2	16 1/2	15.00	18.00	4	17.00	20.00
4 1/2	10 1/2	14 1/2	18	18.00	21.00	4 1/2	21.00	24.00
5	11	15	18 1/2	20.50	23.50	5	23.50	26.50
6	12 1/2	17 1/2	21 1/2	25.00	29.00	6	29.00	33.00
7	14	19	23 1/2	35.00	39.50	7	40.00	44.50
8	15	20 1/2	25 1/2	40.00	45.00	8	46.00	51.00
9	16 1/4	22 1/2	27 1/2	56.00	62.75	9	65.00	71.75
10	17 1/2	24	29 1/2	63.00	71.00	10	72.00	80.00
12	20 1/2	27 1/2	33 1/2	92.00	101.00	12	106.00	115.00
14	23	31	37 1/2	136.00	147.00	14	158.00	169.00
15	24 1/2	33	39 1/2	155.00	169.00	15	177.00	191.00
16	25 1/2	34 1/2	42	180.00	196.00	16	207.00	223.00
18	28	37 1/2	45 1/2	235.00	253.00	18	270.00	288.00
20	30 1/2	40 1/2	49	300.00	320.00	20	345.00	365.00
22	33	43 1/2	53	375.00	401.00	22	430.00	456.00
24	36	47 1/2	57 1/2	465.00	495.00	24	535.00	565.00

Reducing laterals made to order only.

Made to order of Ferrosteel, sizes 3 1/2 inch and smaller, at an advance of 50 per cent, and sizes 4 inch and larger, at an advance of 25 per cent.

Furnished faced only, unless otherwise ordered.

For drilling template, see page 93.

**EXTRA HEAVY FLANGED FITTINGS
FOR 250 POUNDS WORKING STEAM PRESSURE**

Flanged Crosses

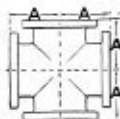


FIG. 277

Reducing Flanged Crosses



FIG. 278

Size, Inches	Diameter of Flanges, Inches	"A" Center to Face, Inches	"AA" Face to Face, Inches	Price, Crosses		Size, Inches	Price, Red, Crosses	
				Faced, Each	Faced and Drilled, Each		Faced, Each	Faced and Drilled, Each
1½	5	4¼	8½	\$ 10.00	\$ 11.80	.....	.....	.....
1½	6	4½	9	10.00	11.80	.....	.....	.....
2	6½	5	10	10.00	11.80	2	\$ 11.50	\$ 13.30
2½	7½	5½	11	10.50	12.30	2½	12.00	13.80
3	8¼	6	12	11.50	13.75	3	13.25	15.50
3½	9	6½	13	13.50	16.00	3½	15.50	18.00
4	10	7	14	15.00	18.00	4	17.00	20.00
4½	10½	7½	15	18.00	21.00	4½	21.00	24.00
5	11	8	16	20.50	23.50	5	23.50	26.50
6	12½	8½	17	25.00	29.00	6	29.00	33.00
7	14	9	18	35.00	39.50	7	40.00	44.50
8	15	10	20	40.00	45.00	8	46.00	51.00
9	16¼	10½	21	56.00	62.75	9	65.00	71.75
10	17½	11½	23	63.00	71.00	10	72.00	80.00
12	20½	13	26	92.00	101.00	12	106.00	115.00
14	23	15	30	136.00	147.00	14	158.00	169.00
15	24½	15½	31	155.00	169.00	15	177.00	191.00
16	25½	16½	33	180.00	196.00	16	207.00	223.00
18	28	18	36	235.00	253.00	18	270.00	288.00
20	30½	19½	39	300.00	320.00	20	345.00	365.00
22	33	20½	41	375.00	401.00	22	430.00	456.00
24	36	22½	45	405.00	495.00	24	535.00	565.00

Reducing crosses made to order only.

Made to order of Ferrosteel, sizes 3½ inch and smaller, at an advance of 50 per cent, and sizes 4 inch and larger, at an advance of 25 per cent.

Furnished faced only, unless otherwise ordered.

For drilling template, see page 93.

EXTRA HEAVY COMPANION FLANGES

FOR 250 POUNDS WORKING STEAM PRESSURE

Back View, Showing Hub



FIG. 279

Raised Face



FIG. 280

CAST IRON FERROSTEEL CAST STEEL FORGED STEEL
AND MALLEABLE IRON

Size Inches	No. 151 E Cast Iron		No. 251 E Ferroteel		No. 281 D Cast Steel		No. 291 E Forged Steel	
	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each	Faced Each	Faced, Drilled and Spot Faced Each	Faced Each	Faced and Drilled Each
1 x 4½	\$0.95	\$1.30	\$1.20	\$1.65	\$5.00	\$6.50	\$7.50	\$8.00
1¼ x 5	1.00	1.35	1.25	1.70	5.40	7.00	8.40	9.00
1½ x 6	1.10	1.45	1.35	1.80	5.90	7.50	9.40	10.00
2 x 6½	1.25	1.60	1.55	2.00	6.90	8.50	10.40	11.00
2½ x 7½	1.40	1.75	1.75	2.20	7.30	9.50	11.80	13.00
3 x 8¼	1.60	2.05	2.00	2.55	8.70	12.00	13.70	15.00
3½ x 9	2.00	2.55	2.50	3.20	12.10	15.50	17.60	19.00
4 x 10	2.25	2.95	2.80	3.70	14.80	18.50	18.30	20.00
4½ x 10½	2.40	3.10	3.00	3.90	15.80	19.50	20.30	22.00
5 x 11	2.65	3.35	3.30	4.20	16.80	20.50	22.30	24.00
6 x 12½	3.30	4.05	4.10	5.05	20.40	25.00	25.40	27.00
7 x 14	4.40	5.30	5.50	6.60	24.70	30.50	27.20	32.00
8 x 15	5.10	6.15	6.40	7.70	27.00	33.00	32.00	35.00
9 x 16¼	6.30	7.50	7.90	9.40	29.50	35.50	37.00	40.00
10 x 17½	7.40	8.90	9.25	11.00	34.50	41.50	45.00	48.00
12 x 20½	10.75	12.50	13.50	15.50	46.00	54.00	56.00	60.00
14 x 23	15.00	17.00	18.50	21.00	55.50	65.00	75.50	80.00
15 x 24½	19.00	21.50	24.00	27.00	64.00	75.00	84.00	90.00
16 x 25½	22.25	25.00	28.00	31.00	78.00	90.00	93.00	100.00
18 x 28	26.00	29.00	32.50	36.00	98.00	111.00	118.00	125.00
20 x 30½	31.00	35.00	39.00	44.00	117.00	131.00	142.00	150.00
22 x 33	36.00	41.00	45.00	51.00	140.00	157.00	.....	.....
24 x 36	45.00	50.00	56.00	62.00	165.00	182.00	.....	.....

Furnished faced only, unless otherwise ordered.

For Malleable Iron Flanges (No. 271 E) use double the list prices of No. 151 E Cast Iron Flanges and the discount applying to Malleable Iron Flanges.

*Cast Steel Flanges when ordered faced and drilled, will always be furnished with bolt holes spot faced, at prices given above.

For drilling template, see page 93.

EXTRA HEAVY REDUCING COMPANION FLANGES

FOR 250 POUNDS WORKING STEAM PRESSURE

WITH RIBS
CAST IRON

These flanges, used in connection with straight or reducing fittings, enable us to fill orders more promptly. Customers who desire fittings reduced in this manner will please specify "reduce by flanges if necessary."

They will always be of the same thickness as the regular companion flanges of corresponding outside diameters, and drilled to the template corresponding to outside diameter, unless otherwise ordered.

In ordering reducing companion flanges always give the screwed or reduced size first, then the outside diameter of flange wanted; for instance, if a reducing flange is wanted to connect a 6-inch pipe to a 9-inch flanged valve or fitting having a 15-inch O. D. flange, order a 6x15-inch reducing flange. This will clearly avoid the confusion often caused by orders incorrectly calling for a 9x6 or a 6x9-inch flange.

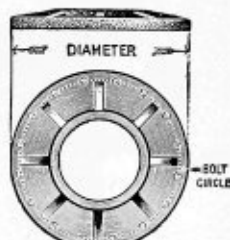


FIG. 281

Size, Inches	Price		Size, Inches	Price		Size, Inches	Price	
	Faced Each	Faced and Drilled, Each		Faced Each	Faced and Drilled, Each		Faced Each	Faced and Drilled, Each
1½ x 7½	\$ 2.30	\$ 2.65	4 x 12½	\$ 5.50	\$ 6.25	10x20½	\$17.50	\$17.25
2 x 7½	2.30	2.65	4½ x 12½	5.50	6.25	8x23	25.00	27.00
1½ x 8½	2.65	3.10	5 x 12½	5.50	6.25	9x23	25.00	27.00
2 x 8½	2.65	3.10	4½ x 14	7.25	8.15	10x23	25.00	27.00
2½ x 8½	2.65	3.10	5 x 14	7.25	8.15	12x23	25.00	27.00
2 x 9	3.30	3.85	6 x 14	7.25	8.15	8x24½	31.50	34.00
2½ x 9	3.30	3.85	3 x 15	8.40	9.45	10x24½	31.50	34.00
3 x 9	3.30	3.85	3½ x 15	8.40	9.45	12x24½	31.50	34.00
2 x 10	3.70	4.40	4 x 15	8.40	9.45	14x24½	31.50	34.00
2½ x 10	3.70	4.40	5 x 15	8.40	9.45	10x25½	37.00	39.75
3 x 10	3.70	4.40	6 x 15	8.40	9.45	12x25½	37.00	39.75
3½ x 10	3.70	4.40	7 x 15	8.40	9.45	14x25½	37.00	39.75
2 x 10½	4.00	4.70	4 x 16¼	10.50	11.70	15x25½	37.00	39.75
2½ x 10½	4.00	4.70	5 x 16¼	10.50	11.70	12x28	43.00	46.00
3 x 10½	4.00	4.70	6 x 16¼	10.50	11.70	14x28	43.00	46.00
3½ x 10½	4.00	4.70	7 x 16¼	10.50	11.70	15x28	43.00	46.00
4 x 10½	4.00	4.70	8 x 16¼	10.50	11.70	16x28	43.00	46.00
2 x 11	4.40	5.10	5 x 17½	12.00	13.50	14x30½	51.00	55.00
2½ x 11	4.40	5.10	6 x 17½	12.00	13.50	15x30½	51.00	55.00
3 x 11	4.40	5.10	7 x 17½	12.00	13.50	16x30½	51.00	55.00
3½ x 11	4.40	5.10	8 x 17½	12.00	13.50	18x30½	51.00	55.00
4 x 11	4.40	5.10	9 x 17½	12.00	13.50	16x33	60.00	65.00
4½ x 11	4.40	5.10	6 x 20½	17.50	19.25	18x33	60.00	65.00
2 x 12½	5.50	6.25	7 x 20½	17.50	19.25	20x33	60.00	65.00
2½ x 12½	5.50	6.25	8 x 20½	17.50	19.25	18x36	74.00	79.00
3 x 12½	5.50	6.25	9 x 20½	17.50	19.25	20x36	74.00	79.00

Furnished faced only, unless otherwise ordered.

BOLTS EXTRA.

**EXTRA HEAVY—REDUCING
CAST STEEL COMPANION FLANGES**

WITH RIBS



FIG. 282

Size Inches	Faced Each	* Faced, Drilled and Spot Faced Each	Size Inches	Faced Each	* Faced, Drilled and Spot Faced Each	Size Inches	Faced Each	* Faced, Drilled and Spot Faced Each
1½ x 7½	\$10.80	\$13.00	4 x 12½	\$30.90	\$35.50	10x20½	\$ 70.00	\$ 78.00
2 x 7½	10.80	13.00	4½ x 12½	30.90	35.50	8x23	85.00	95.00
1½ x 8¼	12.70	16.00	5 x 12½	30.90	35.50	9x23	85.00	95.00
2 x 8¼	12.70	16.00	4½ x 14	36.70	42.50	10x23	85.00	95.00
2½ x 8¼	12.70	16.00	5 x 14	36.70	42.50	12x23	85.00	95.00
2 x 9	18.10	21.50	6 x 14	36.70	42.50	8x24½	94.00	105.00
2½ x 9	18.10	21.50	3 x 15	40.00	46.00	10x24½	94.00	105.00
3 x 9	18.10	21.50	3½ x 15	40.00	46.00	12x24½	94.00	105.00
2 x 10	21.80	25.50	4 x 15	40.00	46.00	14x24½	94.00	105.00
2½ x 10	21.80	25.50	5 x 15	40.00	46.00	10x25½	115.00	127.00
3 x 10	21.80	25.50	6 x 15	40.00	46.00	12x25½	115.00	127.00
3½ x 10	21.80	25.50	7 x 15	40.00	46.00	14x25½	115.00	127.00
2 x 10½	23.80	27.50	4 x 16¼	44.00	50.00	15x25½	115.00	127.00
2½ x 10½	23.80	27.50	5 x 16¼	44.00	50.00	12x28	145.00	158.00
3 x 10½	23.80	27.50	6 x 16¼	44.00	50.00	14x28	145.00	158.00
3½ x 10½	23.80	27.50	7 x 16¼	44.00	50.00	15x28	145.00	158.00
4 x 10½	23.80	27.50	8 x 16¼	44.00	50.00	16x28	145.00	158.00
2 x 11	24.80	28.50	5 x 17½	52.00	59.00	14x30½	175.00	189.00
2½ x 11	24.80	28.50	6 x 17½	52.00	59.00	15x30½	175.00	189.00
3 x 11	24.80	28.50	7 x 17½	52.00	59.00	16x30½	175.00	189.00
3½ x 11	24.80	28.50	8 x 17½	52.00	59.00	18x30½	175.00	189.00
4 x 11	24.80	28.50	9 x 17½	52.00	59.00	16x33	210.00	227.00
4½ x 11	24.80	28.50	6 x 20½	70.00	78.00	18x33	210.00	227.00
2 x 12½	30.90	35.50	7 x 20½	70.00	78.00	20x33	210.00	227.00
2½ x 12½	30.90	35.50	8 x 20½	70.00	78.00	18x36	250.00	267.00
3 x 12½	30.90	35.50	9 x 20½	70.00	78.00	20x36	250.00	267.00

*Cast Steel Reducing Companion Flanges when ordered faced and drilled, will always be furnished with spot faced bolt holes at the prices given above.

For drilling template, see page 93.

EXTRA HEAVY BLIND FLANGES FOR 250 POUNDS STEAM WORKING PRESSURE

16 Inch O. D. and Smaller

17½ Inch O. D. and Larger



FIG. 283



FIG. 284

Size of Valve or Fitting and O. D. of Flange Inches	No. 153 E Cast Iron		No. 253 E Ferrosteeel	
	Faced Each	Faced and Drilled Each	Faced Each	Faced and Drilled Each
1½ x 6	\$1.65	\$2.00	\$2.05	\$2.50
2 x 6½	1.90	2.25	2.35	2.80
2½ x 7½	2.10	2.45	2.60	3.05
3 x 8¼	2.40	2.85	3.00	3.55
3½ x 9	3.00	3.55	3.75	4.45
4 x 10	3.35	4.05	4.20	5.10
4½ x 10½	3.60	4.30	4.50	5.40
5 x 11	4.00	4.70	5.00	5.90
6 x 12½	5.00	5.75	6.25	7.20
7 x 14	6.60	7.50	8.25	9.35
8 x 15	7.65	8.70	9.60	10.90
9 x 16¼	9.50	10.70	11.90	13.40
10 x 17½	11.00	12.50	13.75	15.50
12 x 20½	16.00	17.75	20.00	22.00
14 x 23	22.50	24.50	28.00	30.50
15 x 24½	28.50	31.00	35.50	38.50
16 x 25½	33.50	36.25	42.00	45.00
18 x 28	39.00	42.00	48.50	52.00
20 x 30½	46.00	50.00	57.50	62.50
22 x 33	54.00	59.00	68.00	74.00
24 x 36	67.00	72.00	84.00	90.00

Sizes 14 inch and larger are to be used with O. D. Pipe of the same sizes. Furnished faced only, unless otherwise ordered.

EXTRA HEAVY CAST STEEL BLIND FLANGES

16 Inch O. D. and Smaller

17½ Inch O. D. and Larger



FIG. 285



FIG. 286

Size of Valve or Fitting and O. D. of Flange Inches	Faced Each	* Faced, Drilled and Spot Faced Each	Size of Valve or Fitting and O. D. of Flange Inches	Faced Each	* Faced, Drilled and Spot Faced Each	Size of Valve or Fitting and O. D. of Flange Inches	Faced Each	* Faced, Drilled and Spot Faced Each
2 x 6½	\$ 8.40	\$10.00	6x12½	\$24.90	\$29.50	15x24½	\$94.00	\$105.00
2½ x 7½	8.80	11.00	7x14	30.70	36.50	16x25½	115.00	127.00
3 x 8¼	10.70	14.00	8x15	34.00	40.00	18x28	145.00	158.00
3½ x 9	14.60	18.00	9x16¼	37.00	43.00	20x30½	175.00	189.00
4 x 10	18.30	22.00	10x17½	52.00	59.00	22x33	210.00	227.00
4½ x 10½	19.80	23.50	12x20½	70.00	78.00	24x36	250.00	267.00
5 x 11	20.80	24.50	14x23	85.00	95.00			

*Cast Steel Blind Flanges when ordered faced and drilled, will always be furnished with spot faced bolt holes at prices given above.

For drilling template, see page 93.

TEMPLATES FOR DRILLING

EXTRA HEAVY AND MEDIUM FLANGED VALVES AND EXTRA HEAVY
FLANGED FITTINGS

AMERICAN STANDARD

Effective January 1, 1914

Size, Inches	Diameter of Flanges, Inches	Thickness of Flanges, Inches	Bolt Circle Inches	Number of Bolts	Size of Bolts, Inches	Length of Bolts, Inches	Length of Studs with 2 Nuts, Inches
1	4½	1½	3¼	4	½	2	.....
1¼	5	¾	3¾	4	½	2¼	.....
1½	6	1½	4½	4	¾	2½	.....
2	6½	¾	5	4	¾	2½	.....
2½	7½	1	5¾	4	¾	3	.....
3	8¼	1½	6¾	8	¾	3¼	.....
3½	9	1½	7¼	8	¾	3¼	.....
4	10	1¾	7¾	8	¾	3½	.....
4½	10½	1½	8½	8	¾	3½	.....
5	11	1¾	9¼	8	¾	3¾	.....
6	12½	1½	10¾	12	¾	3¾	.....
7	14	1½	11¾	12	¾	4	.....
8	15	1¾	13	12	¾	4¼	.....
9	16¼	1¾	14	12	1	4¾	.....
10	17½	1¾	15¼	16	1	5	.....
12	20½	2	17¾	16	1½	5¼	.....
14	23	2½	20¼	20	1½	5½	.....
15	24½	2½	21½	20	1½	5¾	.....
16	25½	2½	22½	20	1½	6	.....
18	28	2¾	24¾	24	1½	6¼	.....
20	30½	2½	27	24	1¾	6½	.....
22	33	2¾	29¼	24	1½	7	.....
24	36	2¾	32	24	1¾	7½	9½
26	38¼	2½	34½	28	1¾	7¾	10
28	40¾	2½	37	28	1¾	8	10
30	43	3	39¼	28	1¾	8¼	10½
32	45¼	3½	41½	28	1¾	8½	11
34	47½	3¼	43½	28	1¾	9	11½
36	50	3¾	46	32	1¾	9¼	11½
38	52¼	3¾	48	32	1¾	9¼	11½
40	54½	3¾	50¼	36	1¾	9½	12
42	57	3½	52¾	36	1¾	9¾	12
44	59¼	3¾	55	36	2	10	12½
46	61½	3¾	57¼	40	2	10¼	13
48	65	4	60¾	40	2	10½	13

These drilling Templates are in multiples of four, so that fittings may be made to face in any quarter, and bolt holes straddle the center line.

Bolt holes are drilled ⅛ inch larger than nominal diameter of bolts.

For Flanges with Male, Female Tongue or Groove Faces add ¼ inch to the bolt length given in table above.

For Cranelap Joints for each flange add the thickness of the pipe to the bolt length given in table above.

EXTRA HEAVY CAST STEEL FLANGED FITTINGS
FOR STEAM WORKING PRESSURES UP TO 350 POUNDS AND A
TOTAL TEMPERATURE OF 800 DEGREES

Elbows, No. 101 D

**FIG. 287**

45° Elbows, No. 103 D

**FIG. 289**

Size Inches	Center to Face Inches	Diameter of Flanges Inches	No. 101 D		Center to Face Inches	No. 103 D	
			Faced Each	Faced, Drilled and Spot Faced		Faced Each	Faced, Drilled and Spot Faced
1¼	4¼	5	\$ 9.00	11.00	2½	\$ 9.00	11.00
1½	4½	6	10.00	12.00	2¾	10.00	12.00
2	5	6½	11.00	13.00	3	11.00	13.00
2½	5½	7½	13.00	15.00	3½	13.00	15.00
3	6	8¼	14.00	17.00	3¾	14.00	17.00
3½	6½	9	17.00	20.00	4	17.00	20.00
4	7	10	19.00	22.00	4½	19.00	22.00
4½	7½	10½	22.00	25.00	4¾	22.00	25.00
5	8	11	24.00	27.00	5	24.00	27.00
6	8½	12½	29.00	33.00	5½	29.00	33.00
7	9	14	36.00	41.00	6	36.00	41.00
8	10	15	43.00	48.00	6½	43.00	48.00
9	10½	16¼	52.00	57.00	6¾	52.00	57.00
10	11½	17½	61.00	67.00	7	61.00	67.00
12	13	20½	77.00	84.00	8	77.00	84.00
14	15	23	100.00	108.00	8½	100.00	108.00
15	15½	24½	112.00	120.00	9	112.00	120.00
16	16½	25½	130.00	140.00	9½	130.00	140.00
18	18	28	170.00	180.00	10	170.00	180.00
20	19½	30½	210.00	225.00	10½	210.00	225.00
22	20½	33	270.00	290.00	11	270.00	290.00
24	22½	36	335.00	355.00	12	335.00	355.00

The flanges of these Fittings are regularly furnished with a raised face $\frac{1}{16}$ inch high inside the bolt holes.

Fittings can be furnished with Male Flanges for high pressure water lines, at an extra price.

For Drilling Template, see page 93.

EXTRA HEAVY CAST STEEL FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 350 POUNDS AND A
TOTAL TEMPERATURE OF 800 DEGREES

Tees, No. 105 D



FIG. 289

Reducing Tees, No. 107 D
Reducing in Run or Branch

FIG. 290

Size Inches	Face to Face Inches	Center to Face Inches	Diameter of Flanges Inches	No. 105 D		No. 107 D	
				Faced Each	Faced, Drilled and Spot Faced	Faced Each	Faced, Drilled and Spot Faced
1¼	8½	4¼	5	\$ 13.00	16.00	.....	.....
1½	9	4½	6	14.00	17.00	.....	.....
2	10	5	6½	15.00	18.00	15.00	18.00
2½	11	5½	7½	17.00	20.00	17.00	20.00
3	12	6	8¼	19.00	23.00	19.00	23.00
3½	13	6½	9	22.00	26.00	22.00	26.00
4	14	7	10	25.00	29.00	25.00	29.00
4½	15	7½	10½	30.00	34.00	30.00	34.00
5	16	8	11	33.00	37.00	33.00	37.00
6	17	8½	12½	40.00	46.00	40.00	46.00
7	18	9	14	49.00	56.00	49.00	56.00
8	20	10	15	58.00	65.00	58.00	65.00
9	21	10½	16¼	69.00	76.00	69.00	76.00
10	23	11½	17½	81.00	90.00	81.00	90.00
12	26	13	20½	100.00	110.00	100.00	110.00
14	30	15	23	135.00	147.00	135.00	147.00
15	31	15½	24½	150.00	162.00	150.00	162.00
16	33	16½	25½	175.00	190.00	175.00	190.00
18	36	18	28	230.00	245.00	230.00	245.00
20	39	19½	30½	300.00	320.00	300.00	320.00
22	41	20½	33	375.00	405.00	375.00	405.00
24	45	22½	36	460.00	490.00	460.00	490.00

The flanges on these Fittings are regularly furnished with a raised face $\frac{1}{16}$ inch high inside the bolt holes.

Fittings can be furnished with Male Flanges for high pressure water lines, at an extra price.

For Drilling Template, see page 93.

EXTRA HEAVY CAST STEEL FLANGED FITTINGS

FOR STEAM WORKING PRESSURES UP TO 350 POUNDS AND A
TOTAL TEMPERATURE OF 800 DEGREESFlanged Crosses
No. 113 D

FIG. 291

Reducing Flanged Crosses
No. 115 D

FIG. 292

Size Inches	Face to Face Inches	Center to Face Inches	Diameter of Flanges Inches	No. 113 D		No. 115 D	
				Faced Each	Faced, Drilled and Spot Faced	Faced Each	Faced, Drilled and Spot Faced
1 1/4	8 1/2	4 1/4	5	\$ 17.00	21.00	.....	.....
1 1/2	9	4 1/2	6	19.00	23.00	.....	.....
2	10	5	6 1/2	21.00	25.00	\$ 21.00	25.00
2 1/2	11	5 1/2	7 1/2	25.00	29.00	25.00	29.00
3	12	6	8 1/4	27.00	33.00	27.00	33.00
3 1/2	13	6 1/2	9	32.00	38.00	32.00	38.00
4	14	7	10	36.00	42.00	36.00	42.00
4 1/2	15	7 1/2	10 1/2	42.00	48.00	42.00	48.00
5	16	8	11	45.00	51.00	45.00	51.00
6	17	8 1/2	12 1/2	55.00	63.00	55.00	63.00
7	18	9	14	68.00	78.00	68.00	78.00
8	20	10	15	81.00	91.00	81.00	91.00
9	21	10 1/2	16 1/4	100.00	110.00	100.00	110.00
10	23	11 1/2	17 1/2	115.00	127.00	115.00	127.00
12	26	13	20 1/2	145.00	160.00	145.00	160.00
14	30	15	23	190.00	205.00	190.00	205.00
15	31	15 1/2	24 1/2	210.00	225.00	210.00	225.00
16	32	16 1/2	25 1/2	245.00	265.00	245.00	265.00
18	36	18	28	320.00	340.00	320.00	340.00
20	39	19 1/2	30 1/2	400.00	430.00	400.00	430.00
22	41	20 1/2	33	510.00	550.00	510.00	550.00
24	45	22 1/2	36	635.00	675.00	635.00	675.00

The flanges on these Fittings are regularly furnished with a raised face $\frac{1}{16}$ inch high inside the bolt holes.

Fittings can be furnished with Male Flanges for high pressure water lines, at an extra price.

For Drilling Template, see page 93.

**EXTRA HEAVY HYDRAULIC
CAST STEEL FLANGED FITTINGS
FOR COLD WATER OR OIL WORKING PRESSURES UP TO
3000 POUNDS HYDROSTATIC**

Tested to 3000 Pounds Hydraulic Pressure
No. 271 D Elbows No. 273 D 45° Elbows



FIG. 293



FIG. 294

FURNISHED MALE OR FEMALE AS ORDERED

Center to Face No. 271 D Inches	Center to Face No. 273 D Inches	Diameter of Flanges Either Style Inches	No. 271 D Elbows		No. 273 D 45° Elbows	
			Faced Each	Faced, Drilled and Spot Faced	Faced Each	Faced, Drilled and Spot Faced
7 1/4	3 1/4	6 1/2	\$ 29.00	32.50	29.00	32.50
8	3 1/2	7 1/2	31.50	35.00	31.50	35.00
8 3/4	4	8 3/4	35.00	40.00	35.00	40.00
9 1/2	4 1/2	10	42.50	47.50	42.50	47.50
10 3/4	5 1/4	11 1/2	51.50	57.50	51.50	57.50
13 3/4	6	13 1/2	68.50	77.50	68.50	77.50
15	6 1/2	15	80.00	90.00	80.00	90.00

No. 275 D Tees

No. 279 D Crosses



FIG. 295



FIG. 296

FURNISHED MALE OR FEMALE AS ORDERED

Size Ins.	Inside Diameter of Port Ins.	Center to Face Ins.	Diameter of Flanges Ins.	No. 275 D Tees		No. 277 D Reducing Tees		No. 279 D Crosses		No. 280 D Red'g Crosses	
				Faced Each	Faced, Drill'd and Spot Faced	Faced, Each	Faced, Drill'd and Spot Faced	Faced Each	Faced, Drill'd and Spot Faced	Faced Each	Faced, Drill'd and Spot Faced
1 1/2	1 1/4	5 1/2	6 1/2	\$35.00	40.00	35.00	40.00	53.00	60.00	53.00	60.00
2	1 1/2	6	7 1/2	37.50	42.50	37.50	42.50	57.00	64.00	57.00	64.00
2 1/2	2	6 1/2	8 3/4	41.00	48.00	41.00	48.00	62.00	72.00	62.00	72.00
3	2 1/2	7 1/2	10	48.00	55.00	48.00	55.00	72.00	82.00	72.00	82.00
4	3	8 1/2	11 1/2	58.50	67.50	58.50	67.50	88.00	100.00	88.00	100.00
5	4	10	13 1/2	78.00	90.00	78.00	90.00	117.00	135.00	117.00	135.00
6	5	11	15	96.00	110.00	96.00	110.00	145.00	165.00	145.00	165.00

See following page for other information.

EXTRA HEAVY HYDRAULIC CAST STEEL FLANGED FITTINGS—CONTINUED

These Fittings are suitable for the working pressure specified above when used in hydraulic installations in which shock is absent or so slight as to be negligible. WHEN SUBJECT TO SHOCK they are NOT recommended for these pressures. Fittings for Air or Gas are SPECIAL.

The inside diameter of these Fittings is approximately the same as that of Double Extra Strong Pipe.

The dimensions of Reducing Fittings, sizes up to and including 6 inch, do not change by any reduction in the size of run or outlet.

Reducing Tees having outlet larger than the run will be governed by the dimensions of the Tee corresponding to the largest opening, for example: A 4x4x6 inch Tee will have the dimensions of a 6 inch Tee, namely, 11 inches center to face of all openings.

The length, Center to Face and Face to Face of Male or Female, Extra Heavy Hydraulic Flanged Fittings is measured from Face of Flange and not from Tongue or Recess.

EXTRA HEAVY HYDRAULIC CAST STEEL COMPANION FLANGES

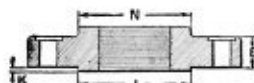


FIG. 297



FIG. 298

Size.....	inches	1½	2	2½	3	4	5	6
B—Diameter of Flange.....	inches	6½	7½	8½	10	11½	13½	15
E—Thickness of Flange.....	inches	1	1	1½	1½	1½	1½	1½
L—Diameter of Female.....	inches	2½	2½	3½	4	5½	6½	7½
M—Depth of Female.....	inches	1½	1½	1½	1½	1½	1½	1½
J—Diameter of Male.....	inches	2¼	2¼	3¼	3½	5	6½	7¼
K—Thickness of Male.....	inches	¾	¾	¾	¾	¾	¾	¾
N—Diameter of Hub.....	inches	2½	3½	4	4½	5½	6½	7½
Face.....	each	\$7.75	8.25	8.75	9.75	11.50	13.75	17.50
Faced, Drilled and Spot Faced.....	each	8.50	9.00	10.00	11.00	13.00	16.00	20.00

In ordering state whether Male or Female Face is wanted.

TEMPLATES FOR DRILLING EXTRA HEAVY HYDRAULIC CAST STEEL FLANGED VALVES AND FITTINGS

FOR COLD WATER OR OIL WORKING PRESSURES UP TO
3000 POUNDS HYDROSTATIC

Size Ins.	Diam- eter of Flanges Inches	Thick- ness of Flanges Inches	Diam- eter of Bolt Circle Inches	Number of Bolts	Size of Bolts Inches	Length of Bolts Inches	Diam- eter of Male Inches	Height of Male Inches	Diam- eter of Female Inches	Depth of Female Inches
1½	6½	¾	5	4	¾	2¾	2¼	¾	2½	1½
2	7½	1	5¾	4	¾	3¼	2¾	¾	2½	1½
2½	8½	1½	6½	8	¾	3½	3½	¾	3½	1½
3	10	1¼	8	8	¾	3¾	3½	¾	4	1½
4	11½	1¾	9¾	8	1¼	4¼	5	¾	5½	1½
5	13½	1½	11	12	1½	4½	6½	¾	6½	1½
6	15	1¾	12½	12	1¼	4¾	7¼	¾	7½	1½

These Drilling Templates are in multiples of four, so that fittings may be made to face in any quarter, and bolt holes straddle the center line.

Bolt holes are drilled ⅛ inch larger than nominal diameter of bolts and are regularly furnished spot faced.

STANDARD BRASS GLOBE, ANGLE AND CROSS VALVES

FOR STEAM WORKING PRESSURES. SIZES 3 INCH AND SMALLER,
UP TO 125 POUNDS. SIZES 3½ AND 4 INCH, UP TO 100 POUNDS

No. 1 Globe

Screwed and Flanged

No. 2 Angle



FIG. 299



FIG. 300

Size.....inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
No. 1 Globe, Ser'd.....each	80.72	.72	.77	1.00	1.26	1.80	2.52	3.50	5.30	10.00	14.40	26.50	36.00
No. 2 Angle, Ser'd.....each	.72	.72	.77	1.00	1.26	1.80	2.52	3.50	5.30	10.00	14.40	26.50	36.00
No. 18, Cross, Ser'd.....each	1.25	1.25	1.50	2.00	2.50	3.50	5.00	8.00	16.00	24.00	50.00		
No. 3, Globe or Angle, Flanged.....each				5.00	6.75	8.50	10.50	16.00	23.00	35.00	50.00	70.00	
Center to F, Angle, Flanged.....inches		$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	$3\frac{1}{2}$	$3\frac{3}{4}$	$4\frac{1}{4}$	$4\frac{3}{4}$	$5\frac{1}{2}$	$6\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{2}$	9
Face to F, Globe, Flanged.....inches		$3\frac{1}{4}$	$3\frac{1}{2}$	4	$4\frac{1}{2}$	$4\frac{3}{4}$	5	$5\frac{1}{2}$	6	7	$7\frac{1}{2}$	$8\frac{1}{2}$	9
Diameter of Flanges.....inches		$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	7	$7\frac{1}{2}$	$8\frac{1}{2}$	9		

Globe No. 4



FIG. 301

HARD METAL GLOBE AND ANGLE VALVES

EXTRA HEAVY WITH NON-HEATING WHEEL
FOR STEAM WORKING PRESSURES
UP TO 250 POUNDS

These Valves have withstood the hardest tests on extreme pressures and severe service and are particularly recommended where exceptionally strong and durable Valves are required.

They may be packed while under pressure; to do so, have Valve wide open.

Sizes ¾ inch and larger have a gland.

In ordering, be particular to specify whether Globe or Angle Valves are wanted.

Size ....inches	½	¾	1	1¼	1½	2	2½	3
Price .....each	\$1.90	2.50	3.50	5.00	7.00	11.00	20.00	29.00

WILLIAMS BRASS REGRINDING VALVES
MEDIUM AND EXTRA HEAVY PATTERNS,
SCREWED AND FLANGED ENDS



FIG. 302



FIG. 303



FIG. 304

MEDIUM PATTERN, SCREW ENDS, FOR 200 LBS. WORKING PRESSURE

Size	inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Angle and Globe Valves.....each		\$0.70	.70	.85	1.15	1.45	2.00	2.80	3.90	6.20	12.00	16.50
Cross Valves	each	1.00	1.00	1.00	1.50	2.00	2.70	3.50	5.10	8.00	16.00	24.00

MEDIUM PATTERN, FLANGED ENDS, FOR 200 LBS. WORKING PRESSURE

Size	inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Angle and Globe Valves.....each		\$2.20	3.40	4.70	5.80	8.00	11.00	14.50	21.00	29.00
Cross Valves.....each		3.20	5.10	7.00	8.40	12.00	15.00	20.50	29.00	40.00

EXTRA HEAVY, SCREW ENDS, FOR 350 LBS. WORKING PRESSURE

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Angle and Globe Valves...each		\$0.90	1.10	1.50	2.30	3.60	5.10	7.10	10.90	19.50	29.00
Cross Valves.....each		1.20	1.30	1.90	2.90	4.50	6.30	8.60	13.10	23.40	34.50

EXTRA HEAVY, FLANGED ENDS, FOR 350 LBS. WORKING PRESSURE

Size	inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Angle and Globe Valves.....each		\$2.50	4.10	5.80	7.60	11.00	14.00	20.00	32.00	44.00
Cross Valves	each	3.50	5.90	8.20	10.50	14.50	19.00	27.00	43.00	57.00

JENKINS BROS.' BRASS VALVES

Globe



FIG. 305

Angle



FIG. 306

Cross



FIG. 307

Size.....inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Globe and angle valve, screwed.....	\$1.10	\$1.10	\$1.25	\$1.60	\$2.20	\$2.80
Globe and angle valve, flanged.....		3.50	4.00	4.00	5.00	6.00
Cross valve, screwed.....		1.70	2.00	2.25	2.50	3.25
Cross valve, flanged.....						9.00

Size.....inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Globe and angle valve, screwed....	\$4.00	\$5.50	\$8.75	\$15.75	\$22.00
Globe and angle valve, flanged....	9.00	11.00	16.50	25.00	34.00
Cross valve, screwed.....	4.75	6.25	9.50	20.00	27.50
Cross valve, flanged.....	12.00	15.00	23.00	33.00	44.00

JENKINS BROS.' EXTRA HEAVY BRASS VALVES

GLOBE AND ANGLE PATTERNS

FOR PRESSURES 150 TO 300 POUNDS

Screwed



FIG. 308

Flanged



FIG. 309

GLOBE OR ANGLE PATTERNS

Size.....inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Screwed.....each	\$4.00	\$5.00	\$6.50	\$8.25	\$11.00	\$16.00	\$33.00	\$45.00
Flanged.....each	6.00	7.50	10.00	13.00	17.00	24.00	43.00	57.00

THE POWELL "WHITE STAR" VALVES

REGRINDABLE, REVERSIBLE, RENEWABLE

STEAM BRONZE COMPOSITION

SCREWED AND FLANGED

Globe



FIG. 310

Angle



FIG. 311

Cross



FIG. 312

REGULAR—FOR STEAM WORKING PRESSURE UP TO 200 POUNDS

Size .....inches	$\frac{1}{8}$ — $\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Globe, Screwed....each	\$1.10	1.25	1.60	2.20	2.80	4.00	5.50	8.75	15.75	22.00
Globe, Flanged....each	3.40	3.40	5.10	6.70	8.30	11.50	15.65	20.75	30.00	42.00
Angle, Screwed....each	1.10	1.25	1.60	2.20	2.80	4.00	5.50	8.75	15.75	22.00
Angle, Flanged....each	3.40	3.40	5.10	6.70	8.30	11.50	15.65	20.75	30.00	42.00
Cross, Screwed....each	1.75	1.75	2.55	3.10	4.15	5.45	7.80	12.00	23.50	35.50
Cross, Flanged....each	4.75	4.75	7.35	9.80	11.75	16.75	21.00	28.65	41.00	56.70

EXTRA HEAVY—FOR STEAM WORKING PRESSURE UP TO 300 POUNDS

Size .....inches	$\frac{1}{8}$ — $\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Globe, Screwed....each	\$1.65	1.90	2.55	3.50	5.35	7.80	10.50	15.90	28.25	42.00
Globe, Flanged....each	....	4.20	6.65	9.15	12.00	17.30	22.00	31.35	50.25	69.40
Angle, Screwed....each	1.65	1.90	2.25	3.50	5.35	7.80	10.50	15.90	28.25	42.00
Angle, Flanged....each	....	4.20	6.65	9.15	12.00	17.30	22.00	31.35	50.25	69.40
Cross, Screwed....each	2.00	2.20	3.10	4.30	6.50	9.20	12.50	18.70	33.50	49.00
Cross, Flanged....each	....	5.70	9.40	12.75	16.30	22.50	29.50	41.85	66.75	88.85

In sizes $\frac{1}{8}$ — $\frac{1}{4}$ — $\frac{3}{8}$ — $\frac{1}{2}$ " valves the discs are loose and swiveling but not reversible, in $\frac{3}{4}$ " and larger sizes the discs are reversible.

LUNKENHEIMER REGRINDING BRONZE VALVES

MEDIUM PATTERN, SCREW ENDS, FOR 200 POUNDS WORKING PRESSURE; WITH "B-H" FLANGE ENDS FOR 150 POUNDS

EXTRA HEAVY PATTERN, SCREW ENDS, FOR 300 POUNDS WORKING PRESSURE; WITH "B-X" FLANGE ENDS FOR 250 POUNDS

Globe



FIG. 313

Angle



FIG. 314

Cross



FIG. 315

The large sale of Lunkenheim Re grinding Valves has demonstrated that steam users appreciate the fact that it is possible to secure in them a reliable valve, which can be repaired without disconnecting pipes or incurring any expense other than the slight labor involved in regrinding the seating surfaces. When a steam user installs Lunkenheim Valves the expense ends with the purchase of the articles. This is not true with valves in which to secure a new seat bearing it is necessary to purchase extra parts; therefore, as a matter of economy, the first cost of Lunkenheim Valves should not be the principal consideration.

The expense of disconnecting pipes and taking out defective valves is many times more than the cost of a good article, which, if installed in the first place, would render such expense unnecessary. Therefore, when installing pipe systems, it will be found better to purchase Lunkenheim Valves rather than the common grades.

MEDIUM PATTERN—SCREWED

Size	inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price, Globe or Angle..ea.	\$0.70	.85	1.15	1.45	2.00	2.80	3.90	6.20	12.00	16.50	30.00	40.00		
Price, Cross	each	1.00	1.00	1.50	2.00	2.70	3.50	5.10	8.00	16.00	24.00	38.00	50.00	

MEDIUM PATTERN—FLANGED

Size	inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price, Globe or Angle..ea.	\$2.80	3.40	4.70	5.80	8.00	11.00	14.50	24.00	29.00	45.00	63.00	
Price, Cross	each	3.80	5.40	7.00	8.40	12.00	15.00	20.50	32.00	40.00	58.00	80.00

EXTRA HEAVY PATTERN—SCREWED

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price, Globe or Ang..ea.	\$0.90	1.10	1.50	2.30	3.60	5.10	7.10	10.90	19.50	29.00	42.30	53.90	
Price, Cross	each	1.20	1.30	1.90	2.90	4.50	6.30	8.60	13.10	23.40	34.50	50.40	63.60

EXTRA HEAVY PATTERN—FLANGED

Size	inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Globe or Angle..each	\$6.20	7.80	9.70	13.50	15.50	21.50	29.50	47.00	62.00	90.00	125.00	
Cross	each	9.70	11.50	14.50	18.00	23.50	32.00	40.00	58.00	77.00	110.00	160.00
Diam. of Flanges.in.		3	$3\frac{1}{2}$	4	$4\frac{1}{4}$	5	6	$6\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{2}$	9	10

FAIRBANKS VULCABESTON BRONZE VALVES

Globe



FIG. 316

**GLOBE, ANGLE AND CROSS
RENEWABLE VULCABESTON RING
DISC, FOLLOWER GLAND**

300 Pounds Hydraulic Test Pressure.
150 Pounds Steam Working Pressure.
175 Pounds Water Working Pressure.
Screw and Flange Ends.

They have a raised round seat upon which scale, grit or other sediment is not liable to lodge.

The seat is preserved from injury by the use of a comparatively soft ring in the renewable disc.

Sizes $\frac{3}{8}$ inch and under are not made with follower gland.

Angle



FIG. 317

Size	Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Globe, Screw End	each	\$1.10	1.10	1.25	1.60	2.20	2.80	4.00	5.50	8.75	15.75	22.00
Angle, Screw End	"				4.00	5.00	6.00	9.00	11.00	16.50	25.00	34.00
Globe, Flange End	"											
Angle, Flange End	"											
Cross, Screw End	"				2.25	2.50	3.25	4.75	6.25	9.50	20.00	30.00

DISCS FOR FAIRBANKS BRONZE VALVES.

No. 019
Sectional

FIG. 318

No. 019



No. 020



FIG. 319

No. 021



FIG. 320

No. 022



FIG. 321

Size	Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
No. 019, Vulcabeston Ring		.08	.08	.08	.10	.13	.17	.24	.32	.48	.80	1.10
Size	Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
No. 020, Solid Bronze		.20	.22	.10	.12	.15	.18	.27	.37	.54	.72	.90
Size	Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3			
No. 021, Bronze Holder, Special Metal		.12	.16	.20	.30	.40	.60	1.10	1.65			
Size	Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3			
No. 022, Bronze Holder, Nut, Washer and Ring		.15	.20	.25	.35	.50	.90	1.60	2.00			

FAIRBANKS BRASS SWING CHECK VALVES

300 Pounds Hydraulic Test Pressure.
150 Pounds Steam Working Pressure.
175 Pounds Water Working Pressure.



FIG. 322

Size	Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Straightway, Screw End	each	\$1.80	1.80	2.00	2.25	2.80
Angle, Screw End	"			2.00	2.25	2.80
Size	Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Straightway, Screw End	each	\$3.65	4.75	6.75	15.00	24.00
Angle, Screw End	"			3.65	4.75	6.75

Regular



FIG. 323

JENKINS' VALVE DISCS

REGULAR FOR VALVE PRESSURES UP
TO 150 POUNDS

STEAM METAL FOR VALVES, EXTRA
HEAVY PRESSURES

Steam Metal



FIG. 324

Size	Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Regular	Each	\$0.03	.04	.04	.05	.06	.09	.12	.18	.24	.40
Steam metal.....	Each	.14	.14	.16	.20	.22	.28	.30	.34	.60	.85
Size	Inches	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
Regular	Each	\$0.50	.60	.70	.80	1.00	1.20	1.40	1.80	2.25	2.50
Steam metal.....	Each	1.35	1.60	2.00	2.30	2.60	3.70	4.00	5.25	5.60	7.30
Size	Inches					14	16	18	20	22	24
Regular	Each					\$3.50	4.00	5.00	6.00	7.50	9.00
Steam metal.....	Each					9.80					

DURABLE VALVE DISCS



FIG. 325

Durable Discs will not chip nor crack. They are not affected by any fluid.

When applying Durable Discs remember that discs should come $\frac{1}{16}$ " higher than cup.

Size	Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price	Each	\$0.09	.10	.12	.15	.18	.26	.35	.54	.80
Size	Inches	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	10
Price	Each	\$1.20	1.50	1.80	2.10	2.40	3.00	3.50	4.25	5.50

"TUF" METAL VALVE DISCS



FIG. 326

The composition of this disc is of such a nature that the name we have given it seems particularly appropriate. The metal is soft enough to warrant a perfect seat, and of sufficient strength to prevent cutting or breaking, and is the result of a long series of experimenting with the compounding of different metals.

Size	Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price	Each	\$0.10	.15	.20	.25	.30	.40	.50	.75	1.25	1.75
Size	Inches	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	$6\frac{1}{2}$	7	$7\frac{1}{2}$	8
Price	Each	\$2.25	2.75	3.50	4.25	5.00	6.00	7.00	8.00	9.00	10.00
Size	Inches			$8\frac{1}{2}$	9	$9\frac{1}{2}$	10	$10\frac{1}{2}$	11	$11\frac{1}{2}$	12
Price	Each			11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00

EXTRA HEAVY HYDRAULIC GLOBE, ANGLE AND CHECK VALVES

HARD METAL

For Water Working Pressures

Sizes 1 inch and smaller, up to 2,000 pounds. Size 1¼ inch, up to 1,500 pounds.

No. 232H—With Gland

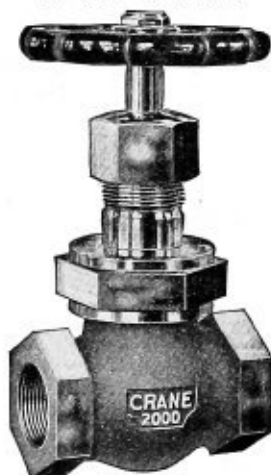


FIG. 327

No. 234H—Horizontal



FIG. 328

NO. 232 H. GLOBE OR ANGLE VALVES

Size	Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1¼
Price, Globe or Angle.....	Each	\$6.00	\$6.00	\$7.00	\$9.00	\$13.00

In ordering, state whether Globe or Angle Valves are wanted.

NO. 234 H. HORIZONTAL CHECK VALVES

Size	Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1¼
Price	Each	\$5.00	\$5.00	\$6.00	\$8.00	\$11.00

The body and disc of Globe and Angle Valves, and feather of Check Valves are made of "hard metal." All other parts (except wheel) are made of "special Brass."

The Globe and Angle Valves may be packed when wide open and under pressure.

These Valves can be furnished flanged when so ordered at a special price.

Horizontal



FIG. 329

STANDARD BRASS CHECK VALVES

FOR STEAM WORKING PRESSURES

SIZES 3 INCH AND SMALLER, UP TO 125 POUNDS. SIZES 3½ AND 4 INCH, UP TO 100 POUNDS

SCREWED AND FLANGED

Size	inches	1/8"	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"
No. 20, Screwed.....	each	\$0.65	.65	.70	.90	1.15	1.60	2.25
No. 21, Flanged.....	each					4.90	6.50	8.25
Diameter of Flanges.....	inches					3 1/2	4	4 1/2
Size	inches	1 1/2	2	2 1/2	3	3 1/2	4	
No. 20, Screwed.....	each	\$3.15	4.75	9.00	13.00	24.00	32.50	
No. 21, Flanged.....	each	10.15	15.50	22.00	33.50	47.50	66.50	
Diameter of Flanges.....	inches	5	6	7	7 1/2	8 1/2	9	

*These sizes are ball pattern.

Vertical.



FIG. 330

Angle



FIG. 331

Size	inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Price, No. 24, Vertical	each	\$0.72	.77	1.00	1.26	1.80	2.52	3.50	5.30		
Price, No. 26, Angle	each	.72	.77	1.00	1.26	1.80	2.52	3.50	5.30	10.00	14.40

Horizontal with Drip Cock



FIG. 332

Size	inches	1/2	3/4	1	1 1/4
No. 28, with Drip Cock.....	each	\$2.15	2.55	3.15	4.05
No. 30, without Drip Cock.....	each	1.85	2.20	2.70	3.60

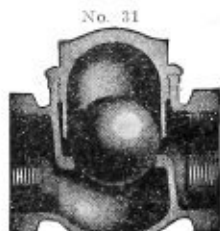


FIG. 333

STANDARD BRASS BALL CHECK VALVES

FOR STEAM WORKING PRESSURES
UP TO 125 POUNDS

Furnished with Drip Cock at an Extra Price

Size	inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
No. 31, Screwed, ea.		\$0.65	.65	.70	1.60	2.30	3.10	4.00	6.20	9.40

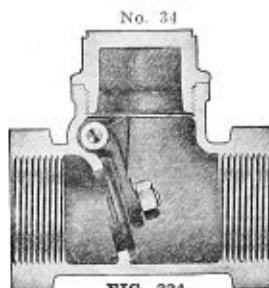


FIG. 334

STANDARD BRASS SWING CHECK VALVES

FOR STEAM WORKING PRESSURES
UP TO 125 POUNDS

May be used in a horizontal position or for upward flow.

Size	inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
No. 34, Brass Disc.....	each	\$1.80	2.00	2.25	2.80	3.65
Size	inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	
No. 34, Brass Disc.....	each	\$4.75	6.75	15.00	24.00	



FIG. 335

EXTRA HEAVY BRASS SWING CHECK VALVES

FOR STEAM WORKING PRESSURES
UP TO 250 POUNDS

Tested to 800 Pounds Hydraulic Pressure

SCREWED AND FLANGED

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
No. 74E, Screwed, ea.		\$3.25	3.25	4.25	6.00	7.50	12.00	25.00
No. 75E, Flanged, ea.		13.00	18.00	22.00	37.50	55.00		
Diam. of Flanges, in.		4 $\frac{1}{2}$	5	6	6 $\frac{1}{2}$	7 $\frac{1}{2}$		

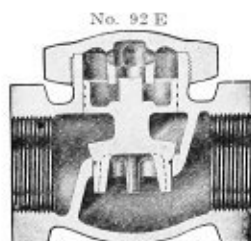


FIG. 336

EXTRA HEAVY BRASS REGRINDING UNION BONNET HORIZONTAL CHECK VALVES

FOR STEAM WORKING PRESSURES
UP TO 250 POUNDS

SCREWED AND FLANGED

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
No. 92E, Screwed	each	\$1.15	1.35	1.70	2.25	3.15	4.50	6.30	9.90	18.00	26.00
No. 93E, Flanged	each			5.00	7.00	10.00	13.00	18.00	30.00	43.00	
Diameter of Flanges, inches		4	4 $\frac{1}{2}$	5	6	6 $\frac{1}{2}$	7 $\frac{1}{2}$	8 $\frac{1}{4}$			
Face to Face, Flanged, inches		3 $\frac{1}{4}$	3 $\frac{3}{4}$	4 $\frac{1}{8}$	4 $\frac{1}{2}$	5 $\frac{1}{2}$	6 $\frac{1}{2}$	7 $\frac{5}{8}$	8 $\frac{3}{4}$		

WILLIAMS BRASS REGRINDING CHECK VALVES

SCREWED AND FLANGED ENDS
MEDIUM AND HEAVY PATTERNS

Horizontal



FIG. 337

Angle



FIG. 338

Vertical



FIG. 339

MEDIUM PATTERN SCREW ENDS, FOR 200 POUNDS WORKING
PRESSURE

Size	inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Horizontal, Angle or Vertical.												
Rough	each	\$0.50	.50	.60	.85	1.15	1.55	2.30	3.25	5.20	10.00	14.00
Horizontal, Angle or Vertical.												
Finished	each	.75	.75	.90	1.30	1.75	2.40	3.50	5.00	7.80	12.50	17.50

MEDIUM PATTERN FLANGE ENDS, FOR 200 POUNDS WORKING
PRESSURE

Size	inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Horizontal, Angle or Vertical.	each	\$1.90	3.00	4.30	5.20	7.30	9.70	13.30	18.20	25.80

EXTRA HEAVY PATTERN SCREW ENDS, FOR 350 POUNDS WORKING
PRESSURE

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Horizontal, Angle or Vertical.	each	\$0.70	.70	1.00	1.70	2.80	3.90	5.50	8.90	16.20	24.30

EXTRA HEAVY PATTERN FLANGE ENDS, FOR 350 POUNDS WORKING
PRESSURE

Size	inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Horizontal, Angle or Vertical.	each	\$2.20	3.70	5.20	6.80	9.40	12.70	18.10	29.00	39.10

Swing



FIG. 340

WILLIAMS BRASS REGRINDING
SWING CHECK VALVESMEDIUM FOR PRESSURES UP TO 200 POUNDS
EXTRA HEAVY FOR PRESSURES UP TO
350 POUNDS
SCREW ENDS

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Medium Pattern.....	each	\$1.25	1.25	1.30	1.75	2.25	3.25	4.25	6.25	11.50	16.00
Extra Heavy Pattern.....	each	2.00	2.10	2.20	2.90	4.00	5.60	7.50	11.00	18.30	28.30

JENKINS BROS.' BRASS CHECK VALVES

Horizontal Screwed



FIG. 341

Horizontal Flanged



FIG. 342

Vertical Screwed



FIG. 343

Size.....inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Brass horizontal, angle and vertical, screwed.....	\$1.10	1.20	1.30	1.90	2.60	3.60	5.00	7.50	13.50	21.00
Brass horizontal, angle and vertical, flanged.....	.....	.....	4.00	5.00	6.00	8.00	10.00	15.00	23.00	32.00

JENKINS' EXTRA HEAVY BRASS CHECK VALVES

Angle Screwed



FIG. 344

Horizontal Flanged



FIG. 345

PRICES HORIZONTAL OR ANGLE PATTERNS

Size .....inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Screwed .....each	\$3.00	\$3.50	\$4.50	\$6.00	\$7.75	\$11.50	\$21.00	\$30.00
Flanged.....each	5.00	6.50	8.50	10.50	14.25	20.00	31.00	42.00

JENKINS ST'D BRASS SWING CHECK VALVES



FIG. 346

Size.....inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Brass, screwed.....	\$1.20	\$1.30	\$1.90	\$2.60	\$3.60	\$5.00	\$7.50	\$14.00	\$21.00
Brass, flanged.....	.....	.....	.....	6.00	8.00	10.00	15.00	23.00	32.00

LUNKENHEIMER REGRINDING BRONZE CHECK VALVES

Horizontal Check Valve



FIG. 347

MEDIUM PATTERN WITH
SCREW ENDS FOR WORKING
PRESSURES UP TO 200 POUNDS

SCREW ENDS

Regrinding Swing Check Valve

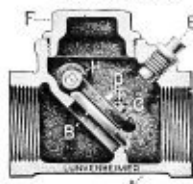


FIG. 348

LIST PRICES

Size	inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Horizontal	each	\$0.50	.50	.60	.85	1.15	1.55	2.30	3.25	5.20	10.00	14.00
Price, Swing	each	1.25	1.25	1.30	1.75	2.25	3.25	4.25	6.25	11.50	16.00	

POWELL WHITE STAR BRONZE CHECK VALVES

SCREW ENDS

Horizontal



FIG. 349

REGULAR—FOR STEAM WORKING PRESSURE UP TO 200 POUNDS

Size	inches	$\frac{1}{8}$ - $\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Horizontal	each	\$1.10	1.20	1.30	1.90	2.60	3.60	5.00	7.50	13.50	21.00

THE POWELL SWING CHECK VALVES

REGRINDABLE, RENEWABLE DISC
STEAM BRONZE COMPOSITION
SCREW ENDS

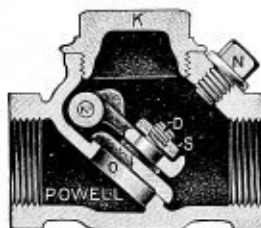


FIG. 350

REGULAR—FOR STEAM WORKING PRESSURE UP TO 150 POUNDS

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Horizontal	each	\$1.25	1.25	1.30	1.75	2.25	3.25	4.25	6.25	11.50	16.00



FIG. 351

STANDARD BRASS GATE VALVES

BRASS WITH GLAND WEDGE GATE

OPEN TO THE LEFT

NON-RISING STEM

FOR STEAM WORKING PRESSURES UP TO
125 POUNDS

These Valves have been designed for general service and are recommended with fullest confidence for use wherever Wedge Gate Valves are required.

The weight of each size as given in the table below is as light as this type of valve should be made, and is an important feature which should always be considered when making comparisons with similar, but much lighter valves of other manufacture.

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, No. 438.....	each	\$1.45	1.45	1.65	2.05	2.80	3.70	5.00	7.30	13.00	19.00
Weight	pounds	.75	.75	1.05	1.65	2.40	3.70	5.00	7.33	12.50	18.25



FIG. 352

STANDARD BRASS GATE VALVES

BRASS

DOUBLE GATE

OPEN TO THE LEFT

RISING STEM

BRASS SEATS

FOR STEAM WORKING PRESSURES

SIZES 3 INCH AND SMALLER, UP TO 125 POUNDS
SIZES $3\frac{1}{2}$ INCH AND LARGER, UP TO 100 POUNDS

Note.—The $3\frac{1}{2}$ to 6-inch Valves have flanged bonnet, non-rising stems, and are made to order.

These Valves are constructed with Parallel Seats and the bearing of the Wedge being central, it acts uniformly on all parts of the discs; consequently, it will force the discs to their seats and have an equal bearing on all parts.

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
No. 440, Screwed.....	each	\$1.45	1.45	1.65	2.05	2.80	3.70	5.00
Size	inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
No. 440, Screwed.....	each	\$7.30	13.00	19.00	43.00	58.00	110.00	165.00
No. 441 Flanged.....	each	25.00	33.00	39.00	68.00	83.00	135.00	190.00
Diameter of Flanges.....	inches	6	7	$7\frac{1}{2}$	$8\frac{1}{2}$	9	10	11
Face to Face, Flanges.....	inches	$5\frac{1}{2}$	6	$6\frac{1}{2}$	$6\frac{3}{4}$	7	$9\frac{1}{4}$	$10\frac{3}{4}$

EXTRA HEAVY BRASS GATE VALVES

CRANE SPECIAL BRASS WITH GLAND WEDGE GATE

OPEN TO THE LEFT NON-RISING STEM
FOR STEAM WORKING PRESSURES UP TO
250 POUNDS

TESTED TO 800 POUNDS HYDRAULIC PRESSURE
FOR WATER WORKING PRESSURES UP TO
350 POUNDS

These Valves are made extra heavy in all parts and are especially designed for extreme high pressure steam work.

These Valves may be packed when wide open and under pressure.



FIG. 353

Size	inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3
No. 66 E, Screwed	each	\$4.00	5.00	6.00	8.00	11.25	16.50	23.00	40.00	65.00
No. 67 E, Flanged	each				16.00	21.50	30.00	41.00	65.00	100.00
Diam., Flanges	inches				4 $\frac{1}{2}$	5	6	6 $\frac{1}{2}$	7 $\frac{1}{2}$	8 $\frac{1}{4}$
Face to Face Flanged	inches				4 $\frac{3}{8}$	4 $\frac{9}{16}$	5 $\frac{3}{8}$	6 $\frac{1}{16}$	7 $\frac{1}{8}$	8 $\frac{3}{16}$

No. 442

STANDARD QUICK OPENING BRASS GATE VALVES

FOR STEAM WORKING PRESSURES
UP TO 125 POUNDS



FIG. 354

Size	inches	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3
No. 442, Screwed	each	\$3.60	4.80	6.20	8.50	11.80	20.25	30.00

WILLIAMS BRASS DOUBLE DISC GATE VALVES

UNION BONNET AND INSIDE SCREW STEM



FIG. 355

MEDIUM PATTERN, FOR 200 LBS. WORKING PRESSURE

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Screw Ends	each	\$1.10	1.10	1.30	1.90	2.50	3.50	5.00	7.50	14.00	20.00
Flange Ends	each	...	2.60	3.00	4.00	5.30	7.70	10.50	14.00	21.00	32.00
Screw and Flange Ends	each	...	2.00	2.40	3.10	4.20	5.90	8.20	11.20	18.00	27.00
Finished with wood wheels, Screw ends	each	2.30	2.30	2.60	3.30	4.50	6.00	7.50	12.00	...	...
Finished all over, Finished Brass Wheel, Screw Ends	each	3.00	3.00	3.20	4.00	5.30	6.80	8.40	13.00	...	...

EXTRA HEAVY, FOR 350 LBS. WORKING PRESSURE

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Screw Ends	each	\$1.90	1.90	2.20	3.10	4.40	6.00	8.90	12.80	21.00	34.00
Screw and Flange Ends	each	...	2.80	3.30	4.50	6.20	8.60	12.10	16.50	25.20	40.00
Flange Ends	each	...	3.50	4.20	5.50	7.50	10.50	14.50	19.40	29.00	44.00

JENKINS BRASS GATE VALVES

SCREWED AND FLANGED

Standard Screwed



FIG. 356

Medium Screwed



FIG. 357

Extra Heavy Screwed



FIG. 358

STANDARD BRASS GATE VALVES

Suitable for 125 pounds working steam pressure; 175 pounds water pressure.

Size, inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
No. 370. Screwed, each	\$1.45	1.45	1.65	2.05	2.80	3.70	5.00	7.30	13.00	19.00
No. 371. Flanged, each				9.00	10.25	12.00	15.00	25.00	33.00	39.00

MEDIUM PRESSURE BRASS GATE VALVES

Suitable for 175 pounds working steam pressure.

Size, inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
No. 270. Screwed, each	\$2.35	2.35	2.75	3.25	4.50	6.00	8.00	13.00	20.00	32.50
No. 271. Flanged, each				10.25	12.50	16.25	21.50	31.00	45.00	67.50

EXTRA HEAVY BRASS GATE VALVES

Suitable for 250 pounds working steam pressure.

Size, inches	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
No. 280. Screwed, each	\$4.00	5.00	6.00	8.00	11.25	16.50	23.00	40.00	65.00
No. 281. Flanged, each			13.00	16.00	21.50	30.00	41.00	65.00	100.00

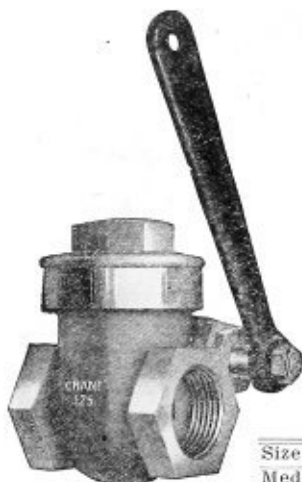


FIG. 359



FIG. 360

Medium Pattern

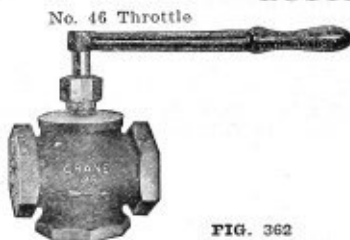


FIG. 362

Size	inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
No. 46. Throttle	each	\$10.00	11.50	14.00	20.00
No. 44. Butterfly	each	3.10	4.40	5.65	6.75

Size	inches	2	$2\frac{1}{2}$	3	.....
No. 46. Throttle	each	\$25.00	35.00	.....	.....
No. 44. Butterfly	each	10.00	13.75	21.00	.....

STANDARD QUICK-OPENING BRASS GATE VALVES

FOR STEAM WORKING PRESSURES
UP TO 125 POUNDS
WITH TAPER SEATS

Size	inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
No. 442 $\frac{1}{2}$. Screwed	each	\$3.60	4.80	6.20	8.50
Size	inches	2	$2\frac{1}{2}$	3	.....
No. 442 $\frac{1}{2}$. Screwed	each	\$11.80	20.25	37.00	.....

These Valves are so constructed that the discs can not bind or stick when installed in any position. These Valves are made screwed only.

WILLIAMS QUICK-OPENING BRASS GATE VALVES

MEDIUM FOR PRESSURES UP TO 100 LBS.
HEAVY FOR PRESSURES UP TO 200 LBS.

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	.....
Med. Pat.	each	\$1.60	1.80	2.50	.....
Hvy. Pat.	each	.....	3.00	4.00	.....
Size	inches	$1\frac{1}{4}$	$1\frac{1}{2}$	.....	.....
Med. Pat.	each	\$3.50	5.00	.....	.....
Hvy. Pat.	each	5.00	7.00	.....	.....

Size	inches	2	$2\frac{1}{2}$	3	.....
Med. Pat. ea. \$		7.50	13.50	19.00	.....
Hvy. Pat. ea.		10.00	19.00	29.00	.....
Size	inches	$3\frac{1}{2}$	4	.....	.....
Med. Pat.	each	\$40.00	60.00	.....	.....



FIG. 361

Heavy Pattern

STANDARD BRASS THROTTLE AND BUTTERFLY VALVES

No. 46 Throttle

No. 44 Butterfly

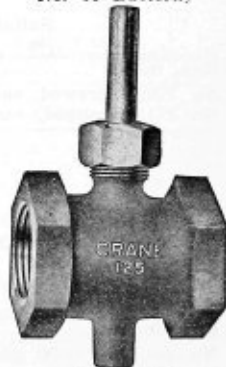


FIG. 363

STANDARD BRASS HOSE VALVES

Chicago Pattern



FIG. 364

Angle



FIG. 365

Straight



FIG. 366

CHICAGO PATTERN, IRON HANDLE

Size	inches	1	1 1/4	1 1/2	2	2 1/2
Price, rough body	each	\$3.15	3.70	4.75	7.00	8.50
Price, rough body, nickel-plated	each	3.65	4.30	5.50	8.00	9.75

GARDEN HOSE—EITHER STRAIGHT OR ANGLE OPENING

Size	inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2
Price	each	\$1.65	1.65	2.20	3.40	4.75	7.00	15.00

Straightway Pattern



FIG. 367

STRAIGHTWAY PATTERN

BRASS DOUBLE GATE TAPER SEATS

OPEN TO THE LEFT

RISING STEM

FOR WATER WORKING PRESSURES UP TO
175 POUNDSFOR STEAM WORKING PRESSURES UP TO
125 POUNDS

Size	inches	1	1 1/4	1 1/2	2	2 1/2	3
Price, Rough Body, Plain, with Brass Cap and Chain	each	\$5.10	6.70	8.85	12.60	20.00	29.50
Price, Rough Body, Plain, without Cap and Chain	each	3.35	4.70	6.25	9.00	15.00	22.00

No. 60, Angle, With Union

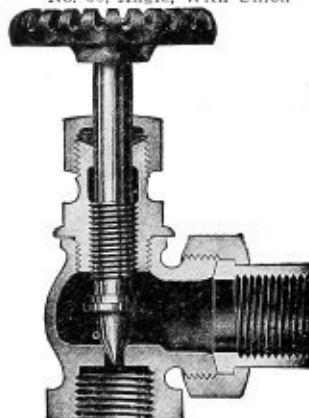


FIG. 368

NEEDLE POINT GLOBE AND ANGLE VALVES

BRASS

WITH NON-HEATING WHEEL FOR
WORKING PRESSURES UP TO 125 LBS

These Valves are used for regulating fuel oil feed, and are made to order only.

In ordering, state size of opening for feed; otherwise will furnish as below. Also state whether Globe or Angle, and with Female Openings or with Union.

Size	inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
Size Feed Opening	inches	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$
Price, Globe, Female Openings	each	\$1.20	1.40	1.50	2.00	2.50
Price, Angle, Female Openings	each	1.20	1.40	1.50	2.00	2.50
Price, Angle, with Union	each	2.00	2.00	2.20	3.00	3.50

No. 48



FIG. 369

LOCK AND SHIELD GLOBE AND ANGLE VALVES

BRASS FOR NATURAL GAS

PACKED READY FOR USE

Size	inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$
Price, Rough Body, Plain	each	\$1.10	1.35	1.60	2.25	3.25
Price, Rough Body, Plated all over	each	1.40	1.65	1.95	2.65	3.70

FIG. 370

No. 198

No. 199



FIG. 370

No. 200



FIG. 371

	Plated
*Price, No. 198	each \$0.70
*Price, No. 199	each 1.00
*Price, No. 200	each .25

*See table below showing various Lock and Shield Valves these keys will fit.

Size Valve	inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2
For No. 48 Valve	Key No.	200	200	198	198	198-199	198-199	199

WILLIAMS BRASS NEEDLE VALVES

WITH FEMALE ENDS

MEDIUM PATTERN

Globe Valve

Rough Body Iron Wheel
No. 606, Brass Stem
No. 482, Steel Stem



FIG. 372

Cross Valve

Rough Body Iron Wheel
No. 608, Brass Stem
No. 484, Steel Stem



FIG. 373

Angle Valve

Rough Body Iron Wheel
No. 607, Brass Stem
No. 491, Steel Stem



FIG. 374

Williams Needle Valves are intended for controlling gas, gasoline, oil, air or any liquid or gaseous vapor, the use of which requires a close regulation of the volume through the valve. Valves with brass stems are furnished with two styles of seat openings. The large seat opening A is regularly furnished on all orders for brass stem valves, while the small seat opening C is furnished only when specified on order. Valves with steel stems will always be furnished with the size seat openings listed under Style B.

NOTE—In ordering, be sure to give figure number and specify whether brass or steel stem valves are wanted, otherwise brass stem valves will be furnished.

Style of Seat Opening	Size of Valve.....inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
A	Diameter of Seat Opening, regularly furnished in all valves with brass stem..in.	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$
B	Diameter of Seat Opening, regularly furnished in all valves with steel stem..in.	$\frac{3}{32}$	$\frac{1}{16}$	$\frac{3}{32}$	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$
C	Diameter of Seat Opening, furnished on order only, in valves with brass stem.in.	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{3}{8}$
No. 606, Globe, Rough, with brass stem and iron wheel	each	\$0.65	.75	.85	1.60	2.00	2.80
No. 607, Angle, Rough, with brass stem and iron wheel	each	.65	.75	.85	1.60	2.00	2.80
No. 608, Cross, Rough, with brass stem and iron wheel	each	.95	1.25	1.50	2.40	3.00	4.00
No. 481, Globe, finished all over, brass stem with brass wheel	each	1.00	1.10	1.25	2.25	2.90	3.80
No. 492, Angle, finished all over, brass stem with brass wheel	each	1.00	1.10	1.25	2.25	2.90	3.80
No. 503, Cross, finished all over, brass stem with brass wheel	each	1.40	1.90	2.25	3.40	4.20	5.20
No. 482, Globe, Rough, with steel stem and iron wheel	each	.60	.70	.80	1.45	1.85	2.60
No. 491, Angle, Rough, with steel stem and iron wheel	each	.60	.70	.80	1.45	1.85	2.60
No. 484, Cross, Rough, with steel stem and iron wheel	each	.90	1.20	1.45	2.25	2.80	3.80
No. 483, Globe, finished all over, steel stem with brass wheel	each	.95	1.05	1.20	2.00	2.65	3.60
No. 504, Angle, finished all over, steel stem with brass wheel	each	.95	1.05	1.20	2.00	2.65	3.60
No. 505, Cross, finished all over, steel stem with brass wheel	each	1.35	1.80	2.15	3.10	3.90	4.90

WILLIAMS BRASS NEEDLE VALVES **WITH FEMALE UNION MEDIUM PATTERN**

Globe Valve
 Rough Body Iron Wheel
 No. 609, Brass Stem
 No. 507, Steel Stem



FIG. 375

Cross Valve
 Rough Body Iron Wheel
 No. 611, Brass Stem
 No. 509, Steel Stem



FIG. 376

Angle Valve
 Rough Body Iron Wheel
 No. 610, Brass Stem
 No. 508, Steel Stem



FIG. 377

These valves are identically the same as those shown on the preceding page, with the exception that these are provided with female unions on the outlet ends, to facilitate their connection to the pipe.

Valves with brass stems are furnished with two styles of seat openings. The large seat opening A is regularly furnished on all orders for brass stem valves, while the small seat opening C is furnished only when specified on order. Valves with steel stems will always be furnished with the size seat openings listed under Style B. In ordering, be sure to give figure number and specify whether brass or steel stem valves are wanted, otherwise brass stem valves will always be furnished.

Style of Seat Opening	Size of Valve.....inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
A	Diameter of Seat Opening, regularly furnished in all valves with brass stem..in.	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{5}{8}$	$\frac{7}{8}$	$\frac{5}{8}$
B	Diameter of Seat Opening, regularly furnished in all valves with steel stem..in.	$\frac{3}{4}$	$\frac{1}{8}$	$\frac{1}{2}$	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{1}{4}$
C	Diameter of Seat Opening, furnished on order only, in valves with brass stem.in.	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{3}{8}$
No. 609, Globe, Rough, with brass stem and iron wheel	each	\$0.80	.95	1.15	1.95	3.10	4.00
No. 610, Angle, Rough, with brass stem and iron wheel	each	.80	.95	1.15	1.95	3.10	4.00
No. 611, Cross, Rough, with brass stem and iron wheel	each	1.10	1.45	1.75	2.75	4.10	5.10
No. 510, Globe, finished all over, brass stem, with brass wheel	each	1.20	1.35	1.50	2.60	3.50	4.50
No. 512, Angle, finished all over, brass stem, with brass wheel	each	1.20	1.35	1.50	2.60	3.50	4.50
No. 514, Cross, finished all over, brass stem, with brass wheel	each	1.60	2.15	2.50	3.10	4.70	5.70
No. 507, Globe, Rough, with steel stem and iron wheel	each	.75	.95	1.10	1.75	2.50	3.50
No. 508, Angle, Rough, with steel stem and iron wheel	each	.75	.95	1.10	1.75	2.50	3.50
No. 509, Cross, Rough, with steel stem and iron wheel	each	1.05	1.55	1.75	2.55	3.45	4.45
No. 511, Globe, finished all over, steel stem, with brass wheel	each	1.15	1.30	1.45	2.40	3.15	4.15
No. 513, Angle, finished all over, steel stem, with brass wheel	each	1.15	1.30	1.45	2.40	3.15	4.15
No. 516, Cross, finished all over, steel stem, with brass wheel	each	1.55	2.05	2.40	3.50	4.65	5.65

DETROIT GASOLINE NOZZLE VALVES

PACKED TYPE

No. 172



FIG. 378

The No. 172 Detroit Gasoline Valve is of the packed type, and is designed for direct connection to gasoline pumps.

The Valve is furnished in either lever or round handle type, and with Standard Chicago hose connection thread.

This valve is made in 1-in. size only.....\$4.30

No. 173

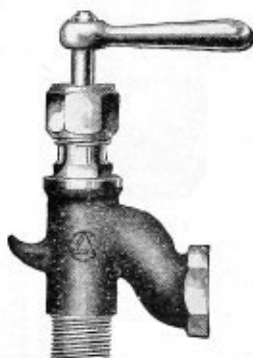


FIG. 379

No. 173 similar to No. 172.

Made in $\frac{3}{4}$ -in. size only, each.....\$4.00

STANDARD IRON BODY VALVES BRASS MOUNTED

Globe



FIG. 380

Angle



FIG. 381

Cross



FIG. 382

Size	inches	1	1 1/4	1 1/2	2	2 1/2	3
Price globe or angle, screwed	each	\$2.25	\$2.75	\$3.50	\$5.40	\$7.35	\$9.80
" " " flanged .....	"	.....	.....	.....	7.00	9.00	12.50
" cross valves, screwed .....	"	.....	.....	.....	6.50	9.00	12.50
" " " flanged .....	"	.....	.....	.....	9.00	11.75	16.50

WITH OUTSIDE SCREW AND YOKE

Globe



FIG. 383

Angle



FIG. 384

Cross



FIG. 385

Size	inches	2	2 1/2	3	3 1/2	4	4 1/2	5	6
Price globe or angle, screwed, each		\$7.00	\$9.00	\$12.50	\$15.25	\$19.00	\$24.00	\$27.00	\$37.50
" " " flanged, "		8.60	10.75	15.00	18.50	22.50	27.50	31.00	42.00
" cross valves, screwed "				16.25	20.00	23.50	30.65	35.25	47.25
" " " flanged "				20.00	25.00	28.50	36.00	41.00	54.00

Size	inches	7	8	10	12	14	15	16	.....
Price globe or angle, screwed, each		\$63.00	72.00	114.00	170.00	.....	.....	.....	.....
" " " flanged, "		68.00	77.00	123.00	187.00	350.00	425.00	475.00	.....
" cross valves, screwed "		78.00	92.00	162.00	240.00	.....	.....	.....	.....
" " " flanged "		85.00	100.00	175.00	265.00	.....	.....	.....	.....

EXTRA HEAVY GLOBE, ANGLE AND CROSS VALVES

SCREWED AND FLANGED

FERROSTEEL WITH YOKE HARD METAL SEATS
 FOR STEAM WORKING PRESSURES UP TO 250 POUNDS
 TESTED TO 800 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH

Globe



FIG. 386

Angle



FIG. 387

Cross



FIG. 388

PRICES GLOBE AND ANGLE VALVES

Size	inches	2	2½	3	3½	4	4½	5
Price, Screwed	each	\$26.00	33.00	37.00	42.00	46.00	56.00	61.00
Price, Flanged	each	27.50	35.00	40.00	45.00	50.00	60.00	65.00
Flanged, with By-Pass.....	each							
Size	inches	6	7	8	10	12	14	15
Price, Screwed	each	\$75.00	95.00	114.00	190.00			
Price, Flanged	each	80.00	100.00	120.00	200.00			
Flanged, with By-Pass.....	each	110.00	130.00	150.00	250.00	350.00	450.00	450.00

PRICES CROSS VALVES

Size	inches	2	2½	3	3½	4	4½	5
Price, Screwed	each	\$33.00	40.00	45.00	50.00	55.00	70.00	75.00
Price, Flanged	each	35.00	43.00	50.00	55.00	60.00	75.00	80.00
Flanged, with By-Pass.....	each							
Size	inches	6	7	8	10	12	14	15
Price, Screwed	each	\$95.00	120.00	145.00	240.00			
Price, Flanged	each	130.00	155.00	180.00	300.00	425.00	550.00	550.00
Flanged, with By-Pass	each	130.00	155.00	180.00	300.00	425.00	550.00	550.00

We do not recommend the use of Screwed Valves larger than 6 inch. It is desirable that all Valves, 6 inch and larger, have a By-Pass.

WILLIAMS IRON BODY REGRINDING GLOBE, ANGLE AND CROSS VALVES

OUTSIDE SCREW AND YOKE MEDIUM AND HEAVY PATTERNS
SCREWED AND FLANGED ENDS

Globe

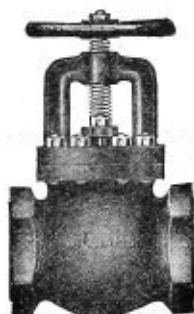


FIG. 389

Angle



FIG. 390

Cross

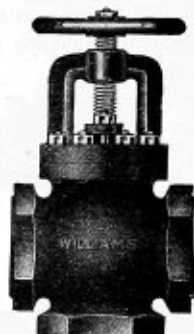


FIG. 391

MEDIUM PATTERN, SCREW ENDS, FOR PRESSURES UP TO 125 LBS.

Size	inches	2	2½	3	3½	4	4½
Angle and Globe Valves.....	each	\$ 7.00	9.00	12.50	15.25	19.00	24.00
Cross Valves	each	8.50	11.75	16.25	20.00	23.50	30.65
Size	inches	5	6	7	8	10	12
Angle and Globe Valves.....	each	\$27.00	37.50	63.00	72.00	114.00	170.00
Cross Valves	each	35.25	47.25	78.00	92.00	162.00	240.00

MEDIUM PATTERN, FLANGE ENDS, FOR PRESSURES UP TO 125 LBS.

Size	inches	2	2½	3	3½	4	4½
Angle and Globe Valves.....	each	\$ 8.60	10.75	15.00	18.50	22.50	27.50
Cross Valves	each	11.00	14.50	20.00	25.00	28.50	36.00
Size	inches	5	6	7	8	10	12
Angle and Globe Valves.....	each	\$31.00	42.00	68.00	77.00	123.00	187.00
Cross Valves	each	41.00	54.00	85.00	100.00	175.00	265.00

HEAVY PATTERN, SCREW ENDS, FOR PRESSURES UP TO 175 LBS.

Size	inches	2	2½	3	3½	4	4½
Angle and Globe Valves.....	each	\$ 7.00	9.00	12.50	15.25	19.00	24.00
Cross Valves	each	8.50	11.75	16.25	20.00	23.50	30.65
Size	inches	5	6	7	8	10	12
Angle and Globe Valves.....	each	\$27.00	37.50	63.00	72.00	114.00	170.00
Cross Valves	each	35.25	47.25	78.00	92.00	162.00	240.00

HEAVY PATTERN, FLANGE ENDS, FOR PRESSURES UP TO 175 LBS.

Size	inches	2	2½	3	3½	4	4½
Globe and Angle Valves.....	each	\$11.00	13.50	18.00	22.00	26.00	32.00
Cross Valves	each	14.50	18.50	24.50	30.00	34.00	42.00
Size	inches	5	6	7	8	10	12
Globe and Angle Valves.....	each	\$35.00	48.00	75.00	85.00	130.00	200.00
Cross Valves	each	48.00	63.00	95.00	110.00	190.00	280.00

JENKINS BROS.' IRON BODY VALVES

Globe, Brass Hub



FIG. 392

Angle, with Yoke



FIG. 393

Cross, with Yoke



FIG. 394

Size .....inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Globe & A. valves, brass hub, screwed	\$2.80	\$3.00	\$4.00	\$5.00	\$7.25	\$11.00	\$16.00	.....
Globe & A. valves, brass hub, flanged	3.80	4.40	5.40	6.60	8.50	13.00	18.00	.....
Globe & A. valves with yoke, screwed .....	.....	.....	.....	.....	10.00	12.00	16.75	\$19.50
Globe & A. valves with yoke, flanged .....	.....	.....	.....	.....	11.75	14.00	18.50	21.50
Cross valves, screwed....	.....	.....	.....	.....	.....	16.00	21.00	26.00
Cross valves, flanged....	.....	.....	.....	.....	.....	19.00	24.00	29.00

Size.....inches	4	$4\frac{1}{2}$	5	6	7	8	10	12
Globe & A. valves, brass hub, screwed .....	.....	.....	.....	.....	.....	.....	.....	.....
Globe & A. valves, brass hub, flanged .....	.....	.....	.....	.....	.....	.....	.....	.....
Globe & A. valves, with yoke, screwed	\$24.00	32.00	40.00	48.00	80.00	90.00	130.00	185.00
Globe & A. valves, with yoke, flanged	26.00	34.00	42.00	50.00	80.00	90.00	130.00	185.00
Cross valves, screwed....	30.00	42.00	45.00	58.00	90.00	.....	.....	.....
Cross valves, flanged....	33.00	45.00	48.00	62.00	90.00	.....	.....	.....



FIG. 395

JENKINS BROS.' EXTRA HEAVY IRON BODY VALVES

FOR WORKING PRESSURES TO 250 POUNDS
PRICES GLOBE OR ANGLE PATTERN

Sizes.....	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Screwed	\$16.00	\$19.00	\$24.00	\$28.00
Flanged	18.00	21.00	26.00	30.00
Sizes.....	4	$4\frac{1}{2}$	5	
Screwed	\$38.00	\$44.00	\$53.00	
Flanged	40.00	46.00	55.00	
Sizes.....	6	7	8	
Screwed	\$70.00	\$100.00	\$110.00	
Flanged	73.00	100.00	110.00	
Sizes.....	9	10	12	
Screwed	\$165.00	\$180.00	\$230.00	
Flanged	165.00	180.00	230.00	

STANDARD IRON BODY CHECK VALVES

Horizontal



FIG. 396

Vertical



FIG. 397

Swing



FIG. 398

HORIZONTAL—SCREWED

Size	inches	2	2½	3	3½	4	4½	5	6
Price	each	\$3.60	6.50	8.90	12.25	14.25	19.00	22.00	30.00

HORIZONTAL—FLANGED

Size	inches	3	4	5	6	7	8	10	12	14	15
Price	each	\$11.50	18.00	26.00	35.00	50.00	62.00	115.00	175.00	300.00	375.00
Diam. flanges....in.		7½	9	10	11	12½	13½	16	19	21	22½

VERTICAL—SCREWED

Size	inches	2½	3	3½	4	4½	5	6
Price	each	\$9.50	12.50	17.00	21.00	30.00	33.00	40.00

VERTICAL—FLANGED

Size	inches	6	7	8	10
Price	each	\$45.00	67.00	78.00	135.00
Diameter of flanges	inches	11	12½	13½	16

SWING—SCREWED

Size	inches	2½	3	3½	4	4½	5	6	7	8	10	12
Price	each	\$12.00	13.50	17.50	20.00	26.00	30.00	36.00	55.00	70.00	110.00	160.00

SWING—FLANGED

Size	inches	2½	3	3½	4	4½	5	6	7	8	10
Diam. of flanges...in.		7	7½	8½	9	9¾	10	11	12½	13½	16
Price	each	\$14.50	17.00	21.00	24.00	30.00	34.00	41.00	60.00	75.00	115.00
Hub end	each		\$19.00		27.00		38.00	45.00		82.50	125.00
Size	in.	12	14	15	16	18	20	24	30		
Diameter of flanges...in.		19	21	22¼	23½	25	27½	32	38¾		
Price	each	\$168.00	340.00	400.00	450.00	600.00	700.00	1000.00	1650.00		
Hub end	each	\$185.00	340.00		450.00	600.00	700.00	1000.00	1650.00		

WILLIAMS IRON BODY REGRINDING CHECK VALVES SCREWED AND FLANGED ENDS, MEDIUM AND HEAVY PATTERNS

Horizontal Check Valve

Angle Check Valve

Vertical

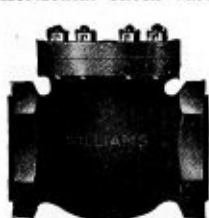


FIG. 399



FIG. 400



FIG. 401

MEDIUM PATTERN, SCREW ENDS, FOR PRESSURES UP TO 125 LBS.

Size	inches	2	2½	3	3½	4	4½
Horizontal, Angle and Vertical.....	each	\$ 3.60	6.50	8.90	12.25	14.25	19.00
Size	inches	5	6	7	8	10	12
Horizontal, Angle and Vertical.....	each	\$22.00	30.00	45.00	57.00	105.00	155.00

HEAVY PATTERN, SCREW ENDS, FOR PRESSURES UP TO 175 LBS.

Size	inches	2	2½	3	3½	4	4½
Horizontal, Angle and Vertical.....	each	\$ 3.60	6.50	8.90	12.25	14.25	19.00
Size	inches	5	6	7	8	10	12
Horizontal, Angle and Vertical.....	each	\$22.00	30.00	45.00	57.00	105.00	155.00

MEDIUM PATTERN FLANGE ENDS, FOR PRESSURES UP TO 125 LBS.

Size	inches	2	2½	3	3½	4	4½
Horizontal, Angle and Vertical.....	each	\$ 5.25	8.25	11.50	15.50	18.00	22.50
Size	inches	5	6	7	8	10	12
Horizontal, Angle and Vertical.....	each	\$26.00	35.00	50.00	62.00	115.00	175.00

HEAVY PATTERN, FLANGE ENDS, FOR PRESSURES UP TO 175 LBS.

Size	inches	2	2½	3	3½	4	4½
Horizontal, Angle and Vertical.....	each	\$ 7.50	11.00	17.00	19.00	21.50	26.50
Size	inches	5	6	7	8	10	12
Horizontal, Angle and Vertical.....	each	\$31.00	41.00	57.00	69.00	130.00	190.00

Screw Ends



FIG. 402

WILLIAMS IRON BODY REGRINDING SWING CHECK VALVES

MEDIUM PATTERN,
FOR PRESSURES UP TO 125 LBS.HEAVY PATTERN,
FOR PRESSURES UP TO 175 LBS.

Flange Ends



FIG. 403

Size	inches	2	2½	3	3½	4	4½	5	6	7	8
Medium, screw ends.....	each	\$6.25	10.00	12.00	16.00	18.00	21.00	25.00	32.00	41.00	50.00
Heavy, screw ends.....	each	6.25	10.00	12.00	16.00	18.00	21.00	25.00	32.00	41.00	50.00
Medium, flange ends.....	each	8.00	12.00	14.50	19.00	21.00	24.50	29.00	37.00	46.00	55.00
Heavy, flange ends.....	each	11.00	15.50	18.00	23.00	25.50	29.50	35.00	44.00	54.00	64.00

JENKINS BROS.' IRON BODY CHECK VALVES

Horizontal Screwed



FIG. 404

Horizontal Flanged



FIG. 405

Angle Screwed



FIG. 406

Size	inches	2	2½	3	3½	4
Horizontal, angle and vertical, screwed		\$8.00	\$11.00	\$14.00	\$17.00	\$20.00
Horizontal, angle and vertical, flanged		10.00	13.00	16.50	20.00	23.00

Size	inches	4½	5	6	7	8
Horizontal, angle and vertical, screwed		\$25.00	\$30.00	\$40.00	\$65.00	\$80.00
Horizontal, angle and vertical, flanged		28.00	33.00	43.00	65.00	80.00

JENKINS BROS.' IRON BODY SWING CHECK VALVES



FIG. 407

IRON BODY

Size	inches	2	2½	3	3½	4	5	6	8	10
Iron body, screwed		\$13.50	13.50	15.50	20.00	23.00	34.00	40.00	77.50	120.00
Iron body, flanged		16.00	19.00	23.50	27.00	38.00	66.00	82.50	125.00	

DRAPER IRON BODY EXTRA HEAVY BALL CHECK VALVE

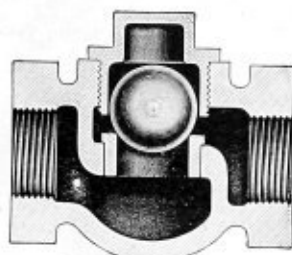


FIG. 408

These valves (from $\frac{3}{4}$ -inch up) are made with iron bodies and brass caps, seats and balls, and being very heavy, do not pound out of shape.

The iron body is practically indestructible, and the brass parts can all be renewed.

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	5
Price, Screwed	each	\$1.50	1.75	2.50	\$3.50	5.00	8.00	13.50	20.00	30.00	45.00

EXTRA HEAVY SWING CHECK VALVES



FIG. 409

FERROSTEEL HARD METAL SEATS

FOR STEAM WORKING PRESSURES
UP TO 250 POUNDS

TESTED TO 800 POUNDS
HYDRAULIC PRESSURE
PER SQUARE INCH

MAY BE USED IN HORIZONTAL
POSITION OR FOR UPWARD FLOW

SCREWED AND FLANGED

Size	inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5
No. 38 E, Screwed	each	\$15.00	20.00	28.00	36.00	41.00	49.00	54.00
No. 39 E, Flanged	each	17.00	22.00	30.00	38.00	44.00	52.00	57.00
End to End, Screwed	inches	$9\frac{1}{2}$	$10\frac{3}{4}$	$11\frac{3}{4}$	$12\frac{1}{4}$	13	14	15
Face to Face, Flanged	inches	$10\frac{1}{2}$	$11\frac{1}{2}$	$12\frac{1}{2}$	$13\frac{1}{4}$	14	15	$15\frac{3}{4}$
Diameter Flanges	inches	$6\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{4}$	9	10	$10\frac{1}{2}$	11

Size	inches	6	7	8	10	12	14	15
No. 38 E, Screwed	each	\$66.00	84.00	100.00	170.00	.....	.....	.....
No. 39 E, Flanged	each	70.00	88.00	105.00	175.00	250.00	350.00	350.00
End to End, Screwed	inches	$16\frac{1}{2}$	$18\frac{1}{4}$	20	$23\frac{1}{4}$	.....	.....	.....
Face to Face, Flanged	inches	$17\frac{1}{2}$	$19\frac{1}{4}$	21	$24\frac{1}{2}$	28	33	33
Diameter Flanges	inches	$12\frac{1}{2}$	14	15	$17\frac{1}{2}$	$20\frac{1}{2}$	23	$24\frac{1}{2}$

STANDARD IRON BODY GATE VALVES
BRASS TRIMMINGS, WEDGE GATE, OPEN TO LEFT
SCREWED AND FLANGED
FOR STEAM WORKING PRESSURES
SIZES 16 INCH AND SMALLER, UP TO 125 POUNDS
SIZES 18 INCH AND LARGER, UP TO 100 POUNDS

Screwed, No. 460
 Non-Rising Stem

Non-Rising Stem
 Flanged, No. 461

Outside Screw and Yoke
 Flanged, No. 465



FIG. 410



FIG. 411



FIG. 412

PRICES NON-RISING STEM GATE VALVES

Size	inches	2	2½	3	3½	4	4½	5	6
No. 460, Screwed.....	each	\$10.00	11.50	14.00	17.00	19.00	24.00	27.50	32.50
No. 461, Flanged.....	each	12.00	13.50	16.50	19.50	23.00	28.00	31.50	36.50
E. to E., Screwed.....	inches	5 5/16	5 5/8	6 1/8	6 3/4	6 7/8	7 1/4	7 3/4	7 3/4
F. to F., Flanged.....	inches	7	7 1/2	8	8 3/4	9	9 1/2	10	11
Diam. Flanges	inches	6	7	7 1/2	8 3/4	9	9 3/4	10	11

Size	inches	7	8	9	10	12	14	15	16
No. 460, Screwed.....	each	\$45.00	54.00	76.00	90.00	125.00	.....	.....	.....
No. 461, Flanged.....	each	49.00	58.00	81.00	95.00	133.00	181.00	220.00	260.00
E. to E., Screwed.....	inches	8 1/4	8 1/2	9 1/4	9 3/4	11 1/8	.....	.....	.....
F. to F., Flanged.....	inches	7	7 1/2	8	8 1/2	14	15	16	16
Diam. Flanges	inches	12 1/2	13 1/2	15	16	19	21	22 1/4	23 1/2

Size	inches	18	20	22	24	26	28	30
No. 461, Flanged.....	each	\$350.00	425.00	530.00	600.00	\$800.00	950.00	1100.00
F. to F., Flanged.....	inches	17	18	19	20	23	26	30
Diam. Flanges	inches	25	27 1/2	29 1/2	32	34 1/4	36 1/4	38 3/4

PRICES, OUTSIDE SCREW AND YOKE GATE VALVES

Size	inches	2	2½	3	3½	4	4½	5	6
No. 464, with Steel Stem, Scrd. each		\$17.50	19.00	22.00	25.00	30.00	37.00	42.00	48.00
No. 465, with Steel Stem, Flgd. each		19.50	21.00	24.50	27.50	34.00	41.00	48.00	52.00
No. 464½, with Brass Stem, Scrd. ea.		19.00	20.50	23.00	26.00	32.50	40.00	45.00	52.00
No. 465½, with Brass Stem, Flgd. ea.		21.00	22.50	26.00	29.50	36.50	44.00	49.00	56.00

Size	inches	7	8	9	10	12	14	15	16
No. 464, with Steel Stem, Scrd. each		\$64.00	80.00	105.00	122.00	160.00	.....	.....	.....
No. 465, with Steel Stem, Flgd. ea.		68.00	84.00	110.00	127.00	168.00	236.00	285.00	325.00
No. 464½, with Brass Stem, Scrd. ea.		69.00	86.00	113.00	131.00	172.00	.....	.....	.....
No. 465½, with Brass Stem, Flgd. ea.		73.00	90.00	118.00	136.00	180.00	255.00	310.00	350.00

Size	inches	18	20	22	24	26	28	30
No. 465, with Steel Stem, Flanged, each		\$435.00	525.00	650.00	725.00	950.00	1125.00	1300.00
No. 465½, with Brass Stem, Flgd., each		470.00	565.00	100.00	775.00	1025.00	1210.00	1400.00

The outside screw and yoke dimensions are same as non-rising gate valves listed above. For drilling template, see page 78.



FIG. 413

STANDARD IRON BODY GATE VALVES

WATER GATES
HUB END BRASS TRIMMINGS WEDGE GATE
OPEN TO THE LEFT NON-RISING STEM

FOR WATER WORKING PRESSURES
SIZES 12 INCH AND SMALLER, UP TO 175 POUNDS
SIZES 14 AND 16 INCH, UP TO 150 POUNDS
SIZES 18 INCH AND LARGER, UP TO 120 POUNDS

TESTED TO 300 POUNDS HYDRAULIC PRESSURE

These Valves will be furnished "Open to the Right" when so ordered, at same price.

All Valves 20 inch and smaller have 2 inch square head on stem; 24 inch and larger have 3 inch square head on stem. Stuffing boxes have bolted followers.

Hubs are usually furnished rough—if bored hubs are required orders should so specify.

Size	inches	2	3	4	5	6	7	8	10
Price	each	\$ 10.00	14.00	19.00	27.50	32.50	45.00	54.00	90.00
For Matheson or Converse									
Joint Pipe	each			19.00		32.50		54.00	90.00
End to End	inches	8½	9	10¼	10¼	10¾	10¾	12	12¾

No. 471	Size	inches	12	14	16	18	20	24	30
Price	each	\$125.00	173.00	250.00	340.00	415.00	590.00	1075.00	
Price, with									
By-Pass	each			315.00	415.00	500.00	690.00	1225.00	
End to End	inches	13½	13¾	16	17	17	18	30	

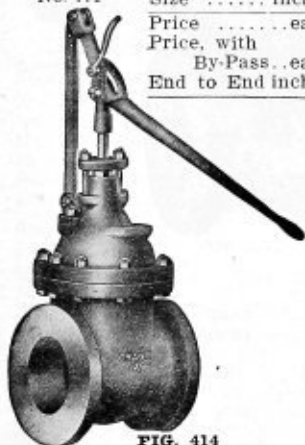


FIG. 414

STANDARD IRON BODY QUICK
OPENING GATE VALVES

WEDGE GATE SLIDING STEM
FOR STEAM WORKING PRESSURES
UP TO 125 POUNDS

SCREWED AND FLANGED

Size	inches	2	2½	3	3½	4	4½	5	6
No. 470, Screwed	each	\$17.50	19.00	22.00	25.00	30.00	37.00	42.00	48.00
No. 471, Flanged	each	19.50	21.00	24.50	27.50	34.00	41.00	46.00	52.00
End to End, Screwed	inches	5½	5¾	6½	6½	6¾	7¼	7½	7¾
Face to Face, Flanged	inches	7	7½	8	8½	9	9½	10	10½
Diam. of Flanges	inches	6	7	7½	8½	9	9¼	10	11

Size	inches	7	8	9	10	12	14	15	16
No. 470, Screwed	each	\$64.00	80.00	105.00	122.00	160.00			
No. 471, Flanged	each	68.00	84.00	110.00	127.00	168.00	236.00	285.00	325.00
End to End, Screwed	inches	8¼	8½	9¼	9¾	11½			
Face to Face, Flanged	inches	11	11½	12	13	14	15	15	16
Diam. of Flanges	inches	12½	13½	15	16	19	21	22¼	23½

For drilling template, see page 78.

MEDIUM GATE VALVES

FERROSTEEL BODY CRANE SPECIAL BRASS SEATS WEDGE GATE
 OPEN TO THE LEFT NON-RISING STEM PATENTED
 FOR STEAM AND WATER WORKING PRESSURES, ACCORDING TO
 SIZE, VIZ.

STEAM { SIZES 16 INCH AND SMALLER UP TO 175 POUNDS
 { SIZE 18 INCH UP TO 150 POUNDS
 WATER { SIZES 12 INCH AND SMALLER UP TO 250 POUNDS
 { SIZES 14 INCH AND LARGER UP TO 200 POUNDS

TESTED TO 500 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH

No. 501



FIG. 415

No. 503



FIG. 416

Size inches	2	2½	3	3½	4	4½	5	6	7
No. 500, Screwed . . . each	\$15.00	17.00	20.00	25.00	28.00	35.00	40.00	50.00	75.00
No. 501, Flanged . . . each	17.50	19.50	23.00	28.00	33.00	40.00	45.00	57.00	82.00
No. 503, Flanged . . . each								85.00	110.00
End to End, Screwed . . in.	5½	6	7¼	7½	7¾	8¼	8½	8¾	9¼
Face to Face, Flanged . in.	7½	8	9¼	10	10½	11	11½	12	12½
Diam. of Flanges . . . in.	6½	7½	8¼	9	10	10½	11	12½	14

Size inches	8	9	10	12	14	15	16	18	20
No. 500, Screwed . . . each	\$87.00	120.00	145.00	185.00	230.00	300.00	350.00	400.00	575.00
No. 501, Flanged . . . each	94.00	127.00	153.00	195.00	230.00	300.00	350.00	400.00	575.00
No. 503, Flanged . . . each	125.00	158.00	185.00	230.00	300.00	350.00	400.00	575.00	
End to End, Screwed . . in.	10	10¾	11½	12½	13	13½	14	14½	15
Face to Face, Flanged . in.	13½	14	15	16	18	18¾	19½	21	22
Diam. of Flanges . . . in.	15	16¼	17½	20½	23	24½	25½	28	30

We do not recommend the use of screwed Valves larger than 6-inch. It is desirable that Valves 6 inch and larger have a By-Pass.

We have patterns and can furnish promptly, sizes up to and including 24 inch. Prices on application.

For Drilling Template see page 93.

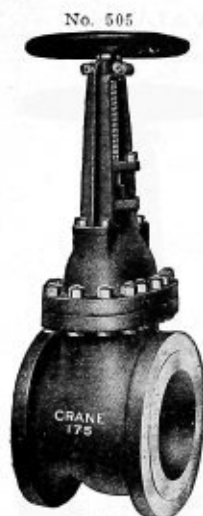


FIG. 417

MEDIUM GATE VALVES

FERROSTEEL BODY
CRANE SPECIAL BRASS SEATS
WEDGE GATE OPEN TO THE LEFT
PATENTED

FOR STEAM AND WATER WORKING
PRESSURES, ACCORDING TO
SIZE, VIZ.:

STEAM { SIZES 16 INCH AND SMALLER, UP TO 175 POUNDS
SIZES 18 INCH AND LARGER, UP TO 150 POUNDS

WATER { SIZES 12 INCH AND SMALLER, UP TO 250 POUNDS
SIZES 14 INCH AND LARGER, UP TO 200 POUNDS

TESTED TO 500 POUNDS HYDRAULIC PRESSURE PER SQUARE INCH

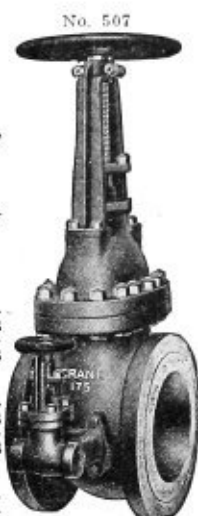


FIG. 418

Size	inches	2	2½	3	3½	4
No. 504, Screwed	each	\$ 23.00	25.00	29.00	35.00	40.00
No. 505, Flanged	each	25.50	27.50	32.00	38.00	40.00
No. 507, Flanged	each					
End to End, Screwed	in.	5½	6	7¼	7½	7¾
Face to Face, Flanged	in.	7½	8	9½	10	10½
Diam. of Flanges	in.	6¼	7½	8¼	9	10
Size	inches	4½	5	6	7	8
No. 504, Screwed	each	\$ 50.00	54.00	65.00	90.00	110.00
No. 505, Flanged	each	55.00	59.00	72.00	97.00	117.00
No. 507, Flanged	each			100.00	125.00	148.00
End to End, Screwed	in.	8¼	8½	8¾	9¼	10
Face to Face, Flanged	in.	11	11½	12	12½	13½
Diam. of Flanges	in.	10½	11	12½	14	15
Size	inches	9	10	12	14	15
No. 504, Screwed	each	\$145.00	170.00	215.00		
No. 505, Flanged	each	152.00	178.00	225.00	340.00	400.00
No. 507, Flanged	each	183.00	210.00	260.00	390.00	450.00
End to End, Screwed	in.	10¾	11½	12½		
Face to Face, Flanged	in.	14	15	16	18	18¾
Diam. of Flanges	in.	16¼	17½	20½	23	24½
Size	inches	16	18	20	24	
No. 504, Screwed	each					
No. 505, Flanged	each	\$450.00	600.00	775.00	1175.00	
No. 507, Flanged	each	510.00	660.00	850.00	1250.00	
End to End, Screwed	in.					
Face to Face, Flanged	in.	19½	21	22½	25½	
Diam. of Flanges	in.	25½	28	30½	36	

The outside screw indicates whether valve is open, partly open or closed.
It is desirable that all valves 6 inches and larger have a by-pass.
Templates for drilling, page 93.

EXTRA HEAVY IRON BODY GATE VALVES SCREWED AND FLANGED

Outside Screw and Yoke
No. 7 E

With By-Pass
No. 9 E

Non-Rising Stem
No. 3 E



FIG. 419

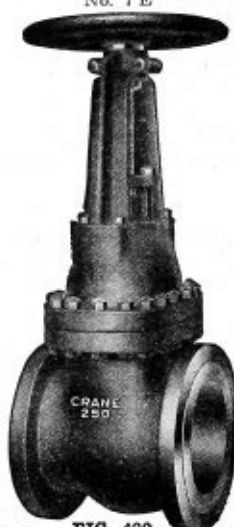


FIG. 420



FIG. 421

NON-RISING STEM GATE VALVES, 250 LBS. PRESSURE

Size	inches	1¼	1½	2	2½	3	3½	4	4½	5
No. 2 E, Screwed.....each	\$	24.00	25.00	27.50	33.00	45.00	57.00	60.00	77.00	85.00
No. 3 E, Flanged.....each		26.50	27.50	30.00	35.50	48.00	60.00	65.00	82.00	90.00

Size	inches	6	7	8	9	10	12	14	15	16
No. 2 E, Screwed.....each	\$100.00	125.00	155.00	225.00	250.00	.....	.....	.....	.....	.....
No. 3 E, Flanged.....each	107.00	132.00	162.00	232.00	258.00	335.00	440.00	540.00	675.00	.....
No. 5 E, Flgd., by-pass...	155.00	.....	215.00	.....	310.00	400.00	.....	.....	.....	.....

OUTSIDE SCREW AND YOKE GATE VALVES, 250 LBS. PRESSURE

Size	inches	1¼	1½	2	2½	3	3½	4	4½	5
No. 6 E, Screwed.....each		.....	.....	.....	41.00	54.00	.....	72.00	.....	100.00
No. 7 E, Flanged.....each	\$34.50	35.50	38.00	43.50	57.00	70.00	77.00	97.00	105.00	.....

No. 9 E, Flanged, with by-pass	each	.....	.....	.....	.....	.....	.....	.....	.....	153.00
End to End, Screwed.....inches		.....	.....	.....	8	9	.....	11	.....	13½
Face to Face, Flanged.....inches		6½	7½	8½	9½	11½	11¾	12	13¼	15
Diameter Flanges.....inches		5	6	6½	7½	8¾	9	10	10½	11
Size, by-pass	inches	.....	.....	.....	.....	.....	.....	.....	.....	1¼

Size	inches	6	7	8	9	10	12	14	15	16
No. 7 E, Flanged.....each	\$122.00	147.00	187.00	257.00	283.00	390.00	510.00	610.00	750.00	.....
No. 9 E, Flanged, with by-pass	each	170.00	195.00	240.00	310.00	335.00	455.00	580.00	680.00	825.00
Face to Face, Flanged, in.		15¼	16¼	16½	17	18	19¾	22¾	22½	24
Diameter Flanges.....in.		12½	14	15	16¼	17½	20½	23	24½	25½
Size, by-pass	in.	1¼	1½	1½	1½	1½	2	2	2	3

Size	inches	18	20	22	24
No. 9 E, Flanged, with by-pass.....each	\$1050.00	1250.00	1575.00	1700.00	.....
Face to Face.....inches		26	28	29½	31
Diameter Flanges	inches	28	30½	33	36
Size, by-pass	inches	3	4	4	4

For drilling template, see page 93.

WILLIAMS "CINO" IRON BODY BRASS MOUNTED GATE VALVES

PLAIN HUB RISING STEM
FOR 100 LBS. WORKING PRESSURE
SIZES $\frac{1}{2}$ TO 4 INCHES

Screwed
No. 300. Iron Body
Brass Mounted
No. 420. All Iron



FIG. 422

Flanged
No. 338. Iron Body
Brass Mounted
No. 406. All Iron

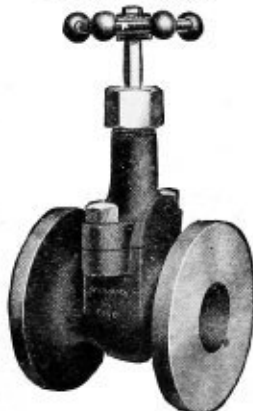


FIG. 423

These illustrations show the exterior construction of our "Cino" Iron Body Brass Mounted Gate Valve, both screwed and flanged ends, as it is regularly furnished in all sizes from $\frac{1}{2}$ up to 4 inches. If desired, we can furnish the "Cino" Valve made entirely of iron, no brass whatever being used in its construction, adapting it for use in controlling cyanides, ammonia, or other liquids or acids that ordinarily affect brass. The "Cino" is also furnished with British Standard threads when specified on order and for which no extra charge is made.

In ordering, please give figure number, otherwise we will assume that No. 300 Iron Body Brass Mounted with Screwed Ends is desired and will fill all orders accordingly.

All "Cino" Valves are carefully tested and inspected before shipment and are guaranteed to stand a constant working pressure of 100 lbs. per square inch. They are extensively used in mines, oil and gas wells, chemical plants, breweries, distilleries, tanneries, etc., and will give excellent satisfaction wherever used.

PRICE LIST

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
No. 300, Iron Body, Brass Mounted, screw ends, each		\$1.50	1.90	2.50	3.50	5.00	7.50	12.00	15.00	18.00	20.00
No. 338, Iron Body, Brass Mounted, flange ends, each				3.00	4.90	6.00	8.50	13.50	16.90	20.30	22.50
No. 420, All Iron, screw ends, each		1.50	1.90	2.50	3.50	5.00	7.50	12.00	15.00	18.00	20.00
No. 406, All Iron, flange ends, each				3.00	4.90	6.00	8.50	13.50	16.90	20.30	22.50

JENKINS BROS. MEDIUM PRESSURE IRON BODY GATE VALVES

COMPOSITION MOUNTED

SUITABLE FOR 175 POUNDS WORKING STEAM PRESSURE

SCREWED AND FLANGED

Inside Screw
Stationary Spindle
Screwed



FIG. 424

Outside Screw and
Yoke, Rising Spindle
Flanged



FIG. 425

Outside Screw and Yoke
Rising Spindle with By-Pass
Flanged



FIG. 426

Size	inches	2	2½	3	3½	4
Inside screw, screwed.....	each	\$15.00	17.00	20.00	25.00	28.00
Inside screw, flanged	each	\$17.50	19.50	23.00	28.00	33.00
O. S. & Y., screwed	each	\$23.00	25.00	29.00	35.00	40.00
O. S. & Y., flanged	each	\$25.50	27.50	32.00	38.00	45.00
O. S. & Y., flanged, with by-pass.....	each					

Size	inches	4½	5	6	7
Inside screw, screwed	each	\$35.00	40.00	50.00	75.00
Inside screw, flanged	each	\$40.00	45.00	57.00	82.00
O. S. & Y., screwed	each	\$50.00	54.00	65.00	90.00
O. S. & Y., flanged	each	\$55.00	59.00	72.00	97.00
O. S. & Y., flanged, with by-pass.....	each			\$100.00	125.00

Size	inches	8	9	10	12	14	15	16	18
Inside screw, screwed.....		\$87.00	120.00	145.00	185.00				
Inside screw, flanged.....		\$94.00	127.00	153.00	195.00	300.00	350.00	400.00	
O. S. & Y., screwed		\$110.00	145.00	170.00	215.00				
O. S. & Y., flanged		\$117.00	152.00	178.00	225.00	340.00	400.00	450.00	600.00
O. S. & Y., flanged, with by-pass		\$148.00	183.00	210.00	260.00	390.00	450.00	510.00	660.00

WILLIAMS IRON BODY QUICK OPENING GATE VALVES

SCREW ENDS

BRASS MOUNTED

MEDIUM PATTERN FOR WORKING PRESSURES UP TO 100 POUNDS
HEAVY PATTERN FOR WORKING PRESSURES UP TO 150 POUNDS

Medium
No. 328, Iron, Brass Mounted
No. 231, All Iron

Heavy
No. 132, Iron, Brass
Mounted



FIG. 427



Fig. 428

Just as easy to operate, equally as reliable, these valves combine in their construction all of the desirable features and advantages of the brass throttle valves. Being of iron, they are somewhat lower in price, but this, of course, does not limit the scope of their usefulness, as they are extensively used on railroad tanks, in mines, refineries, paper mills, breweries, as well as on laundry machinery, and when made entirely of iron, they are well adapted for the handling of cyanides, acids or chemicals which would ordinarily deteriorate a brass valve.

They are heavily constructed throughout, the best grade of cast iron being used in the bodies and caps, while the discs seat rings and packing nuts are of the best grade of bronze composition. They are easily and quickly operated, providing, when open, a straightway, unobstructed passage through the body of the valve. The double disc mechanism is positive and thoroughly reliable, insures easy and frictionless operation of the discs, which are so balanced that they will stay at any degree of opening. The ball and socket bearing of the male and female disc makes them self-adjusting, causes them to wear evenly, and insures, when closed, an absolutely tight seat. The flexibility of this double mechanism not only compensates for expansion or contraction strains, but also permits of pressure being applied at either end of the valve and in the event of one disc becoming slightly obstructed in any way, the other disc will make an independently tight seat. All valves are fitted with malleable iron instead of brass carriers, as experience has shown that malleable iron is more durable. The seat rings in both patterns are made of bronze, and like the discs, are interchangeable. A good feature of the Medium Pattern valves is the wrench lever handle, which may be conveniently used for removing the cap screws when necessary.

These valves are carefully tested and inspected and are guaranteed to prove satisfactory.

Size	inches	2	2½	3	3½	4	5	6
No. 328, Med., iron, brass mounted...each		\$7.00	12.00	15.00	18.00	21.00	30.00	35.00
No. 231, Medium, all iron.....each		7.00	12.00	15.00	18.00	21.00	30.00	35.00
No. 132, Heavy, iron, brass mounted...each		8.50	16.00	20.00	25.00	30.00	35.00	40.00

STANDARD IRON BODY THROTTLE VALVES
BRASS TRIMMINGS
FOR STEAM WORKING PRESSURES
UP TO 125 POUNDS

Size	inches	2½	3	3½	4
Price, Screwed	each	\$30.00	40.00	50.00	60.00
End to End	inches	7½	8	8¾	9¾

Full opening in one-quarter turn.



FIG. 429



FIG. 430

STANDARD IRON BODY BUTTERFLY
VALVES

BRASS TRIMMINGS

FOR STEAM WORKING PRESSURES
UP TO 125 POUNDS

Size	inches	2	2½	3	3½	4	5
No. 380, Screwed	each	\$ 8.00	9.50	12.00	16.00	18.50	28.50
No. 381, Flanged	each	9.50	11.50	15.00	19.00	22.00	32.00
End to End, Screwed	inches	4¼	4¾	5¼	5½	6	6¾
Face to Face, Flanged	inches	4¼	4¾	5¼	5½	6	6¾
Diameter Flanges	inches	6	7	7½	8½	9	10
Size	inches	6	8	10	12	14	16
No. 380, Screwed	each	\$42.50	.....	.....	.....	.....	.....
No. 381, Flanged	each	47.00	90.00	125.00	160.00	275.00	350.00
End to End, Screwed	inches	7½	.....	.....	.....	.....	.....
Face to Face, Flanged	inches	7½	9¼	10¾	12½	14	16
Diameter Flanges	inches	11	13½	16	19	21	23½

These Valves are not intended to be steam tight.

Can be made with a brass stem instead of steel stem, at an extra price.



FIG. 431

STEAM SWING JOINTS—BRASS
FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

Size	inches	½x½	¾x¾	1x1	1½x1½
Price, Rough	each	\$2.50	3.50	5.00	6.50
Price, Finished	each	3.00	4.00	5.75	7.25
Size	inches	1½x1½	2x2	2½x2½	3x3
Price, Rough	each	\$9.00	13.00	22.00	30.00
Price, Finished	each	10.00	15.00	24.50	33.00

Finished Swing Joints are made to order only.

LOW PRESSURE COPPER EXPANSION JOINTS **FOR STEAM WORKING PRESSURE UP TO 25 POUNDS**

No. 411, Horizontal or Vertical
 With Cast Iron Swivel Flanges

No. 412, Horizontal or Vertical
 With Cast Steel Split Rings



FIG. 432



FIG. 433

Size .....inches	4	5	6	7	8	9	
No. 411 or 412.....each	\$110.00	125.00	140.00	155.00	170.00	185.00	
F. to F., Flanges, No. 411.....in.	8	9	9	10	10	11	
F. to F., Copper Shell, No. 412.....in.	5½	5½	6	6	6	6	
Diam. Flanges and Rings.....in.	9	10	11	12½	13½	15	
Thickness of Steel Ring, No. 412.....in.	¾	¾	¾	¾	¾	¾	
Size .....inches	10	12	14	15	16	18	20
No. 411 or 412.....each	\$200.00	225.00	250.00	275.00	300.00	350.00	400.00
F. to F., Flanges, No. 411.in.	11	11	12	12	12	13	13
F. to F., Copper Shell, No. 412.....in.	6	6	6	6	6	6½	6½
Diam. Flanges and Rings, in.	16	19	21	22¾	23½	25	27½
Thickness of Steel Ring, No. 412.....in.	½	½	½	½	½	¾	¾
Size .....inches	22	24	26	28	30	32	34
No. 411 or 412.....each	\$450.00	500.00	600.00	650.00	725.00	800.00	875.00
F. to F., Flanges, No. 411.in.	14	14	15	15	16	16	17
F. to F., Copper Shell, No. 412.....in.	7*	7	8	8	8½	8½	8½
Diam. Flanges and Rings, in.	29½	32	34¼	36½	38¾	41¾	43¾
Thickness of Steel Ring, No. 412.....in.	¾	¾	¾	¾	¾	¾	¾
Size .....inches	36	38	40	42	44	46	48
No. 411 or 412.....each	\$950.00	1000.00	1100.00	1200.00	1300.00	1400.00	1500.00
F. to F., Flanges, No. 411.in.	17	18	18	19	19	20	20
F. to F., Copper Shell, No. 412.....in.	8½	9	9	9	9	9	9
Diam. Flanges and Rings, in.	46	48¾	50¾	53	55¼	57¼	59½
Thickness of Steel Ring, No. 412.....in.	1	1	1	1½	1½	1½	1½

These Copper Expansion Joints are recommended for use only where the expansion does not exceed ¼ inch.

Style No. 412 is especially recommended on high vacuum systems, as its construction provides against danger of collapsing, due to external or atmospheric pressure.

No. 411 is furnished faced and drilled, as shown in illustration.

No. 412 comprises the copper shell and Split Rings only, faced and drilled.

Bolts for No. 411 will be regular diameter and length corresponding to thickness of our Standard Cast Iron Flanges.

Bolts for No. 412 will be shorter, proportionate to the difference in thickness of the steel ring, as compared with the thickness of Standard Cast Iron Flanges.

In ordering No. 411, specify whether horizontal or vertical is wanted.

For drilling template, see page 78.

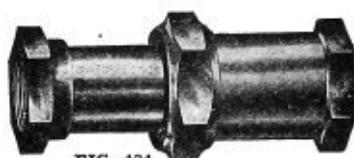


FIG. 434

STANDARD BRASS EXPANSION JOINTS

FOR STEAM WORKING PRESSURES
UP TO 125 POUNDS

NO. 404. SCREWED. STANDARD TRAVERSE

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Traverse	inches	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{3}{4}$
End to End, Open.....	inches	$6\frac{3}{8}$	$7\frac{1}{4}$	$7\frac{3}{8}$	$7\frac{7}{8}$	$7\frac{7}{8}$	$8\frac{3}{8}$	$9\frac{1}{8}$	$10\frac{3}{8}$
Price	each	\$1.50	2.20	2.75	4.00	5.00	8.00	17.50	24.00

NO. 406. SCREWED. SPECIAL TRAVERSE

Traverse Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
4 Inches Price	each	\$3.80	4.00	4.90	6.30	7.40	9.10	.....
6 Inches Price	each	.....	8.25	9.00	10.00	11.50	13.50	24.00
8 Inches Price	each	.....	9.00	10.00	11.25	13.00	15.50	27.00
10 Inches Price	each	.....	9.75	11.00	12.50	14.50	17.50	30.00
12 Inches Price	each	.....	10.50	12.00	13.75	16.00	19.50	33.00

*Eastern Traverse.

Expansion Joints are not furnished packed unless so ordered, and then at a special price. If wanted packed specify kind of packing required.

STANDARD IRON BODY EX- PANSION JOINTS. BRASS SLEEVE

FOR STEAM WORKING PRESSURES
UP TO 125 POUNDS

NO. 398. SCREWED. STANDARD TRAVERSE



FIG. 435

Size	inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5
Traverse	inches	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4
End to End, Opened.....	inches	$11\frac{1}{8}$	$12\frac{1}{4}$	$13\frac{1}{8}$	$14\frac{1}{4}$	$15\frac{1}{4}$	16	$17\frac{1}{4}$
Price	each	\$7.00	8.00	10.00	14.00	18.00	30.00	38.00

Size	inches	6	7	8	9	10	12	.....
Traverse	inches	5	6	7	7	7	8	.....
End to End, Opened.....	inches	$20\frac{1}{4}$	$23\frac{1}{4}$	$26\frac{1}{2}$	27	28	$31\frac{1}{2}$	.....
Price	each	\$45.00	70.00	100.00	110.00	160.00	225.00	.....

NO. 400. SCREWED. SPECIAL TRAVERSE

Traverse Size	In.	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8
6 Inches Price ..	Ea.	\$11.00	13.00	17.50	25.00	30.00	40.00	45.00	55.00	.....	.....
10 Inches Price ..	Ea.	16.00	19.00	25.00	35.00	42.00	52.00	62.00	80.00	100.00	140.00
12 Inches Price ..	Ea.	18.50	22.00	29.00	40.00	48.00	60.00	70.00	92.50	115.00	160.00
14 Inches Price ..	Ea.	21.00	25.00	33.00	45.00	54.00	67.00	78.00	105.00	130.00	.....
16 Inches Price ..	Ea.	23.50	28.00	37.00	50.00	60.00	75.00	86.00	117.50	145.00	.....
18 Inches Price ..	Ea.	26.00	31.00	41.00	55.00	66.00	.....	94.00	130.00	.....	.....

*Eastern Traverse.

No. 400 Expansion Joints, sizes 7 to 12 inch, inclusive, can be furnished with 6 inch Traverse when so ordered. Prices on application.

Expansion Joints are not furnished packed unless so ordered, and then at a special price. If wanted packed specify kind of packing required.

Standard Expansion Joints will be made to order with base or side outlet. Prices on application.

STANDARD IRON BODY EXPANSION JOINTS

BRASS SLEEVE

FOR STEAM WORKING PRESSURES UP TO 125 POUNDS



FIG. 436

NO. 401. FLANGED, STANDARD TRAVERSE

Size	inches	2	2½	3	3½	4	4½	5	6
Traverse	inches	2½	2½	2¾	3	3¼	3½	4	5
Face to Face, opened	inches	11¾	11½	12½	13½	14¾	15½	16¾	19½
Price	each	\$15.00	16.00	18.50	25.00	30.00	40.00	48.00	55.00
Diam. Flanges	inches	6	7	7½	8½	9	9¼	10	11
Size	inches	7	8	9	10	12	14	15	16
Traverse	inches	6	7	7	7	8	10	10	10
Face to Face, opened	inches	22½	25½	26¼	27	30½	39¼	40	41
Price	each	\$80.00	110.00	120.00	175.00	250.00	500.00	550.00	600.00
Diam. Flanges	inches	12½	13½	15	16	19	21	22¼	23½

NO. 403. FLANGED, SPECIAL TRAVERSE

Traverse	Size	inches	2	2½	3	3½	4	4½
*6 inches	Price	each	\$18.00	20.00	25.00	35.00	40.00	50.00
10 inches	Price	each	23.00	26.00	32.50	45.00	52.00	63.00
12 inches	Price	each	25.50	29.00	36.50	50.00	58.00	70.00
14 inches	Price	each	28.00	32.00	40.50	55.00	64.00	77.00
16 inches	Price	each	30.50	35.00	44.50	60.00	70.00	85.00
18 inches	Price	each	33.00	38.00	48.50	65.00	76.00	.....
Traverse	Size	inches	5	6	7	8	10	12
*6 inches	Price	each	\$55.00	65.00	.....	.....	.....	.....
10 inches	Price	each	72.00	90.00	112.00	150.00	225.00	300.00
12 inches	Price	each	80.00	102.50	127.00	170.00	255.00	350.00
14 inches	Price	each	88.00	115.00	142.00	190.00	285.00	400.00
16 inches	Price	each	96.00	127.50	157.00	210.00	315.00	.....
18 inches	Price	each	104.00	140.00	172.00	230.00	350.00	.....

*Eastern Traverse.

No. 403 Expansion Joints, sizes 7 to 16 inch, inclusive, can be furnished with 6-inch Traverse when so ordered. Prices on application.

Expansion Joints are not furnished packed unless so ordered, and then at a special price. If wanted packed specify kind of packing required.

Standard Expansion Joints will be made to order with base or with side outlet. Prices on application.

Templates for drilling, page 78.

JENKINS BROS.' Y OR BLOW-OFF VALVE SCREWED AND FLANGED



FIG. 437

BRASS

Size	inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Screwed	each	\$2.00	2.00	3.00	4.00	5.00	6.50	9.25	18.00	25.00
Price, Flanged	each	5.00	7.00	9.00	11.00	13.00	20.00	28.00	37.00	

IRON BODY

Size	inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6	8
Price, Screwed	each	\$11.00	15.00	20.00	28.00	35.00	59.00	70.00	115.00
Price, Flanged	each	13.00	18.00	23.00	31.00	38.00	64.00	70.00	115.00

EXTRA HEAVY FERROSTEEL BLOW-OFF VALVES FOR STEAM WORKING PRESSURES UP TO 250 POUNDS SCREWED AND FLANGED

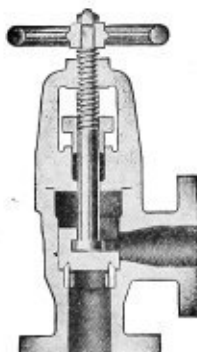


FIG. 438

These Valves should always be installed so that the pressure will come on the top of the discs. They should also be opened wide when blowing off, so as to save the discs and seats from wear. These are very important points, as they concern the lasting qualities of the Valves.

Valves of this style have been generally used for many years with entirely satisfactory results. From the nature of the service, Blow-Off Valves are liable to be cut out by scale or other boiler impurities, and it is essential to have a Valve which may be repaired rapidly and cheaply. To prevent too frequent repairing we make these Valves with an Iron Seat Ring, removable, having the seating surface on the outside of the ring. The disc is also made of iron with a throttling lip, which has a tendency to clean the seat. This construction prevents the scale from lodging between the seat and disc. The use of iron for this service in seat and disc is the result of many years' experience with Valves of this type.

Size	inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
No. 390, Angle, Screwed	each	\$12.00	15.00	20.00	30.00
No. 391, Angle, Flanged	each	15.00	20.00	30.00	
Diameter of Flanges	inches	$6\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{2}$	
Center to Inlet or Outlet, Flanged	inches	5	$5\frac{3}{4}$	$6\frac{3}{4}$	

EXTRA SEATS AND DISCS

Size	inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Extra Seat	each	\$0.60	.80	1.00	1.20
Extra Disc	each	1.30	1.50	1.80	2.20

CADMAN INDESTRUCTIBLE BLOW-OFF VALVE

HEAVY DUTY—1914 PATTERN—SEMI-STEEL

REVERSIBLE MONEL METAL SEAT AND DISC MAKING PRACTICALLY
TWO VALVES IN ONE

The Cadman Indestructible Blow-Off Valve—1914 Pattern—is available at all times for all boilers, including those working under superheated steam up to and including 300 pounds per square inch working pressure.

Size	inches	1½	2	2½
List, Screwed ends.....		\$17.50	23.25	29.00
List, Flanged ends.....		18.00	24.00	30.00
Face of Inlet to Center of Body, in.	4½	4½	5¼	
Center of Inlet to Face of Outlet, in.	5¾	6¾	7½	
Diameter of Flanges.....in.	6	6½	7½	
Length over all Closed.....in.	15½	17¾	20¾	
Length over all Open.....in.	17½	20¾	24½	

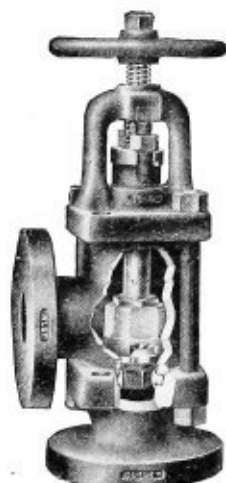


FIG. 439

Valve Closed

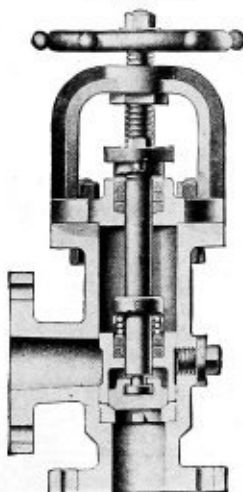


FIG. 440

VANCE DOUBLE DISC BLOW-OFF
VALVE

ANGLE, GLOBE AND STRAIGHTWAY

Size	inches	1½	2	2½	3
Price		\$18.75	23.75	31.25	40.00

Flanged or Screwed.

Companion Flanges Extra.

Valves not shipped flanged and not drilled unless specified.

Specify Monel White Metal Parts. Small Extra Cost.

Write for complete circular.

HOVALCO ANGLE BLOW-OFF VALVES

RENEWABLE, REGRINDABLE, REVERSIBLE

300 POUNDS WORKING PRESSURE



FIG. 441

PRICE LIST

Size	inches	1½	2	2½	3
Screwed		\$22.00	27.00	32.50	41.00
Flanged		23.00	28.32	33.56	43.00
Drilling			.25	.35	.60

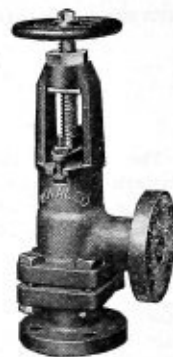


FIG. 442

The Hovalco Angle Blow-Off Valve is the result of several years of careful investigation and close study of all details which go to make for boiler blow-off safety, economy and efficiency.

The Valve body is made of special Semi-Steel. This material is closely grained and extremely tough. For this purpose it is better than an all-steel valve. Its tensile strength is $2\frac{1}{2}$ times as great as the average Cast Iron, and stands a hydraulic test of 1,000 pounds to the square inch.

The Valve Seat is made of a special Alloy which is non-corrosive and which cannot be cut easily. The seat and disc are tapered to a special angle which will not permit any dirt or grit to find a lodging place. Both seat and disc can be easily reground, reversed and renewed.



FIG. 443

HOVALCO-HOMESTEAD
COMBINATION BLOW-OFF
VALVE

Size	Inches	1½	2	2½	3
Price of Double Blow-Off		\$35.00	44.00	59.00	\$5.00
Distance, Back of Valve to Face of Inlet		12 $\frac{1}{16}$	16 $\frac{5}{16}$	18 $\frac{3}{8}$	20 $\frac{1}{2}$

FAIRBANKS "SPHERO" BLOW-OFF VALVES

RENEWABLE VULCABESTON SEAT RINGS

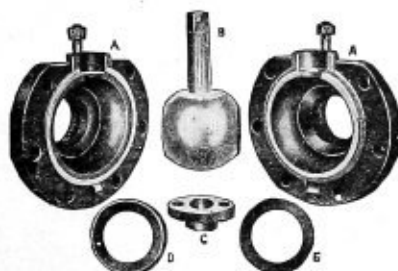


FIG. 444

For 175 and 250 Pounds Working Pressures.

A—Bodies.

C—Follower.

B—Ball Plug.

D—Seat Ring.

E—Seat Ring Gasket

To make the "Sphero" Blow-Off Valve as good as new it is only necessary to remove the old seat rings and seat ring gaskets and substitute new ones.



FIG. 445



FIG. 446

For 175 and 250 Pounds Working Pressures.

In point of service, efficiency and economy there is not a blow-off valve on the market that approaches "Sphero."

The construction is remarkably simple, yet strong enough to withstand conditions of usage to which blow-off valves are subjected.

The body of the "Sphero" Blow-Off Valve is regularly made of iron.

The ball plug is of the best high grade steam bronze. Where brass is affected by the chemical composition of the water, specify iron plug.

The seat rings are of the well-known Fairbanks Vulcabeston and are so constructed and arranged that they can be easily and quickly renewed at small cost and without special tools.

Size	1	1½	1½	2	2½	3
Screw End, 175 pounds.....each	\$8.00	\$10.75	\$13.75	\$19.00	\$25.00	\$35.00
Flange End, 175 pounds....."	8.00	10.75	13.75	19.00	25.00	35.00

THE "OKADEE" BLOW-OFF VALVE

"AN" Type

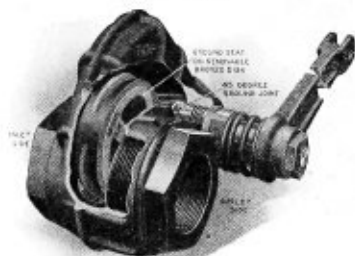


FIG. 447

"FH" Type

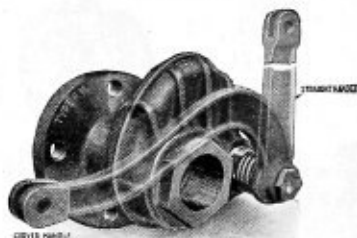


FIG. 448

"WAS" Type



FIG. 449

The "Okadee" Valve has a "one-piece" body, straight through "blow" and few repair parts. Inner parts accessible without necessity of removing valve from point of application.

Every valve before packed for shipment is subjected to 500 pounds per square inch hydraulic pressure and die-stamped by inspector.

"AN" is screw type; "FH" is flanged type; "WAS" is worm and sector type.

Used by railroads, steamship lines and in stationary service.

Prices on application.

EXTRA HEAVY TUYERE COCKS
FOR BLAST FURNACES

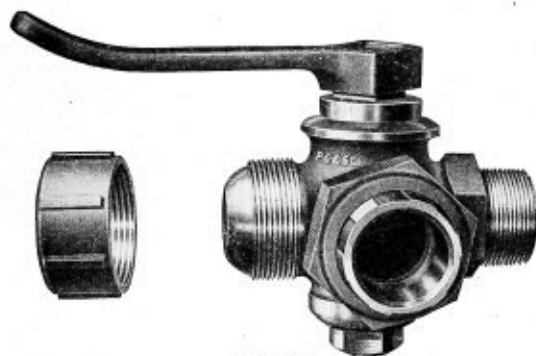


FIG. 450



FIG. 451

Our Blast Furnace Tuyere Cocks are meeting with a constantly increasing demand. They are made of the best quality of red brass. Extra heavy and suitable for severe service.

The ground-joint Union and the cap are interchangeable.

The lever is made of heavy malleable iron.

The threads can be made to correspond with fittings of any other, or old style, Tuyere Cocks.

Special Tuyere Cocks of any design, or pattern, furnished promptly.

HOMESTEAD BRASS STRAIGHTWAY VALVES

SCREWED AND FLANGED CONNECTIONS

FOR AIR, WATER, STEAM, GAS AND HYDRAULIC WORK

Description

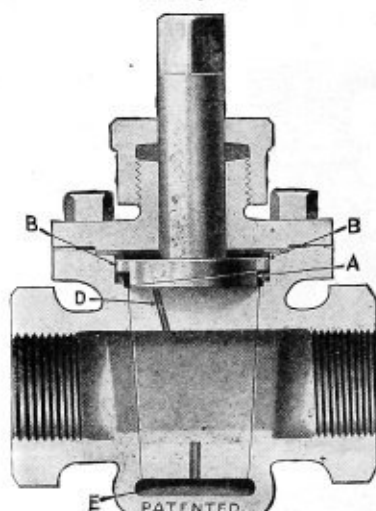


FIG. 452

all pressures up to 5,000 pounds per square inch. For steam, compressed air and hydraulic.

This valve is so constructed that when it is closed it is at the same time forced firmly to its seat. This result is secured by means of the traveling cam "A" through which the steam passes. The cam is prevented from turning with the stem by means of the lug "B" which move vertically in slots. Supposing the valve to be open, the cam will be in the lower part of the chamber in which it is placed, and the plug will be free to be easily moved. A quarter of a turn in the direction for closing it causes the cam to rise and take a bearing on the upper surface of the chamber, and the only effect of further effort to turn the stem in that direction is to force the plug more firmly to the seat. A slight motion in the other direction immediately releases the cam and the plug turns easily, being arrested at its proper open position by contact of the fingers of the cam at the other end of its travel. E D D are balancing ports which allow the pressure to predominate at the top of plug, holding it gently in its seat while valve is open. Made in all sizes up to 6 inches, and for



FIG. 453



FIG. 454

200 POUNDS WORKING PRESSURE

Size inches	1/8	1/4	3/8	1/2	3/4	1	1 1/8	1 1/2	2	2 1/2	3	4
Screwed . . . Price	\$3.83	3.83	4.00	4.50	5.37	7.17	9.60	13.40	23.30	35.00	60.40	120.40
" End to end . . .	2 1/8	2 1/8	2 1/8	2 3/8	3 1/4	3 3/8	4 1/4	4 1/2	6 1/2	6 1/2	8 1/2	11 1/4
Flanged . . . Price						16.66	19.20	26.70	35.00	46.40	82.90	136.00
" Face to Face . . .						6 1/8	5 7/8	6 1/4	7 3/8	8	9 1/2	12 1/4
" Diam. of Flgs. . . .						3 3/8	4 1/2	5	6	7	7 1/2	9
Extra for Drilling									.15	.25	.40	.75

HOMESTEAD BRASS STRAIGHTWAY VALVES CONTINUED

SCREWED AND FLANGED CONNECTIONS



FIG. 455



FIG. 456

500 POUNDS WORKING PRESSURE

Size	inches	1½	2	2½	3	4	5	6
Screwed	Price	\$5.00	5.00	5.00	7.30	9.16	11.70	16.60
Screwed, End to End.....	Price	2½	2½	2½	2½	3½	4½	4½
Flanged	Price						23.30	25.00
Flanged, Face to Face.....							4½	5¼
Flanged, Diameter of Flanges.....							4½	5
Extra for Drilling								

Size	inches	1½	2	2½	3	4	5	6
Screwed	Price	\$21.30	31.60	50.00	95.30	160.23	183.33	233.30
Screwed, End to End.....	Price	5½	6½	7½	10½	11½	12½	16¼
Flanged	Price	29.00	45.00	70.00	116.60	193.30	226.60	238.10
Flanged, Face to Face.....		6¼	8½	9½	11	12½	14½	16¼
Flanged, Diameter of Flanges.....		6	6½	7½	8¼	10	11	12½
Extra for Drilling			.15	.25	.40	.65	.75	1.00

1500 POUNDS WORKING PRESSURE

Size	inches	¾	1¼	¾	1½	¾	1	1¼	1½	2	2½	3
Screwed	Price	\$6.40	6.40	10.60	15.60	24.20	31.30	41.90	44.50	80.00	126.60	200.00
" End to End.....	Price	3¼	3¼	3¼	5¼	6	7	7½	7½	9½	10	10
Flanged	Price					31.87	44.90	58.60	66.60	133.90	191.76	244.77
" Face to Face.....						7	7½	8	8½	9½	11	
" Diam. of Flgs.....						4	4½	5	6	7	7½	
Extra for Drilling									.15	.25	.40	.65

3000 POUNDS WORKING PRESSURE

Size	inches	¾	1½	¾	1	1¼	1½	2	2½	3
Screwed	Price	\$15.96	29.76	38.26	53.13	63.76	73.13	116.86	170.00	
Flanged	Price			48.90	59.50	82.86	138.13	217.83		
Screwed, End to End.....	Price	5¼	6	7	8½	9½	10½	12		
Flanged, Face to Face....		6	7	8	8½	11	11			

5000 POUNDS WORKING PRESSURE

Size	inches	¾	¾	1½	¾	1	1¼	1½	2	2½
Screwed	Price	\$17.00	23.36	38.26	51.00	63.76	89.26	165.76	255.00	340.00
Flanged	Price					80.76	137.10	225.26	297.50	
Screwed, End to End.....	Price	5¼	6½	6½	10½	7½	9½	10	11	

These prices are for valves complete including malleable iron wrench.

HOMESTEAD STRAIGHTWAY VALVES

SEMI-STEEL BODY BRASS PLUG
SCREWED AND FLANGED CONNECTIONS

FIG. 457



FIG. 458

200 POUNDS WORKING PRESSURE

Size	inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	5	6
Screwed	Price	\$10.22	10.22	12.80	16.66	24.00	35.55	62.22	97.82	137.82	151.15
" Dist. End to End			$4\frac{1}{8}$	$4\frac{3}{8}$	5	$6\frac{1}{2}$	$7\frac{1}{4}$	10	$12\frac{1}{2}$	$12\frac{1}{2}$	$17\frac{1}{2}$
Flanged	Price		12.22	15.55	20.00	31.69	47.55	82.22	120.00	166.66	217.77
" Face to Face			$4\frac{7}{8}$	$5\frac{1}{4}$	$6\frac{1}{2}$	$8\frac{1}{4}$	$9\frac{3}{8}$	11	$12\frac{1}{2}$	14	16
" Diam. of Fl'ges.			$4\frac{1}{2}$	5	6	$6\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{4}$	10	$11\frac{1}{4}$	$12\frac{1}{2}$
Extra for Drilling						.25	.35	.60	1.00	1.25	1.50

HOMESTEAD STRAIGHTWAY VALVES

ALL SEMI-STEEL
SCREWED AND FLANGED CONNECTIONS

FIG. 459



FIG. 460

200 POUNDS WORKING PRESSURE

Size	inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	5	6
Screwed	Price	\$10.66	10.66	14.67	16.00	21.92	36.00	60.00	88.00	124.00	172.00
" Dist. End to End			$4\frac{1}{8}$	$4\frac{3}{8}$	5	$6\frac{1}{2}$	$7\frac{1}{4}$	$10\frac{1}{2}$	$11\frac{1}{4}$	$12\frac{1}{2}$	$16\frac{1}{4}$
Flanged	Price		14.67	16.00	21.33	28.53	46.83	78.03	108.00	150.03	196.00
" Face to Face			$4\frac{7}{8}$	$5\frac{1}{4}$	$6\frac{3}{4}$	$8\frac{1}{4}$	$9\frac{3}{8}$	$11\frac{3}{8}$	$12\frac{1}{2}$	$14\frac{3}{8}$	$16\frac{1}{4}$
" Diam. of Fl'ges.			$4\frac{1}{2}$	5	6	$6\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{4}$	10	$11\frac{1}{4}$	$12\frac{1}{2}$
" Extra for Drill'g						.25	.35	.60	1.00	1.25	1.50

HOMESTEAD THREE-WAY BRASS VALVES SCREWED AND FLANGED CONNECTIONS



FIG. 461



FIG. 462

200 POUNDS WORKING PRESSURE

Size ..inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	6
Screwed ends.....Price	\$6.34	6.67	9.90	15.80	19.30	22.90	36.60	60.80	93.30	160.00	282.00
" End to end of run.	$2\frac{1}{2}$	3	$3\frac{1}{8}$	$4\frac{1}{8}$	$4\frac{5}{8}$	$5\frac{1}{8}$	$6\frac{1}{8}$	$9\frac{1}{8}$	10	.....	$15\frac{1}{2}$
" Center of run to end of side opening....	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{1}{4}$	$2\frac{3}{4}$	$2\frac{1}{2}$	$3\frac{3}{4}$	$4\frac{1}{4}$	$5\frac{1}{4}$	.....	$7\frac{3}{4}$
Flanged ends.....Price	.....	.....	.....	.....	.....	33.20	50.00	80.80	99.86	180.00	388.00
" Face to face of run.	.....	.....	.....	.....	.....	$6\frac{5}{8}$	$7\frac{1}{2}$	$9\frac{1}{8}$	11	13	$15\frac{1}{2}$
" Diameter of flanges	.....	.....	.....	.....	.....	5	6	7	$7\frac{1}{2}$	9	11
" Center of run to face of side opening....	.....	.....	.....	.....	.....	$3\frac{1}{8}$	$3\frac{3}{4}$	$4\frac{1}{2}$	$5\frac{3}{8}$	$6\frac{1}{2}$	$7\frac{3}{4}$
Extra for Drilling, net....	.....	.....	.....	.....	.....	.15	.25	.40	.65	.75	1.25

600 POUNDS WORKING PRESSURE

Size ..inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	5	6
Screwed—Price	\$10.00	12.20	20.00	24.23	31.26	36.03	47.83	71.73	119.56	208.26	233.76	340.00
Screwed—End to end run		$3\frac{1}{4}$	$4\frac{1}{4}$	$4\frac{1}{2}$	$5\frac{1}{4}$	6	9	9	$9\frac{3}{4}$	$12\frac{1}{4}$	$16\frac{1}{4}$	$16\frac{1}{2}$
Screwed—Center of run to end of side opening		$1\frac{1}{2}$	$2\frac{1}{4}$	$2\frac{3}{4}$	$3\frac{1}{4}$	$3\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	5	$6\frac{1}{4}$	$8\frac{3}{4}$	$8\frac{3}{4}$
Flanged—Price						46.77	68.00	102.00	148.76	255.06	318.76	446.26
Flanged—Face to face of run.						$6\frac{5}{8}$	8	10	$10\frac{3}{4}$	$14\frac{1}{2}$	16	$16\frac{1}{2}$
Flanged—Diameter of flanges						6	$6\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{4}$	10	11	$12\frac{1}{2}$
Extra for Drilling, net....						.15	.25	.40	.65	.75	1.00	1.25

1500 POUNDS WORKING PRESSURE

Size ..inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Screwed—Price	\$25.50	34.00	38.26	53.13	68.00	110.50	174.26
Screwed—Dist. end to end.....	$5\frac{1}{4}$	6	$5\frac{3}{4}$	$9\frac{1}{8}$	$10\frac{1}{4}$	$12\frac{1}{4}$	.....

3000 POUNDS WORKING PRESSURE

Size ..inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Screwed—Price	\$38.00	50.00	60.00	72.26	121.13	210.80	.....
Screwed—Dist. end to end.....	$5\frac{1}{4}$	6	$6\frac{5}{8}$	9	$10\frac{3}{8}$	$12\frac{1}{4}$	.....

These prices are for valves complete including malleable iron wrench.

HOMESTEAD THREE-WAY VALVES—CONTINUED
SEMI-STEEL BODY, BRASS PLUG
SCREWED AND FLANGED CONNECTIONS



FIG. 463



FIG. 464

200 POUNDS WORKING PRESSURE

Size .....inches	1	1½	1½	2	2½	3	4	5	6
Screwed ends—Price	\$19.86	23.33	26.66	40.00	55.55	75.55	137.77	177.77	244.44
End to end run.....	4½	5½	6	9	9	10	14½	16½	16½
Cent. of run to end of side opening	2½	3½	3½	4½	4½	5½	7	8½	8½
Flanged—Price			34.66	52.26	75.60	100.05	155.55	200.00	271.15
Flanged—Face to face.....			6½	8½	10	10½	14½	16	16½
Center of run to face of side opening									
Extra for Drilling, net.....				.35	.60	1.00	1.25	1.50	2.00

These prices are for valves complete including malleable iron wrench.



FIG. 465

**HOMESTEAD
THREE-WAY
VALVES**

ALL SEMI-STEEL
SCREWED AND FLANGED
CONNECTIONS

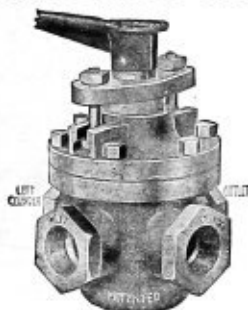


FIG. 466

Size .....inches	1	1½	1½	2	2½	3	4	5	6
Screwed—Price	\$21.33	26.66	29.33	40.00	57.33	75.63	144.00	186.66	220.00
Screwed—End to end of run	4½	5½	6	9	9	10	14½	16½	16½
Screwed—Center of run to end of side opening...	2½	3½	3½	4½	4½	5½	7	8½	8½
Flanged—Price	\$		34.66	52.26	75.60	100.05	155.55	200.00	271.15
Flanged—Face to face of run			6½	8	10	10½	14½	16	16½
Extra for Drilling, net.....				.35	.60	1.00	1.25	1.50	2.00

These prices are for valves complete including malleable iron wrench.

HOMESTEAD FOUR-WAY BRASS VALVES SCREWED AND FLANGED CONNECTIONS

**FIG. 467**

600 POUNDS WORKING PRESSURE

Size	inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Screwed—Price		\$12.77	20.10	25.10	45.10	51.00	64.60	90.90	122.10	180.60
Flanged—Price					80.76	95.63	123.26	169.20		
Dist. end to end, Screwed										
Con.			$4\frac{1}{4}$	5	$5\frac{5}{8}$	$6\frac{1}{2}$	$7\frac{1}{4}$	$9\frac{1}{4}$	$11\frac{1}{4}$	$11\frac{3}{4}$

FOUR-WAY VALVES FOR 1500 POUNDS PRESSURE

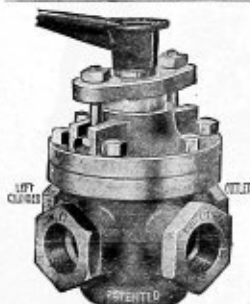
Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price		\$31.88	44.63	63.36	72.26	90.86	140.26	199.76
Dist. end to end		5	$5\frac{5}{8}$	$6\frac{3}{8}$	$7\frac{3}{8}$	$9\frac{1}{8}$	$11\frac{3}{8}$	$11\frac{7}{8}$

FOUR-WAY VALVES FOR 3000 POUNDS PRESSURE

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price		\$46.72	59.52	70.08	95.66	127.56	233.60	
Dist. end to end		6	$6\frac{5}{8}$	$7\frac{3}{8}$	$9\frac{1}{8}$	$11\frac{1}{8}$	$11\frac{3}{4}$	

FOUR-WAY VALVES FOR 200 POUNDS PRESSURE

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$
Price		\$16.00	20.00

**FIG. 468**

HOMESTEAD FOUR-WAY VALVES SEMI-STEEL, BRASS PLUG SCREWED CONNECTIONS

200 POUNDS WORKING PRESSURE

Size	inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Screwed—Price		\$26.27	47.15	48.88	66.66	88.88	127.69	177.77
Screwed—Dist. end to end			$5\frac{5}{8}$	$6\frac{1}{2}$	$7\frac{1}{4}$	$9\frac{1}{4}$	$11\frac{1}{4}$	$11\frac{3}{4}$

These prices are for valves complete including malleable iron wrench.

SEMI-STEEL

Size	inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Screwed—Price		\$23.68	42.35	48.00	60.80	77.33	114.93	160.00
Screwed—Dist. end to end of run			6	$6\frac{1}{2}$	$7\frac{1}{4}$	$9\frac{1}{4}$	$11\frac{1}{4}$	$11\frac{3}{4}$

These prices are for valves complete including malleable iron wrench.

SAFETY VALVES

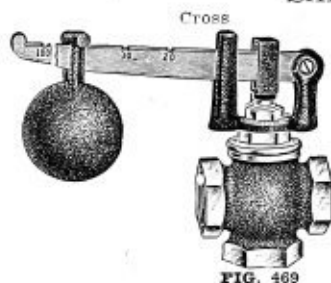


FIG. 469

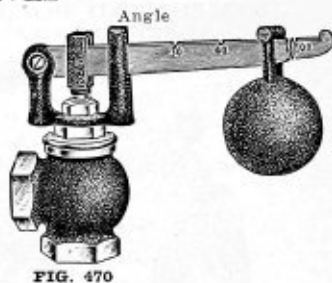


FIG. 470

BRASS CROSS AND ANGLE SAFETY VALVES—BRASS DISC

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Cross	each	\$2.20	2.50	3.25	3.90	4.70	7.15	9.00	12.50	22.50	33.50
Price, Angle	each			3.25	3.90	4.70	7.15	9.00	12.50		

IRON BODY CROSS SAFETY VALVES—BRASS DISC

Size	inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Price, Screwed	each	\$ 5.00	5.80	7.80	13.25	17.25	23.00
Size	inches	4	$4\frac{1}{2}$	5	6	7	8
Price, Screwed	each	\$28.75	34.50	41.50	57.75	93.50	132.00
Price, Flanged	each	34.00		48.00	65.00	100.00	140.00
Diameter of Flanges	inches	9		10	11	$12\frac{1}{2}$	$13\frac{1}{2}$
Face to Face	inches	$11\frac{1}{2}$		13	14	16	17

LOW PRESSURE BRASS POP SAFETY VALVES

FOR STEAM HEATING BOILERS

SET AT ANY PRESSURE SPECIFIED UP TO 20 POUNDS

No. 1160



FIG. 471

These Valves are made of brass, and are fitted with best steel springs.

In addition to their extensive use on steam heating boilers they are also useful on boiling kettles, tanks, etc.

When not otherwise specified we will furnish No. 1160 rough body valves set at 10 pounds.

In localities where Boiler Inspector Seal is required and so specified, we will furnish these Valves with lug cast on body and corresponding holes drilled through this lug and the hexagon corners of cap, for attaching wire and seal.

No. 1162



FIG. 472

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
No. 1160, Rough Body	each	\$5.25	5.25	6.00	6.75	8.25	11.25	26.00	37.50
No. 1162, Finished	each	6.00	6.00	6.75	7.75	9.50	13.00	28.00	41.00
No. 1164, Finished and Nickel Plated	each	6.75	6.75	7.50	8.75	10.50	14.00	30.00	44.00

The outlet holes on all sizes of these Valves are located to blow "downward."

STANDARD BRASS POP SAFETY VALVES

No. 1144



FIG. 473

No. 1148



FIG. 474

FOR STATIONARY BOILERS

SET AT ANY PRESSURE SPECIFIED UP TO 250 POUNDS

When ordering, always specify style number and state the pressure at which valves are wanted set to blow off.

The 2 1/4-inch valve has regular 2 1/2-inch pipe connections.

These valves will be made with female base or flanged connections when so ordered, at an extra price.

Size Inches	No. 1144 Price Each	No. 1148 Price Each	For Boilers Nominal H. P.	Valve Area Square Inches
1/2	\$11.00	\$ 8.00	6	0.196
3/4	11.00	8.00	6	0.441
1	13.00	10.00	10	0.785
1 1/4	16.00	12.00	20	1.227
1 1/2	19.00	15.00	30	1.767
2	29.00	23.00	40	3.141
2 1/4	38.00	31.00	55	3.976
2 1/2	46.00	38.00	70	4.908

STANDARD IRON BODY POP SAFETY VALVES

No. 1101

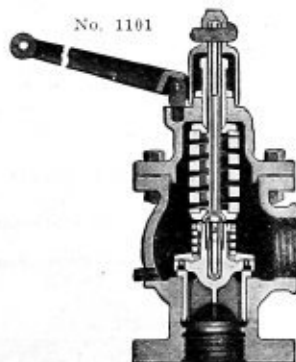


FIG. 475

FOR STATIONARY BOILERS

SET AT ANY PRESSURE SPECIFIED UP TO 250 POUNDS

When ordering, always state the pressure at which valves are wanted set to blow off.

These valves are made with combination flanged and screwed base. Hexagon screwed base furnished, when so ordered, at same price.

An additional charge will be made for special diameter flanges.

No. 1101 Valves furnished locked up at 50 cents each net extra.

In localities where boiler inspector seal is required, and so specified, we drill an extra hole in the stem pin at top of valve, for attaching the wire and seal. This at no extra charge.

Size Inches	PRICE		Diameter of Base Flange Inches	Diameter of Outlet Flange Inches	Center of Outlet to Bottom of Base Flange Inches	Center of Valve to End of Outlet Inches	Total Height Inches	For Boilers Nominal H. P.
	With Brass Seat Each	With Nickel Seat Each						
2 1/2	\$ 42.00	\$ 48.00	7 1/2	5 1/2	5 1/2	3 3/8	16 1/2	70
3	50.00	57.00	8 1/2	5 1/2	5 1/2	4 1/4	17 3/4	100
3 1/2	68.00	75.00	9	6 1/2	6 1/2	4 5/8	20 3/4	125
4	75.00	87.00	10	6 1/2	6 1/2	5	21 1/4	150
4 1/2	100.00	115.00	10 1/2	7 1/8	7 1/8	6	22 5/8	175

These valves
made with
hexagon
screw base
when
ordered.

Screw Outlet

IRON BODY POP SAFETY VALVES TWIN PATTERN FOR STATIONARY BOILERS

These Valves conform with the requirements of the A. S. M. E. Boiler Code. Set at any pressure specified up to 250 pounds. Brass or Monel Metal Seats.



FIG. 476

No. 1103 comprises two No. 1101 Plain Spring Valves mounted on Y Base.

No. 1107 comprises two No. 1105 Encased Spring Valves, locked up, mounted on Y Base.

When ordering, always specify the style number and state the pressure at which valves are wanted set to blow off.

When not otherwise specified, No. 1107 Twin Type with brass seats will be furnished.

Prices include two Valves and corresponding Y Base all bolted together as shown in cuts.

No. 1107 Valves can be furnished with Flanged Outlets, when so ordered, at a special price.



FIG. 477

PRICE LIST TWIN PATTERN

Size Inches	No. 1103		No. 1107	
	With Brass Seat Each	With Monel Metal Seat Each	With Brass Seat Each	With Monel Metal Seat Each
2½	\$118.00	130.00	148.00	160.00
3	142.00	156.00	178.00	192.00
3½	186.00	200.00	226.00	240.00
4	210.00	234.00	256.00	280.00
4½	290.00	320.00	340.00	370.00

OUTSIDE SPRING AND YOKE POP SAFETY VALVES

Will fulfill all Safety Valve requirements of Stationary and Marine Boiler Rules.

Cast iron body and yoke. Brass or Monel Metal Seat. Set to any pressure up to 250 pounds.

NO. 1117 FLANGED OUTLET NO. 1116 SCREWED OUTLET

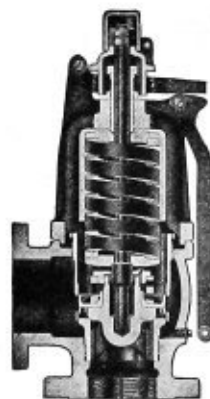


FIG. 478

Size	2½	3	3½	4	4½
No. 1116 & No. 1117— Brass seat.....each	\$120.00	135.00	160.00	170.00	225.00
No. 1116 & No. 1117— Monel Metal Seat each	126.00	142.00	167.00	182.00	240.00

When ordering, always specify the style number of valve and state the pressure valves are wanted set to blow off, also whether brass or monel metal seat.

Valves with brass seat will always be furnished unless monel metal seat is specified. These valves are furnished locked up.

When so desired guards for the spring can be furnished giving the yoke the appearance of an ordinary bonnet. An extra charge will be made for these guards.

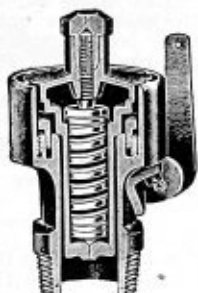
KUNKLE LOCK-UP BRASS POP SAFETY VALVESDirect Outlet for Portable and
Stationary Boilers

FIG. 479

Side Outlet for Stationary and
Marine Boilers

FIG. 480

Size.....inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
For boilers.....horse-power	2 to 5	2 to 5	5 to 10	10 to 15	15 to 20	20 to 35	35 to 60
Price, direct outlet.....each	\$9.00	\$9.00	\$10.00	\$12.00	\$15.00	\$25.00	\$35.00
Price, side outlet.....each	10.00	10.00	12.00	14.00	17.00	28.00	40.00

Size.....inches	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6
For boilers.....horse-power	60 to 90	90 to 120	120 to 160	160 to 180	180 to 210	210 & Up
Price, direct outlet.....each	\$50.00	\$70.00	\$90.00	\$110.00	\$140.00	\$180.00
Price, side outlet.....each	56.00	78.00	100.00	125.00	160.00	200.00

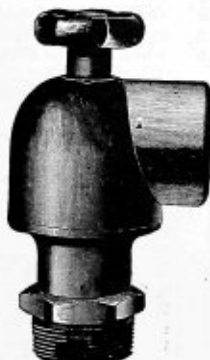
KUNKLE LOCK-UP BRASS WATER RELIEF VALVE

FIG. 481

Size of Valve	Price for Valve with Direct Outlet	Price for Valve with Side Outlet	Price for Valve with Side Outlet and Flanged Base Cast on Base of Valve	Diameter of Flange
$\frac{3}{4}$ -inch	\$9.00	\$10.00	.....	.....
1 -inch	10.00	12.00	.....	.....
$1\frac{1}{4}$ -inch	12.00	14.00	.....	.....
$1\frac{1}{2}$ -inch	15.00	17.00	.....	.....
2 -inch	25.00	28.00	\$31.00	6-inch
$2\frac{1}{2}$ -inch	35.00	40.00	45.00	7-inch
3 -inch	50.00	56.00	63.00	8-inch
$3\frac{1}{2}$ -inch	70.00	78.00	88.00	9-inch
4 -inch	90.00	100.00	110.00	10-inch
$4\frac{1}{2}$ -inch	110.00	125.00	140.00	11-inch
5 -inch	140.00	160.00	180.00	12-inch
6 -inch	180.00	200.00	220.00	13-inch

In ordering valves, please state the highest pressure the valve is to work under.

BRASS, WATER AND CYLINDER RELIEF VALVES

No. 1126



FIG. 482

No. 1126 is intended for use as a Water Relief Valve. Sizes $2\frac{1}{2}$ inch and smaller will be set at any pressure specified from 10 to 250 pounds and sizes 3 inch, $3\frac{1}{2}$ inches and 4 inch will be set at any pressure specified from 10 to 200 pounds.

The No. 1126 while regularly made with a hand wheel for quick adjustment, can also be furnished for wrench adjustment with a screwed cap for the protection of the adjusting screw, when so ordered. Locks are furnished when ordered at an extra price. When boiler inspector's seal is required, suitable holes are drilled for attaching wire and seal in place of lock and pin.

When ordering, always specify the style number and state the pressure at which valves are wanted set to relieve.

These valves will be furnished with male base up to and including $2\frac{1}{2}$ inch and with female base sizes 3 to 4 inch, inclusive. When required otherwise or flanged they will be furnished at a special price.

Size inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price, finished...each	\$11.00	11.00	13.00	16.00	19.00	29.00	46.00	77.00	105.00	135.00
Price, nick. pl'd, each.	12.00	12.00	14.00	18.00	22.00	32.00	50.00	85.00	115.00	150.00

IRON BODY WATER RELIEF VALVES FOR PUMPS, STAND PIPES, PIPE LINES, CYLINDERS, ETC. SET AT ANY PRESSURE SPECIFIED FROM 10 TO 250 POUNDS

No. 1123



FIG. 483

To change set pressures: Turn wheel to the left (up) to decrease pressure. Turn wheel to the right (down) to increase pressure.

Unless otherwise specified, Valves with Hand Wheel will always be furnished.

These Valves are made with combination flanged and screwed base. Hexagon screwed base furnished, when so ordered, at same price.

Base or outlet flanges will be made to suit any diameter or thickness required, at an additional price.

When Valves larger than 6 inch are required, we recommend using smaller Valves to equal as nearly as possible the corresponding capacity of the large Valve. For instance, in place of one 8 inch, use two 6 inch Valves, the combined capacity of which would be slightly in excess of one 8 inch.

When Valves are wanted for higher pressures than 250 pounds, prices will be quoted on application.

When these Valves are wanted for hot water service the order should so specify.

Letters and arrow are cast on wrench nut as shown.



FIG. 484

When wanted for wrench adjustment the square stem nut, as shown above, will be used in place of hand-wheel on this style Valves.

Size Inches	Price, with Brass Seat Each	Diameter of Base Flange Inches	Diameter of Outlet Flange Inches	Center of Outlet to Bottom of Base Flange Inches	Center of Valve to End of Outlet Inches	Total Height Inches
$2\frac{1}{2}$	\$42.00	$7\frac{1}{2}$	$8\frac{1}{4}$	$5\frac{1}{4}$	$3\frac{7}{8}$	17 $\frac{1}{8}$
3	50.00	$8\frac{1}{4}$	$9\frac{1}{4}$	$5\frac{3}{4}$	$4\frac{1}{4}$	18 $\frac{1}{8}$
$3\frac{1}{2}$	68.00	9	$10\frac{1}{4}$	$6\frac{1}{4}$	$4\frac{3}{4}$	20 $\frac{1}{8}$
4	75.00	10	$11\frac{1}{4}$	$6\frac{3}{4}$	5	21
$4\frac{1}{2}$	100.00	$10\frac{1}{2}$	$12\frac{1}{4}$	$7\frac{1}{4}$	6	22 $\frac{1}{2}$
5	120.00	11	$13\frac{1}{4}$	$7\frac{3}{4}$	$7\frac{1}{4}$	23 $\frac{1}{2}$
6	170.00	$12\frac{1}{2}$	14	$8\frac{1}{2}$	$8\frac{1}{4}$	25 $\frac{1}{2}$

These sizes made with screwed outlet unless otherwise specified.

Flang d/Screw d/Outlet

STANDARD IRON BODY BACK PRESSURE VALVES WEIGHTED FOR BACK PRESSURE UP TO FIVE POUNDS

Horizontal



FIG. 485

Vertical



FIG. 486

NO. 384 SCREWED—NO. 385 FLANGED

Size	inches	2	2½	3	3½	4	5
Price, Screwed	each	\$11.00	13.00	15.00	19.00	22.50	33.50
Size	inches	6	7	8	10	12	.....
Price, Screwed	each	\$43.00	70.00	85.00	120.00	180.00	.....
Price, Flanged	each	47.00	75.00	90.00	130.00	200.00	.....
Face to Face	inches	14	16	17	20	24	.....
Diameter of Flanges	inches	11	12½	13½	16	19	.....

The construction of these valves is such that the horizontal pattern can only be furnished in sizes 4 inch and larger.

NOISELESS IRON BODY BACK PRESSURE VALVES FOR NON-CONDENSING ENGINES ONLY

Horizontal



FIG. 487

Vertical

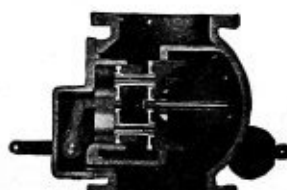


FIG. 488

Can Be Placed in Either Horizontal or Vertical Position by Changing the Position of Lever and Weight

NO. 416, SCREWED

Size	inches	2	2½	3	3½	4	4½	5	6	7	8	9
Price	each	\$14.00	16.00	18.00	22.00	25.00	30.00	40.00	60.00	80.00	100.00	120.00
End to End	inches	6½	7½	9	9¾	10½	11¼	12¾	13¾	14½	16¾	17¾

NO. 417, FLANGED

Size	inches	2	2½	3	3½	4	4½	5	6	7	8
Price	each	\$ 14.00	16.00	18.00	22.00	25.00	30.00	40.00	60.00	80.00	100.00
Diam. of Flanges	inches	6	7	7½	8½	9	9¼	10	11	12½	13½
Face to Face	in.	7½	9	9¾	10¾	11¼	12¾	13¾	14½	15½	16½
Size	inches	9	10	12	14	15	16	18	20	22	24
Price	each	\$120.00	145.00	220.00	345.00	400.00	465.00	600.00	750.00	900.00	1050.00
Diam. of Flanges	inches	15	16	19	21	22¼	23¾	25	27¼	29½	32
Face to Face	in.	18½	20½	24¼	26¾	26¾	28¼	31¼	33¼	44¾	44¾

COMBINATION BACK PRESSURE AND EXHAUST RELIEF VALVES

FOR CONDENSING OR NON-CONDENSING ENGINES

No. 415H Horizontal

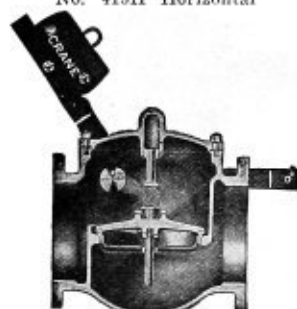


FIG. 489

IRON BODY

BRASS MOUNTED

These Valves are provided with outside dash-pot to cushion the discs and prevent pounding or hammering and are so constructed that foreign matter can not collect and interfere with their operation.

The lever weights are arranged so that the Valves may be used as ATMOSPHERIC EXHAUST RELIEF VALVES for condensing engines or as BACK PRESSURE VALVES for non-condensing engines.

Sizes 16 inch and larger have double levers and weights.

EXHAUST RELIEF VALVES FOR CONDENSING ENGINES

When used as ATMOSPHERIC EXHAUST RELIEF VALVES for condensing engines, they remain closed while the vacuum is maintained in

the condenser, but should the vacuum be lost, the Valves will open automatically by reason of the pressure of the exhaust steam lifting the disc, permitting the engine to exhaust freely into the atmosphere and STAY OPEN UNTIL CLOSED BY HAND when the weight is located on the angle arm of the outside levers, as shown in cut above.

Means are provided for water sealing the Valve seat.

BACK PRESSURE VALVES FOR NON-CONDENSING ENGINES

When arranged as BACK PRESSURE VALVES for use with non-condensing engines, the weight is bolted to the horizontal arm of the lever. They may be weighted for a maximum Back Pressure of five pounds.

These Valves are also recommended for use on Vacuum Heating Systems.

No. 415H Horizontal No. 415V Vertical No. 415A Angle Special Down Discharge



FIG. 490



FIG. 491



FIG. 492



FIG. 493

HORIZONTAL, VERTICAL AND ANGLE VALVES

NO. 414 SCREWED

Size, inches....	4	4½	5	6	7	8	9	10	12
Price, each	\$64.00	72.00	88.00	120.00	175.00	155.00	260.00	310.00	385.00

NO. 415 FLANGED

Size, inches....	4	4½	5	6	7	8	9	10	12
Price, each	\$64.00	72.00	88.00	120.00	175.00	195.00	260.00	310.00	385.00

Size, inches....	14	15	16	18	20	22	24	30	36
Price, each	\$475.00	525.00	575.00	675.00	775.00	1,050.00	1,350.00	2,100.00	3,000.00

The 15 inch is made only in the horizontal and vertical patterns.

Sizes 7 inch and smaller have internal Dash Pots.

Sizes 8 inch and larger have external Dash Pots.

The above prices do not apply to the Special Down Discharge Valves, which are made to order only in sizes 12 inch and larger, at a special price.

Sizes 16 inch and larger have double levers.

R-K COMBINATION BACK PRESSURE AND ATMOSPHERIC RELIEF VALVE

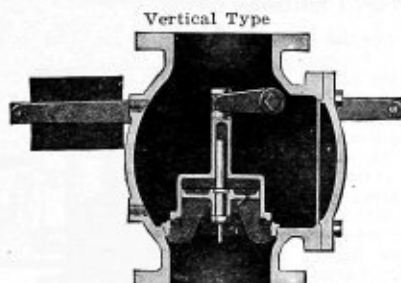


FIG. 494

The R-K combination valve is designed for the purpose of having one valve which would work equally as well on either a condensing or non-condensing plant. The material of which these valves are made is of the very best quality. The bodies are made of close grained cast-iron, face of valve disc and seat ring are of bronze composition metal. The piston of the dash-pot is supported by webs cast solid to the seat ring, and centrally guides the valve disc to the seat. Provision is made for retaining a water seal over the disc to prevent leakage of air when valve is used on

condensing service. This valve can immediately be changed from a back pressure to a relief valve by simply transferring the sliding weight from the long arm to the short arm of the lever. When ordering state pressure to be carried.

Size	4	5	6	7	8	10	12	14	16	18	20	22	24
List Price	\$38	51	69	101	112	180	222	274	332	390	500	675	800

Special and larger sizes on request.

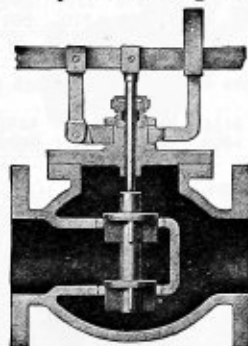


FIG. 495

R-K BALANCED VALVE

The R-K Balanced Valve is used to control the flow of steam, air, gas, water or other fluids, and can be operated in connection with a float, or other mechanical means of operation. This valve is made with double poppet seats, insuring tightness of the seats, or, with piston type of seats.

The valves are made to work on pressures as high as 200 lbs. in both angle and globe type.

State the service when ordering.

Size of Valve	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3
Face to Face Std.	3 $\frac{3}{4}$	3 $\frac{3}{4}$	4 $\frac{3}{4}$	5 $\frac{3}{4}$	6 $\frac{1}{4}$	7 $\frac{1}{2}$	10	11
Face to Face, extra heavy	3 $\frac{3}{4}$	3 $\frac{3}{4}$	4 $\frac{3}{4}$	5 $\frac{3}{4}$	6 $\frac{1}{4}$	7 $\frac{1}{2}$	11	12
Cen. to ex. top.	5 $\frac{1}{4}$	5 $\frac{1}{4}$	5 $\frac{3}{4}$	6	6 $\frac{3}{4}$	7 $\frac{1}{2}$	9 $\frac{1}{4}$	9 $\frac{1}{2}$
Cen. to ex. bot.	1 $\frac{3}{4}$	1 $\frac{3}{4}$	2 $\frac{1}{4}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	4
Shipping Weight	15	15	20	25	35	50	75	85
List Price	\$9.50	9.50	11.50	13.20	15.60	20.00	27.50	35.50
Size of Valve	3 $\frac{1}{2}$	4	5	6	8	10	12	.....
Face to Face Std.	12	13	15	16	18	22	24	.....
Face to Face, extra heavy	13	14	16	17	20	23	26	.....
Cen. to ex. top.	11	12 $\frac{1}{2}$	14	15 $\frac{1}{2}$	18 $\frac{3}{4}$	21	23	.....
Cen. to ex. bot.	4 $\frac{1}{4}$	4 $\frac{1}{2}$	5 $\frac{3}{4}$	6	7 $\frac{1}{2}$	9	11	.....
Shipping Weight	110	125	175	200	300	500	725	.....
List Price	\$42	50	64	80	108	180	260	.....

The above prices apply to valves for 125 lbs. pressure; for extra heavy valves add 15% to list prices. Floats can be furnished, at extra cost, when required.

K. & T. PATENTED NOISELESS BACK PRESSURE VALVE

FOR NON-CONDENSING ENGINES ONLY



FIG. 496

For service on the exhaust line of a non-condensing engine to maintain a back pressure where exhaust steam is used for heating purpose. It is durable, sensitive and noiseless and may be installed in horizontal or vertical position.

Standard valves are for a range of from 2 to 6 lbs. back pressure and when wanted for a lower or higher back pressure or for vacuum system will be furnished accordingly when so ordered.

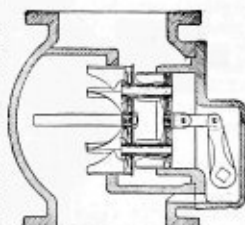


FIG. 497

In ordering state the range of pressures for which valve is wanted also whether valve will be installed in horizontal or vertical position.

Size.....Inches	2	2½	3	3½	4	4½	5	6	7	8
Price.....each	\$14.00	16.00	18.00	22.00	25.00	30.00	40.00	60.00	80.00	100.00
Face to face, screwed.....	6½	7½	9	9¾	10½	11¼	12¾	13¾	14½	16½
Face to face, flanged.....	7½	9	9½	10½	11¼	12¾	13¾	14¾	15½	16½
App. shipping weight.....	3½	4½	5½	70	85	105	130	165	210	260
Size.....inches	9	10	12	14	15	16	18	20	22	24
Price.....each	120.00	145.00	220.00	345.00	400.00	465.00	600.00	750.00	900.00	1050.00
F.to F., screw'd.....	17¾									
F.to F., flanged.....	18¾	20¾	24¼	26¾	26¾	28¾	31¼	33¼	44¾	44¾
App. shpg. wt.....	350	460	610	850	925	1050	1400	1600	2100	2600

K. & T. AUTO. EXHAUST RELIEF VALVES

FOR CONDENSING ENGINES ONLY

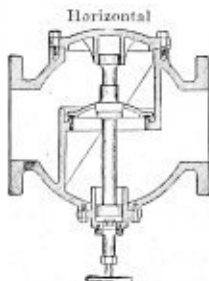


FIG. 498

For service on the exhaust line of condensing engine to automatically relieve any pressure formed due to loss of vacuum. It is sensitive, reliable and noiseless in operation and has full area of pipe. Made with water seal, also has dashpot to cushion disc, so as to operate noiseless, and is provided with a hand wheel for permanently holding valve open. Angle valves made to order only. All valves have standard flanges.



FIG. 499

Size.....inches	6	7	8	10	12	14	16	18	20	22	24
Price.....each	100.00	150.00	170.00	270.00	335.00	415.00	500.00	584.00	670.00	917.00	1170.00
(H.L. or V.L.)											
Len. F. to F.	14½	15½	16½	20¾	24¼	26¾	28¾	31¼	33¼	44¾	44¾
App. shpg. wt.....	300	500	700	860	1125	1340	1750	2300	3000		

AUTOMATIC EXTRA HEAVY STOP-CHECK VALVES
FERROSTEEL BODY AND YOKE **STEEL STEM**
SEATS AND DISCS OF HARD METAL **RENEWABLE SEAT**
FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

No. 28 E Straight Y
 Used in Horizontal or Vertical Lines



FIG. 500



FIG. 501

No. 30 E Angle Y
 Used in Either Position



FIG. 502



FIG. 503

All steam plants having more than one boiler should have one of these combination Stop-Check Valves in the piping, between each boiler and the main steam line or header.

In the event of a tube blowing out, or the bursting of a joint in the boiler lead to which a Stop-Check Valve is connected, the valve will instantly and automatically close, cutting out the boiler, and acting as a non-return valve, prevent a back flow of steam from the main.

They also act as a Safety-Stop Valve, preventing any steam entering or backing into a closed boiler while men are at work inside.

Each Valve will open promptly and automatically when the boiler to which it is connected reaches the full pressure in the main, but will remain closed against a higher pressure in the main; consequently, a sluggish boiler may be readily detected, and the firing given proper attention.

They should be placed so that the boiler pressure comes underneath the disc.

Size	inches	2½	3	4	5	6	7	8	10
No. 28E, Straight Flanged, each		\$45.00	50.00	60.00	80.00	95.00	120.00	145.00	240.00
No. 30E, Angle Flanged, each		45.00	50.00	60.00	80.00	95.00	120.00	145.00	240.00

Screwed Valves 2½ to 6 inch will be furnished at the same price.

When ordering Stop-Check Valves it is good policy to give the horse power and working pressure of the boiler on which the Valve is to be used.

GUARANTEE—If properly installed these Valves are guaranteed against defects in design, workmanship or material, for a service period of one year. Should a defect develop attributable to any of the above causes, we will exchange the defective valve for a new one without charge.

CRANE EXTRA HEAVY EMERGENCY ENGINE STOP VALVE

FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

No. 46E.



FIG. 504

No. 46½E.



FIG. 505

This valve may be closed instantly in case of accident. It may be operated from one or several points outside the danger zone.

The metals and proportions are such as to safely withstand the shock of suddenly stopping the flow of steam.

The design is that of a Swing Check Valve with the flow against the back of the disc.

The disc is attached to a shaft which extends through a stuffing box to the outside of the valve. A lever is attached to the shaft, one end of which engages with the releasing device (hand or electrical), and a weight is attached to the other end of the lever to assist in closing the valve.

A by-pass is provided to equalize the steam pressure on both sides of the disc, when the valve is to be opened.

A drain is provided to take care of condensation.

The valve may be installed in a vertical or horizontal position, or at any angle, by adjusting the lever so the disc will open and close properly.

While the engine is running, the disc is held out of the path of the steam by the releasing device, operated either by a cord or electrical push button. When stopping the engine, the cord is released or the button pushed and the weight on the lever brings the disc into the path of the steam and it is closed instantly.

To reset the valve, the throttle valve must be closed. The by-pass on the Engine Stop Valve is then opened, and when the pressure is equalized on both sides of the disc, the lever may be raised and the valve reset. The by-pass valve should then be closed.

"Safety First" calls loudly for these valves, even where not required by law.

Size	Inches	3	4	5	6	7	8	10
Price, No. 46E Hand Release....	Each	\$90.00	100.00	120.00	145.00	175.00	210.00	260.00
Price, No. 46½E Electrical Release	Each	135.00	145.00	165.00	190.00	220.00	255.00	305.00
Face to Face.....	Inches	13½	14	15¼	17½	19¼	21	24½
Diameter of Flange.....	Inches	8¼	10	11	12½	14	15	17½

These prices include the releasing device mounted on the valve.

In ordering, specify whether for use in horizontal pipe or vertical pipe, upward or downward flow.

When made of cast steel with monel metal seats and discs, these valves are good for superheated steam up to 350 pounds working pressure and a total temperature of 800° Fahrenheit.

TEMPERATURE CONTROL VALVES

FOR SATURATED STEAM WORKING PRESSURES UP TO 250 POUNDS
AND A TOTAL TEMPERATURE OF 500 DEGREES FAHRENHEIT

BRASS BODIES AND CAPS

UNION ENDS

HARD METAL SEATS AND DISCS

Many industrial processes using steam for heat require control of the temperature in a vessel or compartment. In some processes the steam is not allowed to come in direct contact with the material being heated, the heat only of the steam being utilized. The temperature desired may be much lower than the temperature of the steam itself.

The need for a reliable, simplified device which will automatically maintain a desired temperature has been recognized for years. Effective temperature control means a saving in steam and accuracy in the process.

To be effective a device of this kind must be sensitive, because no great variation in temperature above or below that required for the process is allowable.

C. C.—S. C.



FIG. 506

The Crane Temperature Control Valve consists of a readily adjustable indicating thermometer-thermostat electrically connected with a solenoid operating a pilot valve mounted on and controlling the steam valve. The whole device is extremely sensitive and will operate within a variation of one degree. Power for the solenoid may be taken from any lamp socket and the current required to operate it (20 watts) is used only when the steam valve is closed.

Crane Temperature Control Valves may be used for a variety of purposes as the following list will show: Rubber Vulcanizing, Dry Kilns,

Pasteurizing, Drying Apparatus of all kinds, Laundry and Hotel Water Heaters, Cooking Apparatus of all kinds, Melting Wax, Lard, etc., Dye Kettles, Railroad Car Heating.

C. C.—B. C.

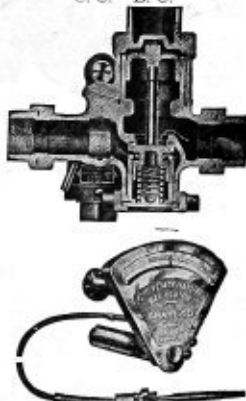


FIG. 507

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2
Price, C. C.—S. C.	each	\$251.00	256.00	261.00	276.00	296.00	346.00
Price, C. C.—B. C.	each	335.00	340.00	345.00	360.00	380.00	430.00

Prices include the Valve, C. C. Strainer and Thermostat, complete.

Type C. C.—S. C. Thermostat is used to control the temperature of a room or compartment and is self-contained.

Type C. C.—B. C. Thermostat is used to control the temperature where a bulb is necessary. Larger sizes, prices on application.

SCALES USED ON THERMOSTATS AND RECOMMENDED WORKING RANGES

Scale No. 12, C. C.—S. C.	Range, 70 to 140 degrees Fahr.
Scale No. 16, C. C.—B. C.	Range, 115 to 165 degrees Fahr.
Scale No. 2, C. C.—B. C.	Range, 165 to 215 degrees Fahr.
Scale No. 17, C. C.—B. C.	Range, 215 to 265 degrees Fahr.
Scale No. 13, C. C.—B. C.	Range, 265 to 315 degrees Fahr.
Scale No. 8, C. C.—B. C.	Range, 350 to 480 degrees Fahr.

Scale No. 12 is used on the C. C.—S. C. type only.

All other scales are used on C. C.—B. C. type only.

CRANE-ERWOOD AUTOMATIC DOUBLE ACTING NON-RETURN AND EMERGENCY CUT-OUT VALVES

EXTRA HEAVY FERROSTEEL BODY
HARD METAL SEATS AND DISCS
FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

No. 36 E. Horizontal



FIG. 508

No. 37 E. Vertical



FIG. 509

PRICE LIST FLANGED VALVES

Size	Inches	4	5	6	7	8	10
No. 36 E. Horizontal	Each	\$120.00	150.00	180.00	210.00	240.00	400.00
No. 37 E. Vertical.....	Each	120.00	150.00	180.00	210.00	240.00	400.00

Vertical type Valves are the same general design and dimensions as the horizontal, but differ as to the location and position of the outside operating parts. When ordering Vertical, be particular to specify Vertical No. 37 E, otherwise Horizontal No. 36E will always be furnished.

IRON BODY TRANSFER VALVES

FOR USE IN EXHAUST STEAM LINES

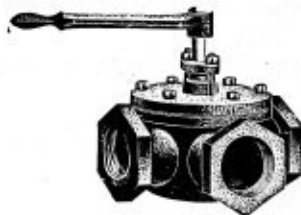


FIG. 510

Will take the place of two Gate Valves in turning exhaust either to heater or atmosphere.

Size	inches	1½	2	2½	3	4	5	6	7	8	10	12
Price, screw..Ea.	\$8.00	9.00	11.00	14.00	19.00	30.00	40.50	53.00	63.00	90.00	135.00	
Price, Fl'g'd..Ea.	.....	11.75	14.00	17.75	24.00	35.50	48.00	60.00	72.00	100.00	150.00	

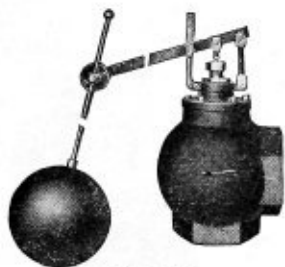


FIG. 511

K. & T. TANK FLOAT VALVES

For automatic control of water supply to tanks, etc. All valves have a swivel yoke and guide with adjustment to limit flow, also a perfectly balanced valve whereby its operation is not affected by pressure. Standard valves are furnished for cold water suitable for any working pressure up to 150 lbs. with low pressure seamless copper float. Valves for hot water made to order.

ANGLE OR GLOBE, WITH SEAMLESS COPPER FLOAT

Size	inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Price	each	\$11.00	\$13.00	\$14.00	\$16.00	\$19.00	\$25.00	\$31.00	\$36.00
Size float	inches	7	7	7	7	7	8	8	8
Face to face, screwed ..		$3\frac{3}{8}$	$4\frac{1}{8}$	$4\frac{1}{4}$	$4\frac{7}{8}$	$6\frac{7}{8}$	8	$9\frac{1}{8}$	$9\frac{7}{8}$
" " " flanged ..						$7\frac{1}{2}$	9	$9\frac{3}{4}$	$9\frac{3}{4}$
Center to face, screw'd ..		$1\frac{1}{8}$	$2\frac{1}{8}$	$2\frac{3}{8}$	$2\frac{7}{8}$	$3\frac{3}{8}$	4	$4\frac{3}{8}$	$4\frac{7}{8}$
" " " flanged ..						$4\frac{1}{8}$	$4\frac{3}{4}$	$5\frac{1}{4}$	$5\frac{1}{4}$
App. shipping weight	lbs.	16	17	18	25	50	60	76	95

Size	inches	4	$4\frac{1}{2}$	5	6	7	8	10	12
Price	each	\$42.00	50.00	54.00	64.00	76.00	86.00	110.00	150.00
Size float	inches	8	10	10	10	10	10	12	12
Face to face, screwed ..		$9\frac{7}{8}$	$11\frac{1}{4}$	$11\frac{3}{4}$	$12\frac{1}{4}$				
" " " flanged ..		$10\frac{5}{8}$	$10\frac{5}{8}$	$12\frac{1}{8}$	13	$14\frac{5}{8}$	$16\frac{1}{4}$	$20\frac{1}{4}$	$22\frac{5}{8}$
Center to face, screw'd ..		$4\frac{1}{8}$	$5\frac{5}{8}$	$5\frac{5}{8}$	$6\frac{1}{8}$				
" " " flanged ..		$6\frac{1}{8}$	$6\frac{1}{8}$	$6\frac{3}{8}$	$6\frac{7}{8}$	$7\frac{7}{8}$	$8\frac{3}{8}$	$10\frac{1}{4}$	$11\frac{7}{8}$
App. shipping weight	lbs.	130		140	185	200	260	450	525

K. & T. WATER LEVEL CONTROLLER

For automatic control of water level in closed tanks or feed water heaters, also to control steam pumps according to the accumulation of condensation in receiving tanks.

Attachments consist of float shaft, stuffing box with 1-inch standard pipe thread, levers, brass connection rod about 2 feet with adjustable turn-buckle, seamless copper low-pressure float and balanced lever controlling valve furnished for water or steam as ordered.

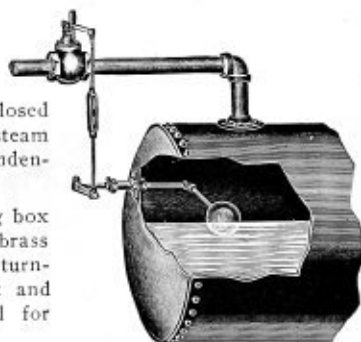


FIG. 512

Size	valve	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Controller with valve and float		\$32.50	\$35.00	\$37.50	\$40.00	\$45.00	\$50.00	\$55.00	\$60.00	\$70.00
Seamless float		7	7	7	7	8	8	8	8	10
Valve (only)		6.50	8.00	9.50	11.00	14.00	19.00	25.00	30.00	35.00

For face to face dimensions see float valves.

MASON REDUCING VALVES

Standard All Bronze



FIG. 513

Standard Iron Body



FIG. 514

The Mason Standard Reducing Valve reduces and maintains even pressure of steam or air regardless of the variation of the initial pressure or of the volume of steam or air required. It automatically reduces boiler pressure for steam heating systems of all types (vacuum systems included), central heating plants, engines, paper machines, slushers, dye kettles and all situations where it is desirable to use a lower pressure than that on the boiler.

BRONZE REDUCING VALVES—SCREWED

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Length over Unions	inches	5 $\frac{3}{4}$	5 $\frac{3}{4}$	7	8	9	11 $\frac{1}{4}$
Price	each	\$18.00	18.00	22.00	28.00	35.00	44.00

IRON BODY REDUCING VALVES—FLANGED

Size	inches	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4	5	6	8	10
Diameter of Flanges	inches	7 $\frac{1}{2}$	8 $\frac{1}{4}$	9	10	11	12 $\frac{1}{2}$	15	17 $\frac{1}{2}$
Price	each	\$57.00	72.00	85.00	100.00	135.00	180.00	250.00	350.00

DIFFERENTIAL REDUCING VALVES

Mason Differential Reducing Valves are designed for use on vacuum systems of steam heating and wherever a large volume of steam is required at a low pressure from a high initial pressure.

The outlet of these valves has an area four times that of the inlet, the main valve being the size of the inlet. They are fitted with large diaphragms and will reduce below the atmosphere and as high as 15 pounds to the square inch.

ALL BRONZE

Size	inches	$\frac{3}{4}$ x1 $\frac{1}{2}$	1x2	1 $\frac{1}{4}$ x2 $\frac{1}{2}$	1 $\frac{1}{2}$ x3	2x4
Price	each	\$26.00	\$32.00	\$39.00	48.00	\$61.00

IRON BODY—FLANGED INLET AND OUTLET

Size	inches	2 $\frac{1}{2}$ x5	3x6	3 $\frac{1}{2}$ x7	4x8	5x10
Price	each	\$76.00	\$89.00	104.00	\$139.00	\$185.00



FIG. 515

$\frac{3}{4}$ x1 $\frac{1}{2}$ -inch and 1x2-inch sizes have unions on both inlet and outlet; remaining sizes have unions on inlet and flanged outlet.

FISHER REDUCING VALVES

Regular Pattern

Increased Outlet Type

Piston Type



FIG. 516

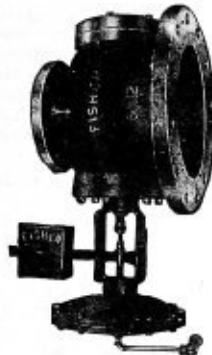


FIG. 517



FIG. 518

REGULAR PATTERN

Fisher Reducing Valves are applicable to a wide range of conditions, reducing steam, air, water, gas or oil. Do not fail to specify whether globe or angle pattern is wanted and the maximum and minimum high and low pressure. Can furnish vertical if preferred.

Size	inches	$\frac{3}{8}$, $\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Angle, Screwed.....each		\$25.00	27.50	30.00	35.00	42.50	50.00	58.00	70.00
" " Flanged				35.00	40.00	45.00	50.00	60.00	75.00
" Globe, Screwed.....		27.50	28.50	32.50	37.50	45.00	52.50	60.00	72.50
" " Flanged				35.00	40.00	45.00	55.00	65.00	80.00
Size	inches	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	8	10	12
Price, Angle, Flanged.....each		\$87.50	100.00	112.50	125.00	150.00	225.00	275.00	450.00
" Globe, Flanged.....		90.00	110.00	122.50	135.00	150.00	225.00	275.00	450.00

Prices of extra heavy on application.

INCREASED OUTLET TYPE

This type is intended for low pressure on steam heating plants. Being of the inverted type, the pipe line can be placed near the ceiling, while with a vertical type this is impossible. Can furnish increased outlet valves in vertical type if preferred.

Size	inches	1x1½, 1½ or 2	1½x1½, 2 or 2½	1½x2, 2½ or 3	2x2½, 3, 3½ or 4				
Price, Screwed.....each		\$32.50	\$37.50	\$47.50	\$55.00				
" Flanged..... "		40.00	45.00	50.00	55.00				
Size	inches	2½x3, 3½, 4, 4½ or 5	3x3½, 4, 4½, 5 or 6	3½x4, 4½, 5, 6 or 7	4x4½, 5, 6, 7 or 8				
Price, Screwed.....each		\$75.00	\$80.00	.....	.....				
" Flanged..... "		76.50	85.00	\$100.00	\$112.50				
Size	inches	5x6, 7, 8, 9 or 10	6x8, 9, 10 or 12	8, 9, 10, 12, 14 or 16	10x12	10x14	10x16		
Price, Flanged..ea.		\$140.00	\$167.50	\$245.00	\$300.00	\$320.00	\$350.00		
Size	inches	10x18	10x20	12x14	12x16	12x18	12x20	12x22	12x24
Price, Flanged..each		375.00	400.00	460.00	485.00	510.00	540.00	565.00	600.00

PISTON TYPE

This reducing valve is for high pressure work, handling high pressures of from 50 to 400 pounds on the reduced side of the valve. It has a cylinder with a special packed piston, same being an exclusive feature in these valves.

Made in the same sizes and takes the same list prices as the regular inverted type listed above.



FIG. 519

R-K REDUCING PRESSURE REGULATOR DIAPHRAGM AND LEVER TYPE

The above Regulator is intended for use in connection with low pressure or vacuum heating systems, and will reduce the steam from any pressure as high as 200 lbs. down to the atmosphere or into a vacuum. This valve is very sensitive in operation and on account of the large diaphragm, we recommend that on sizes of $2\frac{1}{2}$ and above that not more than 15 lbs. pressure be carried on the reduced side.

These valves may be installed in an inverted position.

Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
List Price..	\$22.00	22.00	28.00	31.00	35.00	42.00
Size	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
List Price..	\$52.00	64.00	68.00	80.00	90.00	120.00

Valves are furnished with expanding outlets in following sizes:

Size of Valve	1x2	$1\frac{1}{4}$ x $2\frac{1}{2}$	$1\frac{1}{2}$ x3	2x4	$2\frac{1}{2}$ x5	3x6	4x8	5x10	6x12
Face to Face	4 $\frac{1}{4}$	5 $\frac{1}{4}$	6 $\frac{1}{4}$	7 $\frac{1}{2}$	10	11	13	15	16
Center to Ex. Bot.	13 $\frac{1}{2}$	13 $\frac{1}{2}$	13 $\frac{1}{2}$	15	17 $\frac{1}{2}$	17 $\frac{1}{2}$	21 $\frac{1}{2}$	23	25
Center to Ex. Top	2 $\frac{1}{4}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$	5 $\frac{1}{2}$	6
Inlet Flange, Ex. Heavy ..					$2\frac{1}{2}$ x7 $\frac{1}{2}$	3x8 $\frac{1}{2}$	4x10	5x11	6x12 $\frac{1}{2}$
Outlet Flange, Stand.		$2\frac{1}{2}$ x7	3x7 $\frac{1}{2}$	4x9	5x10	6x11	8x13 $\frac{1}{2}$	10x16	12x19
Shipping Weight	60	90	120	160	180	200	240	320	370
List Price	\$33	\$40	\$48	\$58	\$72	\$80	\$120	\$160	\$210

R-K PILOT VALVE TYPE, REDUCING VALVE

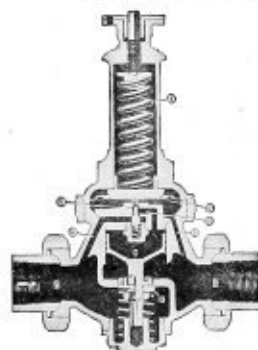


FIG. 520

Valves up to and including 2 inch size are made all bronze with ground union ends, $2\frac{1}{2}$ inch and larger have cast iron bodies with flanged ends and bronze trimmings.

All valves suitable for 200 lbs. working pressure.

For Government service, all sizes of valves can be furnished with flanged ends to conform to the latest Standard of the Bureau of Steam Engineering. Padlock and key not furnished unless specified. If required, add \$1.00 net extra to price.

Valves are furnished with diaphragm springs for ranges of pressures as follows: 5 to 50 lbs.; 50 to 140 lbs.; 140 to 200 lbs. When ordering valves, state reduced pressure to be maintained. These valves will work within 15 lbs. of the initial pressure.

One-half inch, $\frac{3}{4}$ inch and 1 inch valves take $2\frac{1}{2}$ inch O. D. Copper Diaphragm.

One and one-quarter inch and larger valves take $3\frac{3}{8}$ inch O. D. Copper Diaphragm.

Size of Valve	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
End to End of Unions	6 $\frac{1}{4}$	6 $\frac{1}{4}$	7 $\frac{1}{4}$	7 $\frac{3}{4}$	8 $\frac{3}{4}$	10
Center of Valve to Top	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{3}{4}$	9 $\frac{3}{8}$	9	9 $\frac{1}{4}$
Center of Valve to Bottom	1 $\frac{1}{8}$	1 $\frac{1}{8}$	2	2 $\frac{1}{2}$	2 $\frac{1}{2}$	3
List Price	36.00	36.00	46.00	55.00	72.00	90.00
Size of Valve	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
Face to Face of Flanges	11	12	13	14	16	17
Center of Valve to Top	11 $\frac{1}{2}$	11 $\frac{1}{2}$	13	13 $\frac{1}{2}$	14 $\frac{1}{2}$	15
Center of Valve to Bottom	5	5	6	7	7 $\frac{1}{4}$	8 $\frac{1}{4}$
List Price	115.00	130.00	148.00	155.00	180.00	210.00

CRANE PRESSURE REGULATORS

FOR SATURATED STEAM OR AIR WORKING PRESSURES
UP TO 250 POUNDSFOR SUPERHEATED STEAM WORKING PRESSURES UP TO 200 POUNDS
AND A TOTAL TEMPERATURE OF 800 DEGREES FAHRENHEIT

Wherever it is necessary or desirable to reduce the pressure of steam or air, Crane Pressure Regulators should be used because they are designed particularly to give accurate automatic pressure regulation. Our regulators are recommended because they possess the following features: Reliability, wide range of variation in reduced pressure, simplicity of operation, accessibility for inspection, convenience in making repairs.

All Crane Pressure Regulators are made for any initial working pressure of air or saturated steam up to 250 pounds. They may also be used with superheated steam up to 200 pounds working pressure and a total temperature not to exceed 500 degrees Fahrenheit.

One pressure regulator will perform the entire reduction regardless of the difference between initial and reduced pressures provided a regulator of the proper capacity is used.

No. 962. Union Ends



FIG. 521

Crane Pressure Regulators are adapted for use with steam heating systems, vulcanizers, cookers, paper machines, engines, pumps, turbines, dryers, various industrial processes, air tools, blasts, heaters of various kinds, etc.

No. 963. Flanged

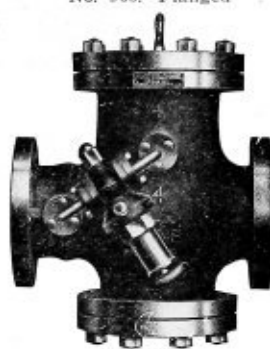


FIG. 522

Size, inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2
No. 962, each	\$43.00	48.00	54.00	67.00	83.00	104.00	130.00
No. 963, each							
Size, inches	3	3 1/2	4	5	6	8	
No. 962, each							
No. 963, each	\$155.00	200.00	225.00	310.00	420.00	800.00	

Navy Type of Spring Case equipped with padlock, supplied with any size, at \$7.00 extra list.

Regulators are regularly furnished with the pilot valve on the left hand side. Sizes 1/2 to 2 inch, inclusive, will be furnished right hand when so ordered. Sizes 2 1/2 to 8 inch, inclusive, are reversible and may be changed "on the job" to either right or left hand.

Facing the inlet, the side the pilot valve is on determines whether the Regulator is right or left hand.

The No. 963 is regularly furnished with flanges faced and drilled, for which no extra charge is made. For drilling templates, see page 93. The port openings of the No. 963, sizes 2 1/2 to 8 inch, inclusive, are tapped iron pipe size so that the valves may be connected by screwed joints if desirable. The No. 962, sizes 1 to 2 inch, inclusive, have union connections.

IMPORTANT NOTE.—A Regulator will not give satisfactory service unless it is of the proper size. This is not determined by the size of the pipe line in which it is to be placed but by the service it is to perform.

K. & T. PRESSURE REGULATORS

No. 0 Without Dashpot



FIG. 523

No. 2 Expanded Outlet

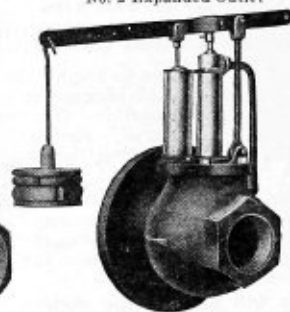


FIG. 524

No. 1 With Dashpot



FIG. 525

For service in reducing steam, water or air. Standard valves are for steam suitable for initial pressures up to 150 lbs. In ordering state initial and reduced pressures also state when for water or air.

No. 0 Regulator is for service where there is no sudden variation of volume used, as for heating coils. They are fitted for dashpots which can be added where required after installed.

No. 1 Regulator with dashpot is for service where there is a sudden variation in volume used, as on an engine or pump, also when required to control a number of heating coils or other apparatus.

No. 2 regulator with expanded outlet is similar in construction to the No. 1 style and is especially adapted for controlling heating mains.

PRICE LIST K. & T. NOS. 0 AND 1 PRESSURE REGULATORS

Size	inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
No. 0		\$18.00	\$20.00	\$22.00	\$24.00	\$25.00	\$30.00	\$35.00	\$40.00
No. 1		22.00	24.00	26.00	28.00	30.00	36.00	42.00	48.00
Face to face, screwed		3 3/4	3 3/4	4 1/4	4 1/4	4 3/4	6 1/2	8	9 1/4
" " " flanged							7 1/2	9	9 3/4
" " " ex. hy., flanged							8	9 3/4	10 1/2
Approximate shipping wgt. ..		16	16	17	18	25	50	60	76
Size	inches	3 1/2	4	5	6	7	8	10	12
No. 0		\$50.00	60.00	75.00	100.00	135.00	175.00	275.00	400.00
No. 1		60.00	72.00	90.00	120.00	160.00	200.00	300.00	435.00
Face to face, screwed		9 7/8	9 7/8	11 1/4	12 1/4				
" " " flanged		10 1/4	10 3/4	12 1/4	13	14 1/2	16 1/4	20 1/4	22 3/4
" " " ex. hy., flanged		10 3/4	11 1/4	12 3/4	13 3/4	15 1/2	17 1/4	21 3/4	24 3/4
Approximate shipping wgt. ..		95	130	140	185	200	260	450	525

PRICE LIST K. & T. NO. 2 PRESSURE REGULATOR (EXPANDED OUTLET)

Size, Inches	Price, Each	Size, Inches	Price, Each	Size, Inches	Price, Each
1 x 2	\$ 35.00	3 1/2 x 7	\$110.00	6x10	\$250.00
1 1/4 x 2 1/2	40.00	4 x 6	110.00	6x12	335.00
1 1/2 x 3	48.00	4 x 7	130.00	8x10	350.00
2 x 3	54.00	4 x 8	160.00	8x12	400.00
2 x 4	60.00	5 x 8	170.00	8x14	430.00
2 1/2 x 5	80.00	5 x 9	220.00	8x16	475.00
3 x 5	90.00	5 x 10	235.00	10x16	650.00
3 x 6	100.00	6 x 8	220.00	10x20	700.00

Note—No. 2 in sizes 1x2 to 2x4 inclusive, screwed ends; 2x4 to 4x7 inclusive, inlet screwed and outlet flanged; 1 1/2x3 and all sizes above flanged both ends.

K. & T. LOW PRESSURE REGULATORS

No. 3 Straight Way



FIG. 525

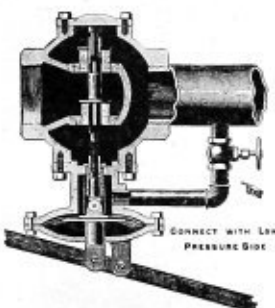


FIG. 527

No. 4 Expanded Outlet



FIG. 526

For service in reducing steam, water or air. Especially adapted for vacuum steam heating systems, also atmospheric or very low pressure steam heating.

Standard valves are for steam suitable for initial pressures up to 150 lbs., and a reduced pressure not exceeding 5 lbs. In ordering state initial and reduced pressures also state when for water or air.

This regulator is operated by an independent diaphragm controlled by pressure through a small pipe direct from the low pressure system at a distance from the regulator where the pressure is about average excepting on sizes 1½-inch and under, where this connection is made through bottom valve cap.

No. 3 regulator is straightway valve with inlet and outlet connections same size.

No. 4 regulator is similar in construction to No. 3 regulator with expanded outlet and is especially adapted for controlling heating mains.

PRICE LIST K. & T. NO. 3 LOW PRESSURE REGULATOR

Size	inches	¾	1	1¼	1½	2	2½	3	3½
Price	each	\$26.00	\$28.00	\$32.00	\$35.00	\$40.00	\$50.00	\$60.00	\$70.00
Face to face, screwed.....		3¾	4¾	4¾	4¾	6¾	8	9¾	9¾
" " flanged						7½	9	9¾	9¾
Approximate shipping wgt..		16	18	20	30	55	65	81	100
Size	inches	4	5	6	7	8	10	12	
Price	each	\$80.00	\$105.00	\$140.00	\$180.00	\$230.00	\$290.00	\$360.00	
Face to face, screwed.....		9¾	11¼	12¼					
" " flanged		10¾	12¾	13	14¾	16¼	20¼	22¾	
Approximate shipping weight.....		135	145	190	200	260	450	525	

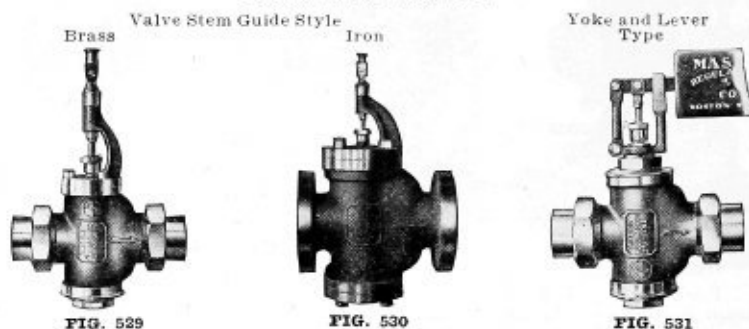
PRICE LIST K. & T. NO. 4 LOW PRESSURE REGULATOR
(EXPANDED OUTLET)

Size, Inches	Price, Each	Size, Inches	Price, Each	Size, Inches	Price, Each
1 x2	\$ 40.00	3½x 7	\$145.00	6x10	\$300.00
1¼x2½	50.00	4 x 6	160.00	6x12	320.00
1½x3	60.00	4 x 7	175.00	8x10	340.00
2 x3	70.00	4 x 8	190.00	8x12	350.00
2 x4	80.00	5 x 8	210.00	8x14	400.00
2½x5	90.00	5 x 9	230.00	8x16	450.00
3 x5	110.00	5 x10	250.00	10x16	600.00
3 x6	130.00	6 x 8	280.00	10x20	650.00

Note—No. 4 in sizes 1x2 to 2x4 inclusive, screwed ends; 2x4 to 4x7 inclusive, inlet screwed and outlet flanged; 1½x3 and all sizes above flanged both ends.

MASON BALANCED VALVES AND DAMPER REGULATORS

BALANCED VALVES



Mason Balanced Valves are made in two styles, as shown above. They can be furnished in either the piston type or with bevel seats.

The small sizes are all bronze with union ends, threaded for iron pipe, while the larger sizes have iron bodies with all internal wearing parts of bronze, the ends being flanged extra heavy standard.

They are used to control pumps, engines, etc., by means of tank floats or cords to distant points, and also for controlling the flow of water to receivers, feed water heaters, open tanks, etc.

The area of all seats is so designed that a perfect balance is obtained, and the valves may be operated with a minimum amount of power, the lever type being self-closing.

ALL BRONZE—SCREWED—EITHER STYLE

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Price	each	\$5.50	\$6.50	\$8.00	\$9.00	\$10.50

IRON BODY—FLANGED—EITHER STYLE

Size	inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	8	10	12
Price	each	\$13.00	19.50	25.00	31.00	37.00	55.00	75.00	103.00	160.00	200.00	286.00

DAMPER REGULATORS

STYLE NO. 4

They will automatically operate the damper so as to maintain a uniform boiler pressure, insuring a saving in fuel as well as accurate regulation.

The standard regulator is suitable for controlling boiler pressures between 20 and 180 pounds. When ordered pressures below 20 pounds, it must be so stated, as a larger diaphragm is necessary than regularly furnished.

Price, with Bronze Cylinder and Trimmings...each \$60.00

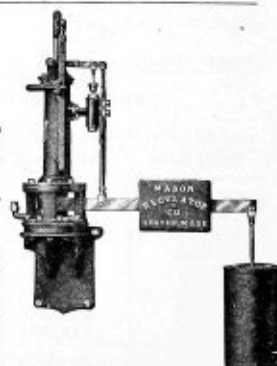


FIG. 532

R-K AUTOMATIC DAMPER REGULATOR

Our standard regulator (Weighted Motor Type) has a single-acting motor operated by water pressure on the upward stroke of the plunger and by weights at top of motor cylinder for the return stroke. Or (Pull Motor Type) with the water pressure entering the top of motor cylinder, a weight on the damper arm for the return stroke.

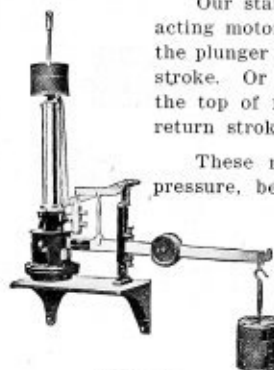


FIG. 533

These regulators will respond to the slightest variation in pressure, being provided with a compensating arrangement will enable the regulator to cut off at a partial stroke, the damper being moved the minimum necessary to secure a uniform furnace temperature.

Accessories: Weights, 35 foot chain, 2 pulleys, filtering chamber, union elbows on pilot valve and setting-up directions furnished with each regulator.

Low. Pres. Regulators, 0 to 5 lbs. List, each.....	\$.....
Med. Pres. Regulators, 5 to 20 lbs. List, each.....	\$.....
High Pres. Regulators, 25 to 200 lbs. List, each.....	\$.....

Standard regulators have 2 1/4 inch o. d. by 15 inch motors. We can furnish larger and longer motors, if desired.

Prices upon application.

R-K IMPROVED PILOT VALVE

Operation: Normally, valve is in position as shown by cut; when the steam pressure increases, valve stem is raised, admitting water at (1) through admission ports (4) to motor cylinder at (2) and closes damper. A decrease in the steam pressure forces the valve stem downward, closing admission ports (4) and opening exhaust ports (5), allowing water from motor cylinder to exhaust at (3) and open damper.

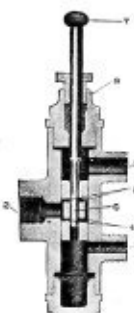


FIG. 534

LOW PRESSURE DAMPER REGULATOR



FIG. 535

The Regulator shown is for automatically controlling the check drafts on low pressure steam boilers employed in house heating. This regulator is made in two sizes, of best material and workmanship, and can be furnished with or without the bottle siphon.

Plain as shown, 7 inch plates.....	List, each \$5.00
Plain as shown, 9 inch plates.....	List, each 7.50

MASON PUMP REGULATORS

Key Style



FIG. 536

Spring Type



FIG. 537

Lever Type



FIG. 538

Mason Steam Pump Pressure Regulators are designed for fire, boiler feed, air, and water works pumps having steam supply pipe 4 inches or smaller, or any class of pumping machinery where it is necessary to maintain a constant pressure. They are placed in the steam supply pipe to the pump and connected by a $\frac{1}{4}$ -inch pipe to the discharge system, thereby exactly regulating the amount of steam to the requirements of the pump, and automatically maintaining a uniform discharge pressure, regardless of any variation of steam pressure or demand on the pump. Lever type is furnished only in sizes 2-inch and larger.

KEY STYLE AND LEVER TYPE

Size .....inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price, Bronze, Unions..ea.	\$20.00	20.00	25.00	30.00	42.00	55.00	.....	.....	.....	.....
Price, Iron, Flanged...ea.	.....	.....	.....	.....	.....	.....	68.00	85.00	100.00	115.00

SPRING TYPE

Size .....inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price, Bronze, Unions..ea.	\$18.00	18.00	22.00	28.00	35.00	44.00	.....	.....	.....	.....
Price, Iron, Flanged...ea.	.....	.....	.....	.....	.....	.....	57.00	72.00	85.00	100.00

STEAM PUMP SPEED GOVERNORS

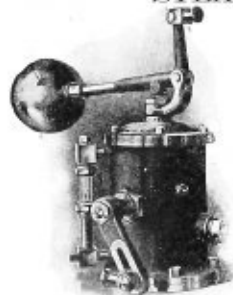


FIG. 539

The Mason Steam Pump Speed Governor is to the direct-acting steam pump what the ordinary ball governor is to the steam engine. It derives its motion from some reciprocating part of the pump and controls a balanced valve placed in the steam pipe, thereby exactly regulating the amount of steam to the requirements of the pump, and automatically maintaining a uniform speed, regardless of any variation of steam or load. By the use of a key the speed of the pump can be changed, if desired, while the pump is in motion.

These governors are extensively used on direct-acting steam pumps (both single and duplex), also on all classes of flywheel pumps, including vacuum pumps, air compressors and ice machines.

Always state when governors are to be used on direct-acting duplex pumps, as a slight modification is necessary on all governors (except double-acting), to prevent the fall of the governor ball, and the consequent excess opening of the balanced valve, during the momentary pause of the piston, incident to duplex pumps. Prices on application.

K. & T. PUMP GOVERNORS AND REGULATORS

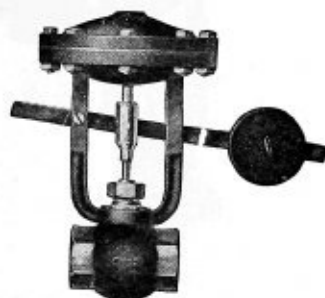
Vacuum Pump
Governor

FIG. 540

Pump Governor



FIG. 541

Auto. Pump Regulator
and
Condensation Receiver

FIG. 542

K. & T. VACUUM PUMP GOVERNOR

For regulating the speed of vacuum pumps, automatically controlling the amount of vacuum carried in a heating system.

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price	each	\$25.00	\$25.00	\$30.00	\$32.50	\$35.00	\$40.00	\$45.00	\$50.00

K. & T. IMPROVED PUMP GOVERNOR

For use on boiler feed, water tanks, hydraulic elevators, gravity tanks, house supply and all pumps working under a pressure.

Size ...inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
Angle or globe screwed ends.	\$28.00	30.00	35.00	43.00	48.00	58.00	70.00	83.00	95.00	120.00	145.00
Angle or globe flanged ends.					50.00	60.00	75.00	88.00	100.00	125.00	150.00

In ordering state maximum and minimum of steam and water.

K. & T. AUTOMATIC CONDENSATION RECEIVER
AND PUMP REGULATOR

For automatically controlling pump to return condensation from heating system to boiler, also for controlling water level in receiving tanks. The operating valve is a perfectly balanced steam-tight valve, and is operated by a mechanical movement which is positive and reliable.

Number	0	1	2	3	4
Price	\$70.00	\$100.00	\$130.00	\$150.00	\$200.00
Inlet and outlet	1½	2	2½	3	4
Steam valve outlet	½	¾	1	1¼	1½
Square feet radiation	5000	10000	20000	30000	40000

FISHER PUMP GOVERNORS

Regular Pattern



FIG. 543

Excess Pressure



FIG. 544

Vacuum Pump



FIG. 545

Regular Pattern Governor—For pressures from 5 to 500 pounds. Can also be furnished to carry a hydraulic pressure of 10,000 pounds.

Excess Pressure Governor—Designed as a thoroughly reliable excess pressure pump governor.

Vacuum Pump Governor—This type is to be used in connection with all vacuum systems of heating or where a certain number of inches of vacuum are to be maintained. Specify number of inches of vacuum required, when ordering.

Size Inches	PRICE, EACH									
	Regular Pattern		Excess Pressure				Vacuum Pump			
	Angle		Angle		Globe		Angle		Globe	
	Scrwd.	Flgd.	Scrwd.	Flgd.	Scrwd.	Flgd.	Scrwd.	Flgd.	Scrwd.	Flgd.
*1/4	3/8	25.00	.....	25.00	.....	.....	.....	.....	.....	.....
1/2		25.00	.....	25.00	.....	25.00	.....	30.00	.....	30.50
3/4		27.50	.....	27.50	.....	27.50	.....	30.00	.....	30.50
1		30.00	35.00	30.00	37.50	30.00	35.00	37.50	35.00	40.00
1 1/4		35.00	40.00	35.00	42.50	35.00	42.50	40.00	45.00	41.00
1 1/2		42.50	45.00	42.50	47.50	42.50	45.00	42.50	47.50	50.00
2		50.00	50.00	50.00	52.50	50.00	50.00	50.50	52.50	55.00
2 1/2		58.00	60.00	58.00	63.00	58.00	60.00	58.00	63.00	65.00
3		70.00	75.00	70.00	78.50	70.00	75.00	70.00	78.50	80.00
3 1/2		82.50	87.50	82.50	90.00	82.50	87.50	82.50	90.00	92.50
4		100.00	.....	105.00	.....	100.00	.....	105.00	.....	105.00
4 1/2		112.50	.....	117.50	.....	112.50	.....	117.50	.....	.....
5		125.00	.....	130.00	.....	125.00	.....	130.00	.....	.....
6		150.00	.....	160.00	.....	150.00	.....	160.00	.....	.....
7		187.50	.....	197.50	.....	.....	.....	.....	.....	.....
8		225.00	.....	235.00	.....	.....	.....	.....	.....	.....
10		275.00	.....	275.00	.....	.....	.....	.....	.....	.....
12		450.00	.....	450.00	.....	.....	.....	.....	.....	.....

Give maximum and minimum boiler pressure, also maximum and minimum pump discharge pressure. If used on anything besides cold water, give kind of liquid. Furnished also in extra heavy flanged.

*Angle not made in 1/4-inch size.

FULTON PUMP GOVERNOR

EITHER PISTON OR DIAPHRAGM TYPES

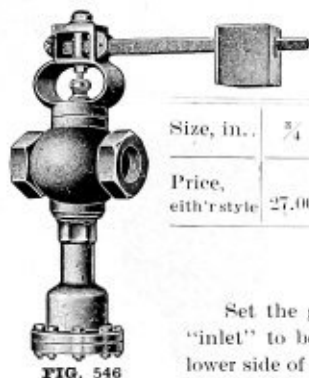


FIG. 546

Size, in.	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	6
Price, either style	27.00	30.00	35.00	42.00	50.00	58.00	70.00	100.00	150.00

DIRECTIONS FOR OPERATING

Set the governor in steam line to pump with side marked "inlet" to boiler, "outlet" to steam cylinder of pump, connect lower side of piston or diaphragm to discharge line of pump.

VIGILANT FEED WATER REGULATOR

PRICE LIST

Each Vigilant Feed Water Regulator as shipped, includes: one Regulator; one $1\frac{1}{4}$ inch Brass Angle or Gate Valve; one $1\frac{1}{4}$ inch Ground Joint Brass Union; one Column Attachment; one Controlling Valve of proper size of feed pipe. Extra price if feed pipe exceeds $2\frac{1}{2}$ inches.

VIGILANT FEED WATER REGULATOR,
standard machine for all purposes up to
200 lbs. 125.00

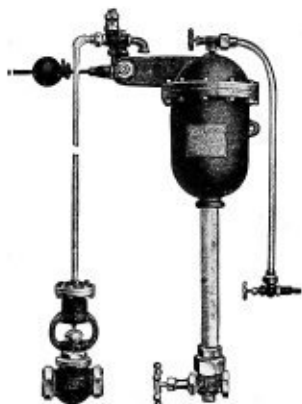


FIG. 547

DIRECTIONS FOR ORDERING

Should boilers be of the horizontal water tube type, state on which side of water column you wish to place regulator. A left hand machine is one on which the weighted lever, while facing regulator, is to the left, and vice versa. In vertical types the same idea can be carried out. Care must be taken where the water columns have only one float, and this float passes second gauge cock. You will notice this fact particularly, and we will then furnish a fitting to take the place of the special nipple; and at the same time, give us size of gauge cock opening; also state size of feed line leading to boiler, as this governs size of controlling valve. If injector is used, give size of steam line, and name of injector.

SIZE OF REGULATOR

Diameter of chamber, $9\frac{1}{2}$ inches at flanges. Distance from top of chamber to bottom, $15\frac{1}{2}$ inches. From side of flanges to extreme end of weighted lever, 23 inches.

CRISPIN AIR VALVES FOR PIPE LINES

Automatic Air and Vacuum Valve

Pressure Air Valves



FIG. 548



FIG. 549

CRISPIN AUTOMATIC AIR AND VACUUM VALVES

This valve automatically performs two functions. It permits the escape of air from the pipe line while it is being filled and it also permits air to enter the pipe line while it is being emptied.

Diam. of Valve Opening .....Inches	½	1	2	3	3	4	4	6 Cluster 2-4	8 Cluster 4-4
Diam. Inlet Connection .....Inches	½	1	2	3	3	4	4	6	8
Type of Valve.....	Scrd.	Scrd.	Scrd.	Scrd.	Flgd.	Scrd.	Flgd.	Flgd.	Flgd.
Diam. Outlet Connection .....Inches	½	1	2	3	3	4	4	6	8
Shipping weight..Lbs.	10	18	44	81	92	142	154	485	880
List Price .....Each	\$ 9.50	14.50	26.00	47.00	47.00	77.00	77.00	167.00	321.00

The 6-inch Valve is composed of two 4-inch; the 8-inch of four 4-inch valves.

CRISPIN PRESSURE AIR VALVES

This valve is intended to be placed on pipe lines at high points where air accumulates and obstructs the flow of water. It automatically permits air to escape while the pipe line is in service and under pressure.

Diam. of Valve Opening .....In.	¾	¾	¾	¾	¾	1½	1½	1½	1½	1½	1½
Diam. Inlet Connection .....In.	2	2½	2½	3	3	2½	2½	3	3	4	4
Type of Valve.....	Scrd.	Scrd.	Flgd.	Scrd.	Flgd.	Scrd.	Flgd.	Scrd.	Flgd.	Scrd.	Flgd.
Working Pressure .....Lbs.	165	280	280	300	300	130	130	155	155	225	225
Shipping Wt..Lbs.	46	58	64	90	100	58	64	90	100	132	142
List Price ....Each	\$26.00	36.00	36.00	46.50	46.50	36.00	36.00	46.50	46.50	76.00	76.00
Diam. of Valve Opening .....In.	¾	¾	¾	¾	¾	¾	¾	¾	¾	1	1
Diam. Inlet Connection .....In.	3	3	4	4	3	3	4	4	4	4	4
Type of Valve.....	Scrd.	Flgd.	Scrd.	Flgd.	Scrd.	Flgd.	Scrd.	Flgd.	Scrd.	Flgd.	Flgd.
Working Pressure..Lbs.	105	100	140	140	65	65	90	90	50	50	50
Shipping Weight...Lbs.	90	105	132	142	90	100	132	142	132	142	142
List Price .....Each	\$46.50	46.50	76.00	76.00	46.50	46.50	76.00	76.00	76.00	76.00	76.00

A water pipe of any size whatever, when equipped with "Crispin Valves," needs little or no attention. To fill such a pipe you have simply to turn the water into it and go away; to empty such a pipe you have but to open an outlet valve and think no more about it. One man can fill or empty a main of any length.

FOOT VALVES WITH STRAINERS

Brass



FIG. 550

Iron Body
¾ to 6 inch

FIG. 551

BRASS

Iron Body
7 to 16 inch

FIG. 552

Size.....inches	½	¾	1	1¼	1½	2	2½	3
Price.....each	\$1.50	1.50	2.00	2.75	3.75	5.50	12.00	16.00

IRON BODY, SCREWED

Size.....inches	¾	1	1¼	1½	2	2½	3	3½
Price, Black.....each	\$1.15	\$1.30	\$1.40	\$1.90	\$2.40	\$3.30	\$3.90	\$5.60
" Galvanized....."	1.75	2.00	2.10	2.85	3.60	5.00	5.75	8.50
Size.....inches	4	4½	5	6	7	8	10	12
Price, Black.....each	\$7.30	\$10.50	\$11.25	\$14.75	\$35.00	\$41.00	\$64.00	100.00
" Galvanized....."	11.00	15.75	16.75	22.00				

IRON BODY, FLANGED

Size.....inches	2	2½	3	3½	4	4½	5	6
Price.....each	\$3.50	4.50	5.75	7.50	9.50	13.00	14.00	17.50
Diameter of Flanges.....inches	6	7	7½	8½	9	9½	10	11
Height....."	5½	6¾	7	9½	9½	11¾	11¾	12¾
Outside Diameter....."	6	7	7½	8½	9	10½	10½	11¾
Size.....inches	7	8	10	12	14	15	16	
Price.....each	\$38.00	45.00	70.00	112.00	150.00	175.00	200.00	
Diameter of Flanges.....inches	12½	13½	16	19	21	22½	23½	
Height....."	11¾	13¼	18½	18	19¾	21¾	24½	
Outside Diameter....."	13¾	15¼	19½	20¼	24½	25¼	27	

IRON STRAINERS



FIG. 553

Size.....inches	1	1½	1½	2	2½	3
Strainers, Black.....each	.40	.50	.75	1.00	1.50	2.00
Strainers, Galv....."	.50	.75	1.00	1.50	2.00	3.00
Size.....inches	3½	4	5	6	8	
Strainers, Black.....each	3.00	3.75	4.75	6.50	12.00	
Strainers, Galv....."	4.50	6.00	7.00	10.00	20.00	

SWABY FOOT VALVES



FIG. 554



FIG. 555

In pumping much power is frequently wasted by the use of poorly designed foot valves having small waterways which resist the free passage of the water. This trouble often occurs when operating centrifugal pumps, where, owing to the large amount of water handled through short pipes, a restricted suction opening will cause a great loss due to friction. To remedy this difficulty we offer a specially designed foot valve for use on centrifugal pumps. These valves have unusually large waterways, not only through the valves, but through the strainers, as well.

They are provided with a pair of rubber-faced hinged valves swinging on a brass rod, thus preventing corrosion and consequent sticking.

The strainer has openings large enough to admit any solid which will pass readily through the pump. This strainer is independent of the foot valve and can be attached or detached by means of a single bolt.

We recommend the use of these foot valves with centrifugal pumps in all cases where a foot valve is necessary.

Price of screwed and flanged valves is the same. Screwed valves always furnished unless otherwise ordered. 15 inch size is made flanged only.

FOOT VALVES

Size Inches	Price Iron	Price Brass
2	\$ 5.00	\$ 18.00
2½	7.00	24.00
3	8.00	27.00
3½	8.50	35.00
4	10.00	45.00
4½	11.00	50.00
5	12.00	55.00
6	15.00	85.00
8	22.00	140.00
10	35.00	.....
12	48.00	.....
15	80.00	.....

EMERSON FOOT VALVES AND QUICK-CLEANING STRAINERS

The Strainer is designed to slide up on the suction pipe and ropes may be attached to facilitate this operation. When cleaning is needed, this unique device saves time and labor and usually obviates the need of stopping the pump. The Strainer is of heavy flange steel with perforations $\frac{1}{8}$ inch in diameter.

In the construction of the Foot Valves, the water passages are direct and have an area one-third greater than that of the suction pipe which they fit, thus giving the fluids quick, free access to the pump. There are no hinges, springs nor stem, which in other valves jam and fail to close tight. The valve gate operates freely in heavy guides cast in the valve body—all of which makes for durability and a minimum of trouble. When the EMERSON FOOT VALVE closes it is closed tight. It drains a sump very low because the openings extend to the bottom. They are strongly built and will wear indefinitely, but can be made of brass or galvanized when specially ordered. They are made to fit large and small pumps, from 2-inch up to 30-inch suction pipe, the smaller sizes having screw connection with the sizes from 8 to 12 inches, either screw or flange as desired. Sizes above 12 inches are with flange connection only. They can be used on any pump and are invaluable on all pumping operations, and in paper mills, breweries, sugar refineries, and municipal water and sewerage plants.

Strainer
Raised for
Cleaning



FIG. 556

PRICE LIST OF FOOT VALVES AND STRAINERS

Size of Suction Pipe in Inches	Price of Foot Valves and Strainers Complete	Price of Foot Valve Alone	Price of Strainers Without Foot Valves (With Base)	Approximate Shipping Weight (Complete) (Pounds)
2	\$ 18.00	\$ 13.50	\$ 11.00	60
2½	19.00	14.50	12.00	60
3	20.00	15.50	13.00	75
4	30.50	23.00	18.50	130
5	40.00	30.00	24.00	190
6	50.00	37.00	30.00	230
7	59.75	45.00	36.50	285
8	66.00	50.50	41.00	330
10	90.00	67.50	45.00	500
12	120.00	90.00	60.00	800
14	180.00	135.00	90.00	1200
16	200.00	150.00	100.00	1350
18	250.00	187.50	125.00	1700
20	275.00	200.25	137.50	2000
24	425.00	318.75	212.50	2900
28	750.00	562.50	375.00	3500
30	825.00	618.75	412.50	4000

*NOTE—For F. V. with flange connection, in sizes from 8 to 12 inches, add 5 per cent to above price list.

NOTE—The above list prices are subject to a general increase of 10 per cent.

BRASS STEAM COCKS

FOR WORKING PRESSURE UP TO 100 POUNDS

No. 266 Flat Head
Male and Female

FIG. 557

No. 252 Flat Head



FIG. 558

No. 250 Square Head



FIG. 559

No. 268 Three-Way Square
Head With Check

FIG. 560

MALLEABLE WRENCHES FOR STEAM
AND GAS COCKS

Square Head



FIG. 561

Flat Head



FIG. 562

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	*4
No. 266	each	\$1.35	1.45	2.00	2.50	3.00	5.35	6.75	9.85	.....	.....	.....	.....
No. 252	each	.85	1.00	1.25	1.70	2.35	3.70	4.85	7.30	14.50	22.50	38.50	50.00
No. 250	each	.85	1.00	1.25	1.70	2.35	3.70	4.85	7.30	14.50	22.50	38.50	50.00
No. 254 square head with check	each	.....	.....	1.40	1.90	2.55	3.95	5.15	7.65	.....	.....	.....	.....
No. 268	each	1.80	2.10	2.50	3.00	3.75	5.75	7.15	11.00	18.75	26.00	.....	.....

*Made to order only.

SQUARE HEAD STEAM COCK WRENCHES

Number	1	2	3	4	5	6	7	8	9	9	10	10
Size ..inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price ...each	\$0.05	.06	.07	.09	.14	.19	.25	.44	.56	.56	1.00	1.00

FLAT HEAD STEAM COCK WRENCH

Number	1	2	3	5	6	7	8
Size .....inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price .....each	\$0.07	.09	.14	.25	.44	.56	1.00

EXTRA HEAVY HARD METAL STEAM COCKS

FOR STEAM WORKING PRESSURES
UP TO 250 POUNDS

Size Inches	Price Each	Size Inches	Price Each
1/4	\$ 1.40	1 1/4	\$ 6.00
3/8	1.75	1 1/2	7.75
1/2	1.75	2	11.50
3/4	2.40	2 1/2	23.00
1	3.60	3	35.00

These Cocks are made of hard metal which is almost as hard as steel, are extra heavy, with liberal bearings, and are finished with great care.

These important features insure a tight cock which will give good service.

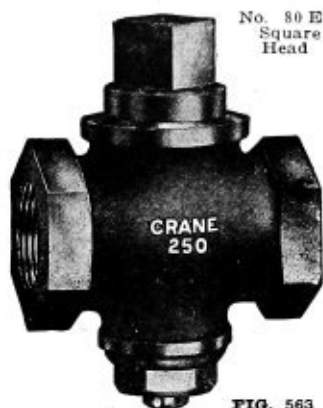


FIG. 563

STANDARD BRASS GAS SERVICE COCKS

No. 270.
Flat Head

FIG. 564

No. 272.
Square head

FIG. 565

Size	inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
No. 270, Flat Head, Female.....each	\$0.75	.85	.95	1.15	1.50	2.25	3.10	5.00	
No. 272, Square Head, Female.....each	.75	.85	.95	1.15	1.50	2.25	3.10	5.00	

SPECIAL HEAVY BRASS GAS SERVICE COCKS

No. 292.
Flat Head

FIG. 566

No. 294.
Square head

FIG. 567

Size	inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Price	each	\$0.85	.95	1.05	1.30	1.70	2.60	3.60	6.50	12.00	18.00

Flat Head Gas Cocks are always furnished, unless otherwise ordered.

IRON COCKS

Made Square or Flat Head,
Screwed

FIG. 568

Flanged



FIG. 569

Three-Way



FIG. 570

STANDARD IRON COCKS—SCREWED

Size.....inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	8
All iron.....each	.90	1.05	1.30	1.60	1.95	2.70	4.40	6.75	12.00	15.50	32.00	45.00	100.00
With brass washer.....each	1.00	1.20	1.55	1.95	2.35	3.20	5.15	7.75	14.00	19.00	38.00	53.00	110.00
With brass plug.....each	1.30	1.60	1.90	2.65	3.75	5.25	8.75	13.00	27.50	36.50	67.00	94.00	200.00

Flat head 1/2 to 2 inch and square head 2 1/2 to 8 inch will always be furnished unless otherwise ordered.

STANDARD IRON COCKS—FLANGED

Size.....inches	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	8
All iron.....each	2.25	2.75	3.25	4.25	6.25	9.50	15.00	19.00	36.00	50.00	107.00
With brass washer.....each	2.50	3.10	3.65	4.75	7.00	10.50	17.00	22.50	42.00	58.00	117.00
With brass plug.....each	3.00	3.75	5.00	7.00	10.50	15.75	30.00	40.00	70.00	100.00	210.00
Diameter of flanges.....inches	4	4 1/2	5	6	7	7 1/2	8 1/2	9	10	11	13 1/2

EXTRA HEAVY IRON COCKS

MALLEABLE PLUG, NUT AND WASHER

Size.....inches	1	1 1/4	1 1/2	2	2 1/2	3	4
Price.....each	\$2.50	3.00	4.00	5.00	10.00	13.00	31.00

EXTRA HEAVY IRON COCKS

CAST-IRON PLUG, NUT AND WASHER

Size.....inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
All iron.....each	\$1.15	\$1.25	\$1.75	\$2.10	\$2.80	\$3.65	\$6.50	\$9.00	\$22.50
With brass washer.....each	1.25	1.40	2.00	2.45	3.20	4.15	7.25	10.00	26.00
With brass plug.....each	1.70	2.25	2.80	3.85	5.00	7.00	13.25	19.00	56.00

THREE-WAY IRON COCKS—SCREWED

Size.....inches	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6
All iron.....each	1.65	1.80	2.05	2.65	3.65	5.35	7.50	14.00	19.00	36.50	52.00
With brass washer.....each	1.80	2.05	2.40	3.05	4.15	6.10	8.50	16.00	22.50	42.50	60.00
With brass plug.....each	2.20	2.40	3.10	4.50	6.25	9.75	13.75	30.00	40.00	71.50	100.00

ASBESTOS PACKED PLUG COCKS

MADE IN EITHER IRON OR BRASS. FOR STEAM, OIL, TAR,
AMMONIA, ETC.

FIG. 571

PRICE LIST

Size	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Regular Iron	1.30	1.30	1.45	1.60	2.10	2.50	3.50	4.75
Bushing Packed				1.75	2.30	2.75	3.85	5.25
Extra Heavy Iron				2.40	3.00	3.50	5.00	6.75
Angle Iron		1.30	1.45	1.60	2.10	2.50	3.50	4.75
Three-Way Iron				2.85	3.15	4.40	5.95	8.75
Straight Way Brass	3.35	3.35	3.35	3.35	4.20	5.60	8.00	10.35
Recessed Ammonia	1.40	1.50	1.60	2.10	2.50	3.50	4.75	
Gland End Ammonia		2.10	2.25	2.45	3.10	3.65	4.75	6.10

Size	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
Regular Iron	7.00	12.00	18.00	27.00	30.00	45.00	60.00
Bushing Packed	7.75	13.25	20.00				
Extra Heavy Iron	10.00	17.00	26.00	38.00	42.00	60.00	
Angle Iron	7.00	12.00	18.00				
Three-Way Iron	15.00	22.50	33.75	37.50	56.25	75.00	
Straight Way Brass	16.00	26.50	37.50	50.50	64.00		
Recessed Ammonia	7.00	12.00	18.00				
Gland End Ammonia	8.65	15.50	23.00				

REMOVABLE ASBESTOS BUSHINGS AND TOP RINGS
FOR REPACKING BUSHING PACKED COCKS

They cannot, however, be used in the Cell-Packed Cocks. These Bushings are made in one solid piece, vulcanized, and with no seams to pull apart in use by constant turning of the plug, which heretofore has been a great source of annoyance and trouble.

NET PRICE LIST

Size.....inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Bushings.....	.75	.75	1.00	1.40	1.90	2.40	2.90	3.50
Top Rings	.25	.25	.25	.25	.30	.40	.50	1.00

In ordering Cocks, advise whether the U-packed or the Bush-packed are wanted, as we always send the U-packed style unless otherwise ordered.

Also when ordering Top Rings alone, state whether they are wanted for the U-packed or Bush-packed Cocks.



FIG. 572

**STOPS AND STOP AND WASTES
FOR IRON PIPE
FLAT WAY—TEE HANDLE**

ROUGH STOPS

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Per dozen.....		\$19.80	20.40	21.00	29.40	36.00	52.80	89.40	149.40	258.00

STOP AND WASTES

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Per dozen.....		\$20.40	21.00	21.60	30.00	36.60	54.00	91.20	152.40	264.00

Stop and Waste

LEVER HANDLE—FLAT WAY



FIG. 573

ROUGH STOPS

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Per dozen.....		\$19.80	20.40	21.00	29.40	36.00	52.80	89.40	149.40	258.00

STOP AND WASTES

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Per dozen.....		\$20.40	21.00	21.60	30.00	36.60	54.00	91.20	152.40	264.00

No. 820, Flat Way, or
No. 822, Round Way Tee
or Lever Handle

**REVERSIBLE STOP AND
WASTE COCKS
TESTED TO 200 POUNDS HYDRAULIC
PRESSURE
SCREWED FOR IRON PIPE
INTERCHANGEABLE FROM RIGHT
TO LEFT**



FIG. 574

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	1
No. 820, Flat Way	doz.	\$21.00	29.40	36.00	52.80
No. 820, with Check & Waste doz.		21.60	30.00	36.60	54.00
No. 822, Round Way.....	doz.	26.40	36.00	46.20	73.80
No. 822, with Check & Waste doz.		27.00	36.60	46.80	75.00

When ordering, always give style number, and state if they are wanted with or without waste, and whether with Tee or Lever Handle. Unless otherwise specified, we will furnish Lever Handle Cocks.

Waste Tubes Extra.

CORPORATION STOP COCKS

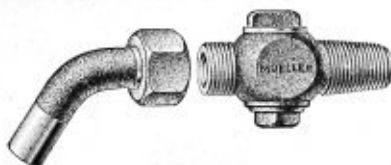


FIG. 577

No. 4. For Mueller machine screw plug, eighth bent tail piece.

THREADS

Three-eighth to 1-inch inclusive, thread on both ends; 1¼, 1½ and 2-inch Mueller on inlet end and increasing I. P. on outlet end.

Size	inches	¾	1½	¾	¾	1	1¼	1½	2
List, rough	each	\$1.50	\$1.60	\$2.25	\$2.85	\$4.50	\$10.00	\$16.00	\$26.50

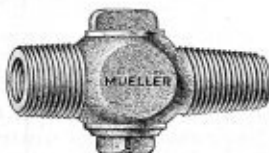


FIG. 578

No. 6. For Mueller machine screw plug, without union coupling, Mueller thread on inlet end, increasing I. P. on outlet end.

Size	inches	¾	1½	¾	¾	1	1¼	1½	2
List, rough	each	\$1.35	\$1.45	\$1.95	\$2.50	\$4.00	\$9.25	\$15.00	\$25.00
List, with union coupling	each	1.50	1.60	2.25	2.85	4.50	10.00	16.00	26.50

LEAD GOOSE NECKS

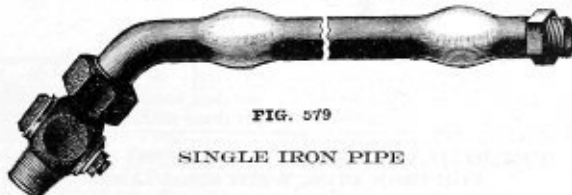


FIG. 579

SINGLE IRON PIPE

Prices are for No. 4 corporation cock and extra strong lead pipe. Furnished with outside thread soldering nipples unless otherwise specified. Inside thread at same prices, if desired.

Size	inches	¾	1½	¾	¾	1	1¼	1½	2
Length lead pipe	inches	18	18	18	18	18	24	30	36
List, with No. 4 cor. cock	each	\$4.50	\$5.25	\$6.25	\$7.25	\$10.75	\$19.50	\$31.00	\$48.50

COMPRESSION BIBBS FOR IRON PIPE, WITH SHOULDER

Plain



FIG. 580

For Hose



FIG. 581

PLAIN BIBBS

Size	in.	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Rough	per doz.	\$16.20	\$16.80	\$17.40	\$22.80	\$30.60	\$54.00	\$106.80	\$139.20	\$282.00
Finished	per doz.	18.00	18.60	19.80	25.20	33.00	60.00	114.00	150.00	300.00
Nickel-plated	per doz.	21.60	22.20	23.40	28.80	37.20	66.00	124.80	165.00	330.00

HOSE BIBBS

Size	in.	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Rough	per doz.	\$19.80	\$20.40	\$25.80	\$33.60	\$61.20	\$117.60	\$154.20	\$304.20
Finished	per doz.	21.60	22.80	28.20	36.00	67.20	124.80	165.00	322.20
Nickel-plated	per doz.	25.20	26.40	31.80	40.20	73.20	135.60	180.00	352.20

DOHERTY SELF-CLOSING BIBBS FOR IRON PIPE, WITH SHOULDER



FIG. 582

Size	in.	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1
Finished	per doz.	\$34.20	\$35.40	\$42.00	\$52.20	\$84.00
Nickel-plated	per doz.	40.20	41.40	48.00	60.00	94.20

TELEGRAPH SELF-CLOSING BIBBS FOR IRON PIPE, WITH SHOULDER



FIG. 583

Size	in.	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1
Finished	per doz.	\$24.60	\$25.80	\$32.40	\$42.60	\$74.40
Nickel-plated	per doz.	30.60	31.80	38.40	50.40	84.60

BRASS BIBB COCKS
SCREWED FOR IRON PIPE, WITH SHOULDER
LEVER HANDLE

No. 800 Finished, Plain

**FIG. 584**

No. 800. Rough, for Hose

**FIG. 585**

Size	Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
No. 800, Rough Bibbs, Plain.....	Per Dozen	\$20.40	\$21.00	\$29.40	\$36.00
No. 800, Rough Bibbs for Hose.....	Per Dozen	.....	24.00	32.40	39.00
No. 800, Finished Bibbs, Plain.....	Per Dozen	25.20	25.80	35.40	45.00
No. 800, Finished Bibbs for Hose.....	Per Dozen	.....	28.80	38.40	48.00

Size	Inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
No. 800, Rough Bibbs, Plain.....	Per Dozen	52.80	89.40	149.40	258.00
No. 800, Rough Bibbs for Hose.....	Per Dozen	60.00	100.20	164.40	280.20
No. 800, Finished Bibbs, Plain.....	Per Dozen	64.80	107.40	179.40	300.00
No. 800, Finished Bibbs for Hose.....	Per Dozen	72.00	118.20	194.40	322.20

The above Bibbs, screwed for iron pipe, will be made to order without shoulder, at same list price as above, but at special discount.

FULLER BIBBS FOR IRON PIPE



FIG. 586

WITH SHOULDER

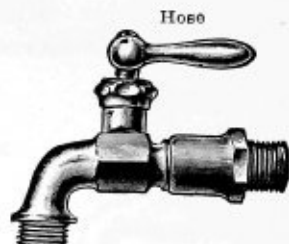


FIG. 587

Size	inches	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{3}{4}$	1
Plain, finished	per dozen	\$23.40	\$27.60	\$38.40	\$72.00
Plain, nickel-plated	per dozen	28.20	32.40	45.00	81.00
Hose, finished	per dozen	27.00	31.20	42.00	80.40
Hose, nickel-plated	per dozen	31.80	36.00	49.20	89.40

BIBB WASHERS



FIG. 588

Size	inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1
Rubber, for cold water	per 100	\$0.80	\$0.90	\$0.95	\$1.00	\$1.10
Red Fibre, for hot water	per 100	.50	.50	.50	.60	.60
Top Packing	per 100	\$1.00				
Sink Suction Stoppers, red or black, diameter, $4\frac{1}{2}$ in.	per dozen	2.50				

FULLER BALLS



FIG. 589

Combination, for hot or cold water. Price.....per doz. \$0.50

Carried in stock in sizes $\frac{1}{2}$ ", $\frac{5}{8}$ " and $\frac{3}{4}$ ".

NO. 90 GAS FITTER'S PROVING PUMP

AND MERCURY COLUMN WITH
ETHER CUP

Length column, 22 inches.

Pump made of heavy seamless brass tubing. Height, 17 inches.

No. 90. List.....each \$13.50

No. 92. Same as above, except has spring test gage with either cup.

Listeach \$15.00



FIG. 590

COLEMAN'S PLUMBERS' PUMPS, CLEANERS, ETC.

No. C500
Suction and Force Pump
Cup Reversed
for Open
Drains

For Sinks



FIG. 591



FIG. 592

No. C510
Flexible Coil Wire
Closet Cleaner



FIG. 593

No. C520
Flexible Coil Wire
Sewer and Pipe
Auger



FIG. 594

No. C506 SUCTION AND FORCE PUMP

A powerful pump with greatest possible suction and force of 100 pounds or more. Will cover any opening up to 5 inches in diameter. Length, 22 inches.

No. C500 Pump with cup. Price.....each \$9.00
No. C505 Cup only. Price.....each 1.25

No. C510 FLEXIBLE COIL WIRE CLOSET CLEANER

Removes obstructions from water closets, drain pipes, etc. The coil goes through any closet; turning handle to the right, obstruction is caught and brought back to the opening by holding down on tube and pulling back on handle.

No. C510 3 foot coil, complete. Price.....each \$5.00
No. C515 6 foot coil, complete. Price.....each 6.00

No. C520 FLEXIBLE COIL WIRE SEWER AND PIPE AUGERS

With these flexible augers you can remove the most obstinate obstruction in vacuum, drain pipes or sewers.

No. C520 $\frac{3}{8}$ inch, 15, 25 and 50 ft. lengths of 14 gauge wire.....per foot \$0.30
No. C525 $\frac{1}{2}$ inch, 15, 25 and 30 ft. lengths of 12 gauge wire.....per foot .35
No. C530 $\frac{3}{4}$ inch, 10, 25 and 50 ft. lengths of 10 gauge wire.....per foot .45

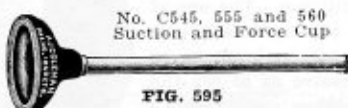


FIG. 595

No. C545, 555 and 560
Suction and Force Cup



FIG. 596

No. C565 and No. C570
Junior Suction and
Force Cup

No. C545 $5\frac{1}{2}$ in. red rubber cups, 18 inch hollow handle.....per dozen \$21.00
No. C555 $5\frac{1}{2}$ in. red rubber cups, 30 inch polished handle.....per dozen 15.00
No. C560 $5\frac{1}{2}$ in. black rubber cups, 30 inch plain handle.....per dozen 12.00
No. C565 $4\frac{1}{2}$ in. black cup, 30 inch plain handle.....per dozen 6.00
No. C570 $4\frac{1}{2}$ in. red cup, 30 inch painted handle.....per dozen 9.00

WHITCOMB MINE COCKS

In mining operations there is a call for a strong valve that will be efficient in every respect, and at the same time be so designed that it cannot be easily injured. Where the ordinary globe valve is used there is danger of the hand wheel and stem being broken off or bent by a fall of rock or slate from the roof, or by being hit by those working around the mine. As soon as the wheel or stem is broken or bent, the valve loses its efficiency.

With the ordinary line of stop cocks it is only a short time before they become loosened and begin to leak. To overcome these defects, this line of valves were designed, and same have met the requirements of the mining operators in every particular.

Each individual valve is tested under 80 lbs. or more air pressure, the valve being submerged under water at the time of test; therefore, we can guarantee that every valve is absolutely tight.

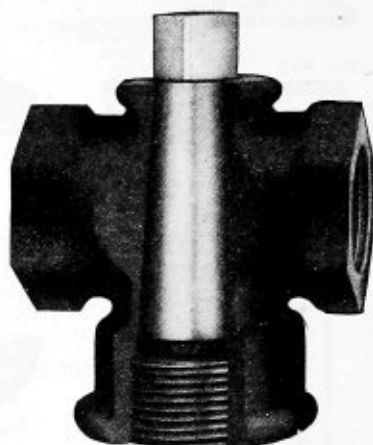


FIG. 598

SCREWED AND FLANGED ENDS

Size, inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Screened ends, each	\$1.90	1.90	1.90	2.65	3.75	6.65	8.75	13.00	27.50	36.50
Flanged ends, each								15.75	30.00	40.00
Keys for above, each	.20	.20	.20	.25	.40	.65	.75	1.00	1.00	1.00



FIG. 599

LOCK VALVES

The Lock Valve was designed especially for use in connection with compressed air coal mining machines. The aim was to limit the use of the compressed air to the men running the machines and to prevent the air from being used to blow out powder smoke or for ventilation. The use of the air for these purposes soon becomes so excessive as to rob the machines of their power.



FIG. 600

Size, inches	1	1 1/4	1 1/2
Screwed ends, each	\$1.90	2.65	3.75
Keys for above, each	.20	.25	.40

CRANE IRON BODY MINE COCKS

FOR COMPRESSED AIR LINES. ALSO USED ON GASOLINE LINES
 SUITABLE FOR 125 POUNDS AIR PRESSURE AND
 175 POUNDS COLD WATER WORKING PRESSURE
 THE SPRING AUTOMATICALLY TAKES UP WEAR

No. 318. Lock-Shield
Triangular Head

FIG. 601

No. 319. Exposed
Square Head

FIG. 602

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	3	4
No. 318.....	each	\$2.25	2.40	2.40	2.65	4.00	6.65	13.00	40.00
No. 319.....	each	2.25	2.40	2.40	2.65	4.00	6.65	13.00	40.00
Triangular Key Wrench.....	each	.20	.20	.20	.25	.40	.65	1.00	5.00
Square Key Wrench.....	each	.20	.20	.20	.25	.40	.65	1.00	5.00

No. 318 prevents tampering—can only be operated with triangular wrench.

CLEANALL AIR GUN

This device is used in foundries, machine shops, mills, garages, etc., wherever compressed air is available. The air is under constant control at all times by the operator, and the desired volume can be obtained by simply pressing button. It is absolutely tight and there is no leakage of air when not in use. Indispensable for blowing dust from motors, machinery, automobile cushions, etc. Used to equal advantage by bench and machine hands for removing chips and filings where it is impossible to reach with a brush. For cleaning molds in foundries it is decidedly more convenient and practical than the hand bellows.

Pipe Connection	Orifice Air Discharge	List Price Each
$\frac{1}{8}$ inch	$\frac{1}{16}$ inch	\$1.50
$\frac{1}{4}$ inch	$\frac{1}{8}$ inch	1.65
$\frac{3}{8}$ inch	$\frac{1}{4}$ inch	1.90
$\frac{1}{2}$ inch	$\frac{3}{8}$ inch	2.50
$\frac{3}{4}$ inch	$\frac{1}{2}$ inch	3.25

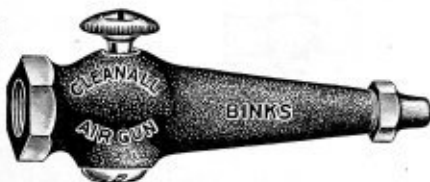


FIG. 603

AIR COCKS

T Handle, Single Thread



FIG. 605

T Handle, Double Thread



FIG. 606

Size .....inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	Size .....inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$
Each	\$0.40	.45	.50	.60	Each	\$0.55	.65	.75	.90

Lever Handle, Single Thread



FIG. 607

Lever Handle, Double Thread



FIG. 608

Size .....inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	Size .....inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$
Each	\$0.55	.60	.65	.75	Each	\$0.70	.80	.90	1.05

T Handle, Bibb Nose



FIG. 609

Lever Handle, Bibb Nose



FIG. 610

Size .....inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	Size .....inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$
Single T....each	\$0.70	.80	.90	1.00	Single T....each	\$0.85	.95	1.05	1.15
Double T....each	\$0.80	1.00	1.10	1.35	Double T....each	\$0.95	1.15	1.25	1.50

T Handle



FIG. 611

Lever Handle



FIG. 612

Size .....inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	Size .....inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$
Each	\$0.75	.85	.95	Each	\$0.90	1.00	1.10

WILLIAMS STEAM CYLINDER COCKS

HEXAGON SHOULDER

Tee Handle
No. 170, Short Shank
No. 458, Long Shank



FIG. 612A

With Lever Handle
and Union
No. 172



FIG. 612B

Lever Handle
No. 171, Short Shank
No. 464, Long Shank



FIG. 612C

Plain
No. 173
For Traction Engines.



FIG. 612D

With Union
No. 675
For Traction Engines.

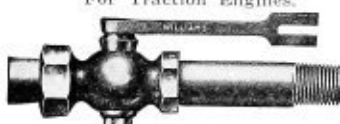


FIG. 612E

These cocks are intended for draining the condensation from the cylinders of pumps and steam engines and are guaranteed for any pressure up to 200 pounds. Nos. 173 and 675 are designed for use on locomotives and traction engines and are fitted with forked levers, which can be attached to a rod and conveniently operated from the cab.

All of the above cocks have straight outlets. Above $\frac{1}{4}$ in. size the unions on Nos. 675 and 172 are made one size smaller than the shank. The illustrations show all cocks with straight outlets, open, when handle is parallel with body.

The traction cocks can be furnished in left or right hand pattern, but straight outlet pattern will always be furnished unless otherwise ordered.

When opened or closed, the levers on the right and left hand patterns, Nos. 173 and 675, stand at an angle of 45 degrees from center line of discharge end of cock.

Number	1	2	3	4	6	
Shank Pipe Thread	Inch	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
No. 170, T. H. Cylinder Cock, short shank.....	each	.75	.85	.95	1.25	2.25
No. 458, T. H. Cylinder Cock, long shank.....	each	.80	1.00	1.25	1.35	2.50
No. 171, L. H. Cylinder Cock, short shank.....	each	.90	1.00	1.10	1.50	2.50
No. 464, L. H. Cylinder Cock, long shank.....	each	1.00	1.15	1.35	1.65	2.75
No. 172, L. H. Cylinder Cock, with union.....	each	1.40	1.50	1.60	1.75	3.00
No. 173, Traction Cylinder Cock.....	each	1.15	1.30	1.40	1.85	...
No. 675, Traction Cylinder Cock, with union.....	each	1.70	1.80	1.95	2.20	...

WILLIAMS BRASS SWIVEL JOINTS & SWIVEL COCKS

ROUGH BODY WITH SPRING KEY

Double Swivel Joint
No. 452, Rough
No. 493, Polished



FIG. 612G

Plain Swivel Joint
No. 506, Rough
No. 222, Polished



FIG. 612F

Swivel Cock
No. 515, Rough
No. 227, Polished



FIG. 612H

These fittings were especially designed for use on piping systems, through which oil or cutting compound is pumped from the bed of the lathe to the tool or material being finished. The keys or plugs in the swivel joint and cock are ground to a smooth and perfect bearing and are guaranteed not to leak and spatter the liquid all over the floor. The compensating spring device at the bottom of the key, automatically takes up the wear between the body and the key, insures a tight joint and as the tension of the spring is uniform, the key can be turned very easily. These joints and cocks are being used by many of the largest lathe and machine tool builders, as their use has demonstrated that a high grade fitting like the Williams will give longer and more satisfactory service than the common gas fixture fittings, which, being poorly constructed, are leaky, troublesome and short lived.

Size	Inch	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$
No. 506, Rough Plain Brass Swivel Joint.....	each	1.70	2.00	2.35
No. 515, Rough Brass Swivel Cock.....	each	2.35	2.85	3.20
No. 452, Rough Brass Double Swing Joint.....	each	2.35	2.85	3.20
No. 222, Polished Plain Brass Swivel Joint.....	each	2.00	2.35	2.85
No. 227, Polished Brass Swivel Cock.....	each	2.70	3.20	3.70
No. 493, Polished Brass Double Swing Joint.....	each	2.70	3.20	3.70

WILLIAMS BRASS SPRING KEY COCKS HEXAGON SHOULDER

Male End
No. 220, Tee Handle
No. 221, Lever Handle



FIG. 613

Male and Female Ends
No. 472, Tee Handle
No. 487, Lever Handle



FIG. 614

Double Male Ends
No. 262, Lever Handle
No. 261, Tee Handle

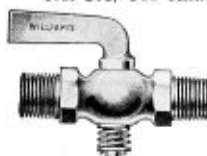


FIG. 615

Bibb Nose, Male End
No. 306, Tee Handle
No. 307, Lever Handle



FIG. 616

Double Female Ends
No. 495, Lever Handle
No. 473, Tee Handle



FIG. 617

Size	inch	1/8	1/4	3/8	1/2
No. 220, Tee Handle and Male End Spring Key Cock.....	\$0.65	.75	1.00	1.30	
No. 221, Lever Handle and Male End Spring Key Cock.....	.70	.90	1.15	1.55	
No. 261, Tee Handle, Double Male End Spring Key Cock.....	.75	1.00	1.35	1.90	
No. 262, Lever Handle, Double Male End Spring Key Cock.....	.85	1.10	1.50	2.00	
No. 306, Tee Handle and Bibb Nose Spring Key Cock.....	.85	.90	1.30	1.65	
No. 307, Lever Handle and Bibb Nose Spring Key Cock.....	.90	1.00	1.50	1.90	
No. 472, Tee Handle, Male and Female Spring Key Cock....	.80	1.05	...	...	
No. 487, Lever Handle, Male and Female Spring Key Cock....	.90	1.15	...	...	
No. 473, Tee Handle, Double Female Spring Key Cock.....	.80	1.05	...	...	
No. 495, Lever Handle, Double Female Spring Key Cock....	.90	1.15	...	...	

WILLIAMS DRAIN AND GASOLINE COCKS WITH SPRING KEY

Crank Case Drain
Cock
No. 124, Lever Handle
No. 232, Tee Handle



FIG. 618

The Gasoline Cock, No. 193, is ordinarily used for controlling supply from the tank to the carburetor. It is substantially made, key is fitted with spring device and the bottom of the cock is notched to engage lugs on a washer above the spring so that the key will not jar from the position in which it is set. Unless otherwise ordered, these cocks will be furnished with Brazing Union connection for 3/8-inch O. D. Tubing.

Gasoline Cock
With
Brazing Union
No. 193

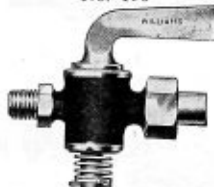


FIG. 619

No. 124 has a large opening through the key and is used for draining radiators, crank and transmission cases. When closed, the key of this cock is parallel with the body.

Size	inch	1/8	1/4	3/8	1/2
No. 193, Gasoline Cock, with 3/8-inch Brazing Union, each	\$1.40	1.50	...	...	...
No. 124, Drain Cock, Lever Handle	each	1.25	1.30	1.50	2.10
No. 232, Drain Cock, Tee Handle.....	each	1.10	1.15	1.35	1.80

DETROIT RADIATOR VALVES

No. 72. Screw Stem Angle
For Steam



FIG. 620

No. 32 Right Hand
No. 37 Left Hand
Screw Stem Corner
For Steam



FIG. 621

No. 57. Screw Stem Globe
For Steam

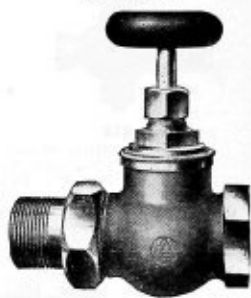


FIG. 622

No. 373. Non-Rising
Stem Gate
For Steam or Hot Water



FIG. 623

No. 101. Bonnetless Quick-
Opening Angle for Hot
Water



FIG. 624

No. 132. Union Elbow



FIG. 625

Detroit Radiator Valves and Union Elbows are finished with rough body and polished trimmings, nickel plated all over.

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
No. 72	each	\$3.15	3.80	4.75	6.40	8.10	13.10
No. 32 & 37, Right or Left Hand	each	3.45	4.20	5.25	7.05	8.95	14.45
No. 57	each	3.15	3.80	4.75	6.40	8.10	13.10
No. 373	each	3.65	4.25	5.20	6.60	9.00	12.80
No. 101	each	2.40	2.85	3.65	5.05	7.10	10.85
No. 132 Union Elbow	each	1.75	2.00	2.50	3.20	4.00	7.00

DETROIT PACKLESS RADIATOR VALVES

Sectional View



FIG. 626

No. 260. Angle
For Steam

FIG. 627

No. 262
Right Hand For Steam

FIG. 628

No. 263
Left Hand For Steam

FIG. 629

The Detroit Packless Valve fulfills the need for a radiator valve that will not leak around the stem nor need repacking. It does away with the trouble and expense of leakage to which ordinary valves are subject, and its construction makes it perfectly adapted also for use on vacuum systems where tightness is essential.

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
No. 260	each	\$3.15	3.80	4.75	6.40	8.10	13.10
No. 262, R. H.	each	3.45	4.20	5.25	7.05	8.95	14.45
No. 263, L. H.	each	3.45	4.20	5.25	7.05	8.95	14.45

Finished with rough body and polished trimmings, plated all over.

No. 266. Gate With Union
For Steam

FIG. 630

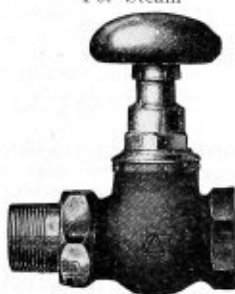
No. 280. Globe With Union
For Steam

FIG. 631

No. 290. Quick-Opening
Hot Water With Union

FIG. 632

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
No. 266	each	\$3.15	3.80	4.75	6.40	8.10	13.10
No. 280	each	3.15	3.80	4.75	6.40	8.10	13.10
No. 290	each	2.40	2.85	3.65	5.05	7.10	10.80

AUTOMATIC AIR VALVES

NON-ADJUSTABLE

Norwall Valve
No. 559

FIG. 633

The operation of these two valves is the same; structurally, the Norwall is larger and heavier than the Allen.

No. 559, Norwall Valve... List Price, ea. \$1.30
No. 560, Allen Valve.... List Price, ea. 1.00

Allen Valve
No. 560

FIG. 634

No. 561
Valve Open

FIG. 635

NORWALL SIPHON AIR VALVES

NON-ADJUSTABLE

Guaranteed for Five Years.

The Norwall Siphon Air Valve vents the Steam system as long as a vestige of air remains. It automatically opens to let out the smallest air pocket, and closes against the escape of steam or water. Absolutely non-adjustable and cannot be tampered with. The most sensitive, dependable air valve made. All metal, no perishable parts.

A sealed metal float is contained in the inner or float chamber, which is connected to an outer or air chamber by a small hole at the bottom. Water of condensation is retained in the well formed by the location of the radiator connection at the top of the valve.

When steam reaches the valve the air in the outer chamber expands, forcing the water into the inner chamber, raising the float and closing the valve; when the valve cools this air contracts, drawing the water from the float chamber into the air chamber. The float then drops and opens the valve. This action is instantaneous.

On "water logged" radiators the valve closes tight against the escape of water, but the instant the water in the radiator falls away, the siphon automatically discharges the surplus water in the valve back into the radiator, and the valve recommences venting.

Should dirt interfere with the perfect operation of the valve, the bottom cap is so fitted that it can be easily removed and the valve cleaned, making it as good as new.

This valve can be furnished equipped with an attachment to prevent it from being removed from the radiator by hand. Weight packed 3 3/4 pounds per dozen.
No. 561..... List Price, each, \$1.70

JENKINS AUTOMATIC AIR VALVES



FIG. 636

Cut shows the air valve in its simplest form. The drip cup is generally used in connection therewith, and is screwed to the outlet end of the valve. This will receive any water of condensation which may pass through the valve and allow it to evaporate.

Air Valve, $\frac{1}{2}$ inch, finished and nickel plated.....	Per dozen	\$7.50
Air Valve, $\frac{3}{4}$ inch, finished and nickel plated.....	Per dozen	7.50
Drip Cup, finished and nickel plated.....	Per dozen	2.00

"PECO" CAST BASE FLOAT VALVE

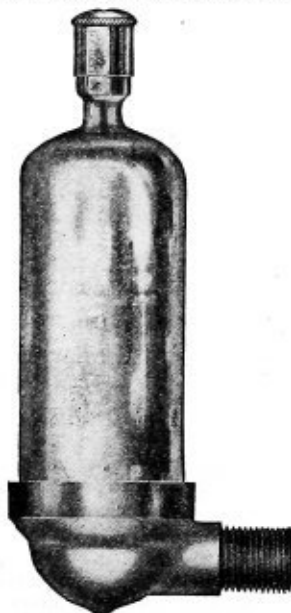


FIG. 637

Illustration Shows Valve Full Size.

The "Peco" is an entirely new float automatic air valve made of the best materials.

It has a special expansion rod which is very sensitive and indestructible.

Adjustment is made at factory and valve can be regulated independently of the packing gland. Automatically opens to permit the discharge of cold air—closes against water by flotation, and against steam by expansion.

Price.....Per dozen, \$12.00

COMPRESSION RADIATOR VALVES

NO. 3



FIG. 638

Threaded for iron pipe, size $\frac{1}{8}$ inch.

Price, nickel plated.....\$0.70

Threaded for iron pipe, size $\frac{1}{4}$ inch.

Price, nickel plated.....\$0.75

NO. 4



FIG. 639

Threaded for iron pipe, size $\frac{1}{8}$ inch.

Price, nickel plated.....\$0.60

Threaded for iron pipe, size $\frac{1}{4}$ inch.

Price, nickel plated.....\$0.65

Two keys to each dozen. Extra keys,
6 cents each, net.

NO. 5



FIG. 640

Threaded for iron pipe, size $\frac{1}{8}$ inch.

Price, nickel plated.....\$0.45

LOW PRESSURE NON-ADJUSTABLE POP
SAFETY VALVES

FOR STEAM HEATING BOILERS

No. 1165



FIG. 641

These Valves Conform With the Requirements of the
A. S. M. E. Boiler Code.

Set at 15 Pounds Pressure.

These Valves are made of malleable iron with brass trimmings. Special attention has been paid to the bases, which are rigid and provide ample clearance for the tools, when Valves are installed in difficult places.

These Valves will be furnished locked up in such a way that the popping pressure cannot be changed from the original set pressure.

In localities where Boiler Inspector Seal is required and so specified we will furnish these Valves drilled in such a way that wire and seal can be efficiently attached.

Size	inches	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3
Price	each	\$6.00	6.75	8.25	11.25	26.00	37.50

MINNEAPOLIS HEAT REGULATOR

GRAVITY MOTOR OUTFITS

Model No. 39
Thermostat

FIG. 642

The Model 39 is furnished with one day clock attachment, which allows a lower temperature at night and at any set hour in the morning will automatically turn the indicator to seventy degrees. The thermostat is small and inconspicuous, and is an ornament to any room.

This model of thermostat is furnished with gravity motor only.

Model No. 39
Gravity Motor

FIG. 643

Price, No. 39, with one-day time attachment and gravity motor.....\$39.00

SPRING AND ELECTRIC MOTOR OUTFITS

Model No. 47
Thermostat

FIG. 644

No. 47 has a one-day time attachment; No. 55 an eight-day duplex attachment that changes at any hour night and morning; No. 60 with high grade solid brass case, eight-day clock.

Spring motors are enclosed in dust and moisture proof case and are easily wound by crank key. Direct current motors are operated by four dry cell batteries. Alternating current motors are furnished with transformers. All complete, ready to install.

Standard
Spring Motor

FIG. 645

Description	Spring Motor Outfit		D. C. Motor Outfit		A. C. Motor Outfit	
	Number	Price	Number	Price	Number	Price
No time attachment.....	40	\$40.00	40 D. C.	\$50.00	40 A. C.	\$60.00
One-day time.....	47	47.00	47 D. C.	57.00	47 A. C.	67.00
Eight-day duplex.....	55	55.00	55 D. C.	65.00	55 A. C.	75.00
Eight-day time.....	60	60.00	60 D. C.	70.00	60 A. C.	80.00
Hot Water tank and boiler.....	65	65.00	65 D. C.	75.00	65 A. C.	85.00



FIG. 646

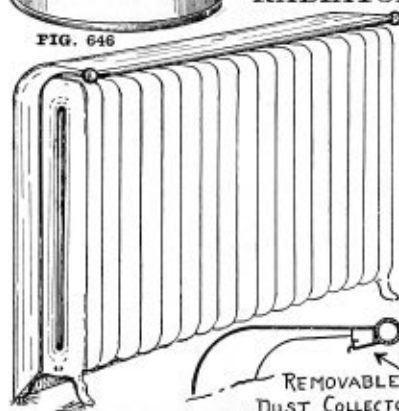


FIG. 647

"BESTOVALL" RADIATOR BRONZE

Bestovall Gold and Aluminum Plating Radiator Bronze has a covering capacity of 175 square feet the pound. Use 4 lbs. of bronze to 1 gallon of liquid.

Gold. Price.....per pound \$2.40
Aluminum. Price.....per pound 2.40

"BESTOVALL" BRONZING LIQUID

Size, Cans.....	1 Gal.	½ Gal.	1 Q. t.
Per gallon	\$2.00	1.25	0.75

RADIATOR SHIELDS

Can be readily fitted to radiators of all varying constructions, as the brackets can be quickly shifted to connect with any make of radiator. They do not interfere with the operation of the radiator valves or air valves, side piece being only 2 inches wide.

NOTE: One pair of brackets and one pair of hooks furnished with each shield.

Bottom loops on shield are used only to keep shield proper distance from the radiator.

No hooks are furnished or necessary for bottom loops.

No. 26 gauge material regularly furnished.

In ordering, indicate—(1) whether single, two, three, four column or window radiation; (2) name and height of radiator; (3) number and length of sections.

Orders not subject to cancellation.

Height of Radiator Inches	26 or lower 5 Sec. or less	32 and 38 5 Sec. or less	41 5 Sec. or less	
Shields from Black Sheets	\$3.00	\$3.20	\$3.40	Radiators larger than 5 sec. add 10c for each additional section.
Shields from Galvanized Sheets	3.60	3.80	4.00	Radiators larger than 5 sec. add 12c for each additional section.
Brass, having Galvanized Iron Backs	17.00	17.40	17.60	Radiators larger than 5 sec. add 30c for each additional section.
All Brass	18.00	19.00	19.60	Radiators larger than 5 sec. add 60c for each additional section.
Black, painted or bronzed plain colors.....	4.00	4.20	4.40	Radiators larger than 5 sec. add 30c for each additional section.
Galvanized, painted or bronzed, plain colors....	4.60	4.80	5.00	Radiators larger than 5 sec. add 32c for each additional section.

Add \$2.00 to above list prices for vapor pan.

Shields painted to order or to match decorations at extra charge.

STEAM AND WATER RADIATORS

One Column

Two Column



FIG. 648



FIG. 649

Unless otherwise specified, all one or two column radiators will be tapped as follows:

STEAM—ONE PIPE

24 square feet and under.....1 in.
Above 24 but not exceeding 60.....1½ in.
Above 60 but not exceeding 100.....1½ in.
Above 100 square feet.....2 in.

TWO PIPE

48 square feet and under.....1 x ¾ in.
Above 48 but not exceeding 96.....1¼ x 1 in.
Above 96 square feet.....1½ x 1¼ in.

WATER

TAPPED FOR SUPPLY AND RETURN

40 square feet and under.....1 in.
Above 40 but not exceeding 72.....1½ in.
Above 72 square feet.....1½ in.

Width of section, 7¼ inches. Width of legs, 8¼ inches.
Distance from floor to center of opening, 4½ inches.

Made with 2 inch heavy tapered zinc coated nipples and tested 80 pounds cold water pressure.

LIST OF SIZES, ONE COLUMN

LIST OF SIZES, TWO COLUMN

Number of Sections	Length, Inches	HEATING SURFACE						HEATING SURFACE					
		38 inches high 3 sq. feet per sect.	32 inches high 2½ sq. feet per sect.	26 inches high 2 sq. feet per sect.	20 inches high 1½ sq. feet per sect.	14 inches high 1 sq. feet per sect.	45 inches high 5 sq. feet per sect.	38 inches high 4 sq. feet per sect.	32 inches high 3½ sq. feet per sect.	26 inches high 2½ sq. feet per sect.	20 inches high 2 sq. feet per sect.	14 inches high 1½ sq. feet per sect.	8 inches high 1 sq. feet per sect.
2	5	6	5	4	3		10	8	6½	5½	4½	3	2
3	7½	9	7½	6	4½		15	12	10	8	7	6	5
4	10	12	10	8	6		20	16	13½	10½	9½	8	7
5	12½	15	12½	10	7½		25	20	16½	13½	11½	10	9
6	15	18	15	12	9		30	24	20	16	14	12	11
7	17½	21	17½	14	10½		35	28	23½	18½	16½	14	13
8	20	24	20	16	12		40	32	26½	21½	18½	16	15
9	22½	27	22½	18	13½		45	36	30	24	21	18	17
10	25	30	25	20	15		50	40	33½	26½	23½	20	19
11	27½	33	27½	22	16½		55	44	36½	29½	25½	22	21
12	30	36	30	24	18		60	48	40	32	28	24	23
13	32½	39	32½	26	19½		65	52	43½	34½	30½	26	25
14	35	42	35	28	21		70	56	46½	37½	32½	28	27
15	37½	45	37½	30	22½		75	60	50	40	35	30	29
16	40	48	40	32	24		80	64	53½	42½	37½	32	31
17	42½	51	42½	34	25½		85	68	56½	45½	39½	34	33
18	45	54	45	36	27		90	72	60	48	42	36	35
19	47½	57	47½	38	28½		95	76	63½	50½	44½	38	37
20	50	60	50	40	30		100	80	66½	53½	46½	40	39
21	52½	63	52½	42	31½		105	84	70	56	49	42	41
22	55	66	55	44	33		110	88	73½	58½	51½	44	43
23	57½	69	57½	46	34½		115	92	76½	61½	53½	46	45
24	60	72	60	48	36		120	96	80	64	56	48	47
25	62½	75	62½	50	37½		125	100	83½	66½	58½	50	49
26	65	78	65	52	39		130	104	86½	69½	60½	52	51
27	67½	81	67½	54	40½		135	108	90	72	63	54	53
28	70	84	70	56	42		140	112	93½	74½	65½	56	55
29	72½	87	72½	58	43½		145	116	96½	77½	67½	58	57
30	75	90	75	60	45		150	120	100	80	70	60	59
31	77½	93	77½	62	46½		155	124	103½	82½	72½	62	61
32	80	96	80	64	48		160	128	106½	85½	74½	64	63

In estimating length of radiator, allow ½ inch for each bushing.

Height	inches	45	38	32	26	23	22	20	18	15
Price	per sq. ft.	\$0.70	.70	.76	.84	.88	.90	.96	1.00	1.06

STEAM AND HOT WATER RADIATORS



FIG. 650

FIG. 651

Unless otherwise specified, all Three Column Radiators will be tapped as follows:

STEAM ONE PIPE	27½ square feet and under.....	1 in.
	Above 27½ but not exceeding 60.....	1½ in.
TWO PIPE	Above 60 but not exceeding 90.....	2 in.
	Above 90 square feet.....	2½ in.
WATER Tapped for Supply and Return	49½ square feet and under.....	1 in.
	Above 49½ but not exceeding 90.....	1½ in.
WATER Tapped for Supply and Return	Above 90 square feet.....	1½ in.
	Above 38½ but not exceeding 71½.....	1½ in.
Distance from floor to center of opening, 4½ inches.	Above 71½ square feet.....	1½ in.
	Width of section, 9½ in. Width of legs, 9½ in.	
Made with 2 inch heavy tapered zinc coated nipples and tested 80 pounds cold water pressure.		

Unless otherwise specified, all Four Column Radiators will be tapped as follows:

STEAM ONE PIPE	24 square feet and under.....	1 in.
	Above 24 but not exceeding 60.....	1½ in.
TWO PIPE	Above 60 but not exceeding 100.....	1½ in.
	Above 100 square feet.....	2 in.
WATER Tapped for Supply and Return	48 square feet and under.....	1 in.
	Above 48 but not exceeding 96.....	1½ in.
WATER Tapped for Supply and Return	Above 96 square feet.....	1½ in.
	Above 38½ but not exceeding 71½.....	1 in.
Distance from floor to center of opening, 4½ inches.	Above 71½ square feet.....	1½ in.
	Width of section, 11½ in. Width of legs, 12½ in.	
Made with 2 inch heavy tapered zinc coated nipples and tested 80 pounds cold water pressure.		

Distance from floor to center of opening, 4½ inches.
Made with 2 inch heavy tapered zinc coated nipples and tested 80 pounds cold water pressure.

LIST SIZES, THREE COLUMN										LIST SIZES, FOUR COLUMN									
Number of Sections		Length, Inches		HEATING SURFACE								HEATING SURFACE—SQUARE FEET							
				41 inches height, 6½ sq. ft. per sect.	45 inches height, 9 sq. ft. per sect.	49 inches height, 11½ sq. ft. per sect.	53 inches height, 14 sq. ft. per sect.	57 inches height, 16½ sq. ft. per sect.	61 inches height, 19 sq. ft. per sect.	41 inches height, 6½ sq. ft. per sect.	45 inches height, 9 sq. ft. per sect.	49 inches height, 11½ sq. ft. per sect.	53 inches height, 14 sq. ft. per sect.	57 inches height, 16½ sq. ft. per sect.	61 inches height, 19 sq. ft. per sect.	65 inches height, 21½ sq. ft. per sect.	69 inches height, 24 sq. ft. per sect.	73 inches height, 26½ sq. ft. per sect.	77 inches height, 29 sq. ft. per sect.
2	5	13	11	9	7½	5½	18	16	13½	18	16	13½	10½	8	7	6	5	4	3
3	7½	19½	16½	13½	11½	8½	27	24	20	27	24	20	16	12	10½	9	8	7	6
4	10	26	22	18	15	11	36	32	26½	36	32	26½	21½	16	14	12	11	10	9
5	12½	32½	27½	22½	18½	13½	45	40	33½	45	40	33½	26½	20	17½	15	14	13	12
6	15	39	33	27	22½	16½	54	48	40	54	48	40	32	24	21	18	17	16	15
7	17½	45½	38½	31½	26½	19½	63	56	46½	63	56	46½	37½	28	24½	21	20	19	18
8	20	52	44	36	30	22	72	64	53½	72	64	53½	42½	32	28	24	23	22	21
9	22½	58½	49½	40½	33½	24½	81	72	60	81	72	60	48	36	31½	27	26	25	24
10	25	65	55	45	37½	27½	90	80	66½	90	80	66½	53½	40	35	30	29	28	27
11	27½	71½	60½	49½	41½	30½	99	88	73½	99	88	73½	58½	44	38½	33	32	31	30
12	30	78	66	54	45	33	108	96	80	108	96	80	64	48	42	36	35	34	33
13	32½	84½	71½	58½	48½	35½	117	104	86½	117	104	86½	69½	52	45½	39	38	37	36
14	35	91	77	63	52½	38½	126	112	93½	126	112	93½	74½	56	49	42	41	40	39
15	37½	97½	82½	67½	56½	41½	135	120	100	135	120	100	80	60	52½	45	44	43	42
16	40	104	88	72	60	44	144	128	106½	144	128	106½	85½	64	56	48	47	46	45
17	42½	110½	93½	76½	63½	46½	153	136	113½	153	136	113½	90½	68	59½	51	50	49	48
18	45	117	99	81	67½	49½	162	144	120	162	144	120	96	72	63	54	53	52	51
19	47½	123½	104½	85½	71½	52½	171	152	126½	171	152	126½	101½	76	66½	57	56	55	54
20	50	130	110	90	75	55	180	160	133½	180	160	133½	106½	80	70	60	59	58	57
21	52½	136½	115½	94½	78½	57½	189	168	140	189	168	140	112	84	73	63	62	61	60
22	55	143	121	99	82½	60½	198	176	146½	198	176	146½	117½	88	77	66	65	64	63
23	57½	149½	126½	103½	86½	63½	207	184	153½	207	184	153½	122½	92	80½	69	68	67	66
24	60	156	132	108	90	66	216	192	160	216	192	160	128	96	84	72	71	70	69
25	62½	162½	137½	112½	93½	68½	225	200	166½	225	200	166½	133½	100	87½	75	74	73	72
26	65	169	143	117	97½	71½	234	208	173½	234	208	173½	138½	104	91	78	77	76	75
27	67½	175½	148½	121½	101½	74½	243	216	180	243	216	180	144	108	94½	81	80	79	78
28	70	182	154	126	105	77	252	224	186½	252	224	186½	149½	112	98	84	83	82	81
29	72½	188½	159½	130½	108½	79½	261	232	193½	261	232	193½	154½	116	101½	87	86	85	84
30	75	195	165	135	112½	82½	270	240	200	270	240	200	160	120	105	90	89	88	87
31	77½	201½	170½	139½	116½	85½	279	248	206½	279	248	206½	165½	124	108½	93	92	91	90
32	80	208	176	144	120	88	288	256	213½	288	256	213½	170½	128	112	96	95	94	93

In estimating length of radiator, allow ½ inch for each bushing.

Height	inches	45	38	32	26	23	22	20	18	15
Price	per sq. ft.	\$0.70	.70	.76	.84	.88	.90	.96	1.00	1.06

WINDOW RADIATORS FOR STEAM OR WATER



FIG. 652

No. Sec- tions	L'gh. Inches	20 Inches High 5	18 Inches High 4½	16 Inches High 4	14 Inches High 3½	No. Sec- tions	L'gh. Inches	20 Inches High 5	18 Inches High 4½	16 Inches High 4	14 Inches High 3½
		Sq. Ft. Per Sec- tion	Sq. Ft. Per Sec- tion	Sq. Ft. Per Sec- tion	Sq. Ft. Per Sec- tion			Sq. Ft. Per Sec- tion	Sq. Ft. Per Sec- tion	Sq. Ft. Per Sec- tion	Sq. Ft. Per Sec- tion
2	6	10	9	8	7	18	54	90	81	72	63
3	9	15	13½	12	10½	19	57	95	85½	76	66½
4	12	20	18	16	14	20	60	100	90	80	70
5	15	25	22½	20	17½	21	63	105	94½	84	73½
6	18	30	27	24	21	22	66	110	99	88	77
7	21	35	31½	28	24½	23	69	115	103½	92	80½
8	24	40	36	32	28	24	72	120	108	96	84
9	27	45	40½	36	31½	25	75	125	112½	100	87½
10	30	50	45	40	35	26	78	130	117	104	91
11	33	55	49½	44	38½	27	81	135	121½	108	94½
12	36	60	54	48	42	28	84	140	126	112	98
13	39	65	58½	52	45½	29	87	145	130½	116	101½
14	42	70	63	56	49	30	90	150	135	120	105
15	45	75	67½	60	52½	31	93	155	139½	124	108½
16	48	80	72	64	56	32	96	160	144	128	112
17	51	85	76½	68	59½						

Width of section is 12¾ inches.

Width of legs, 13 inches.

Unless otherwise specified, all radiators will be tapped as follows:

STEAM—ONE PIPE

Up to and including 25 feet.....	1	inch
From 25 to 50 feet.....	1½	inch
From 60 to 100 feet.....	1½	inch

HOT WATER—TWO PIPE

Up to and including 40 feet.....	1	inch
From 40 to 75 feet.....	1½	inch
Above 75 feet.....	1½	inch

STEAM—TWO PIPE

Up to and including 40 feet.....	1	inch
From 50 to 95 feet.....	1½x1	inch
Above 95 feet.....	1½x1½	inch

Distance from floor to center of opening is 3 inches.

In estimating length of radiator allow ½ inch for each bushing.

Height	inches	20	18	16	14
Price.....	Per square foot	\$0.96	1.00	1.04	1.08

RICHMOND SECTIONAL STEAM BOILERS

WATER BASE



Fig. 653

No. of Boiler	Rating Sq. Ft.	List Price	Average Fire Pot Inches	Smoke Collar Inches	No. of Sections	Height Water Line Inches	Height to Top of Supply Outlet in.	Total Length with Smoke Box Inches	Total Width Inches	Size Supply Inches	Size Return Inches
204-S	525	\$ 238.00	22 x 19	10	4	46	61	34	40	1-3	2-3
205-S	675	303.00	22 x 25	10	5	46	61	40	40	2-3	2-3
206-S	850	355.00	22 x 31	10	6	46	61	46	40	2-3	2-3
207-S	1,000	400.00	22 x 37	10	7	46	61	52	40	2-3	2-3
208-S	1,150	445.00	22 x 43	10	8	46	61	58	40	2-3	2-3
305-S	1,200	460.00	28 x 28	12	5	50	68	45	46	1-4	2-3
306-S	1,400	520.00	28 x 35	12	6	50	68	52	46	2-4	4-3
307-S	1,625	587.00	28 x 42	12	7	50	68	59	46	2-4	4-3
308-S	1,900	670.00	28 x 49	12	8	50	68	66	46	2-4	4-3
309-S	2,100	730.00	28 x 55	12	9	50	68	73	46	2-4	4-3
42- 6-S	2,400	810.00	42 x 35	15	6	56½	78	52	64	2-5	3-4
42- 7-S	2,800	904.00	42 x 42	15	7	56½	78	59	64	2-5	3-4
42- 8-S	3,350	1,014.00	42 x 49	15	8	56½	78	66	64	2-6	4-4
42- 9-S	3,900	1,125.00	42 x 55	15	9	56½	78	73	64	2-6	4-4
42-10-S	4,400	1,224.00	42 x 62	18	10	56½	78	80	64	2-6	4-4
42-11-S	4,900	1,324.00	42 x 69	18	11	56½	78	87	64	2-6	4-4
42-12-S	5,400	1,424.00	42 x 76	18	12	56½	78	94	64	2-6	4-4
537-S	4,000	1,144.00	51 x 43	15x26½	7	....	..	67	..	2-6	4-4
538-S	4,600	1,264.00	51 x 50	15x26½	8	....	..	74	..	2-6	4-4
539-S	5,150	1,374.00	51 x 57	15x26½	9	....	..	81	..	2-6	4-4
5310-S	5,700	1,484.00	51 x 64	15x26½	10	....	..	88	..	3-6	4-4
5311-S	6,400	1,624.00	51 x 71	15x26½	11	....	..	95	..	3-6	4-4
5312-S	7,200	1,784.00	51 x 78	15x26½	12	....	..	102	..	3-6	4-4
5313-S	7,950	1,934.00	51 x 85	15x26½	13	....	..	109	..	3-6	4-4
5314-S	8,450	2,034.00	51 x 92	15x26½	14	....	..	116	..	3-6	4-4
5315-S	8,950	2,134.00	51 x 99	15x26½	15	....	..	123	..	2-8	4-6
5316-S	9,450	2,234.00	51x106	15x26½	16	....	..	130	..	2-8	4-6

"RICHMOND" ROUND STEAM BOILERS

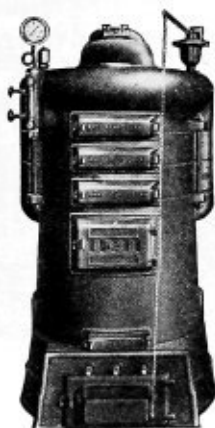


FIG. 654

No. of Boiler	Rating Sq. Ft.	List Price	Fire Pot Dia. Inches	Water Line Inches	Height Inches	Smoke Collar Inches	Supply Tappings Inches	Return Tappings Inches
1317	300	\$150.00	17	41	53 $\frac{1}{8}$	7	1-2 $\frac{1}{2}$	2-2
1417	325	158.00	17	46	58 $\frac{1}{8}$	7	1-2 $\frac{1}{2}$	2-2
1517	350	167.00	17	51	63 $\frac{1}{8}$	7	1-2 $\frac{1}{2}$	2-2
1320	425	200.00	20	41 $\frac{1}{2}$	53 $\frac{1}{2}$	8	1-2 $\frac{1}{2}$	2-2 $\frac{1}{2}$
1420	475	213.00	20	46 $\frac{1}{2}$	58 $\frac{1}{2}$	8	1-2 $\frac{1}{2}$	2-2 $\frac{1}{2}$
1520	500	220.00	20	51 $\frac{1}{2}$	63 $\frac{1}{2}$	8	1-2 $\frac{1}{2}$	2-2 $\frac{1}{2}$
1323	575	240.00	23	44 $\frac{1}{4}$	57 $\frac{3}{4}$	9	1-3	2-3
1423	625	278.00	23	50	63 $\frac{1}{2}$	9	1-3	2-3
1523	675	293.00	23	55 $\frac{3}{4}$	69 $\frac{1}{4}$	9	1-3	2-3
1326	750	317.00	26	46	61 $\frac{1}{4}$	10	1-3 $\frac{1}{2}$	2-3 $\frac{1}{2}$
1426	825	339.00	26	52 $\frac{1}{2}$	67 $\frac{1}{4}$	10	1-3 $\frac{1}{2}$	2-3 $\frac{1}{2}$
1526	900	361.00	26	59	74 $\frac{1}{4}$	10	1-3 $\frac{1}{2}$	2-3 $\frac{1}{2}$
1329	1000	390.00	29	47 $\frac{1}{2}$	64	10	1-4	2-3 $\frac{1}{2}$
1429	1100	419.00	29	53 $\frac{3}{4}$	70 $\frac{1}{4}$	10	1-4	2-3 $\frac{1}{2}$
1529	1200	449.00	29	60	76 $\frac{1}{2}$	10	1-4	2-3 $\frac{1}{2}$

RICHMOND SECTIONAL WATER BOILERS

WATER BASE

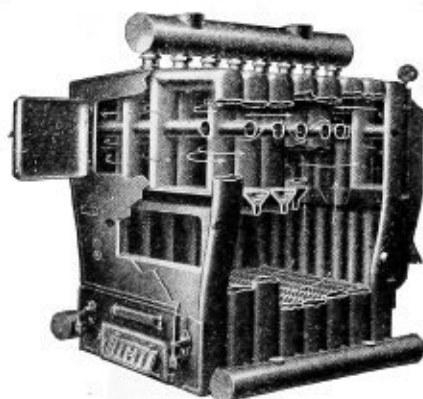


FIG. 655

No. of Boiler	Rating Sq. Ft.	List Price	Average Fire Pot Inches	Smoke Collar Inches	No. of Sections	Height to Top of Supply Outlet Inches	Total Length with Smoke Box Inches	Total Width Inches	Size Supply Inches	Size Return Inches
204-W	850	\$ 228.00	22 x 19	10	4	61	34	40	1-3	2-3
205-W	1,100	293.00	22 x 25	10	5	61	40	40	2-3	2-3
206-W	1,400	345.00	22 x 31	10	6	61	46	40	2-3	2-3
207-W	1,650	390.00	22 x 37	10	7	61	52	40	2-3	2-3
208-W	1,900	435.00	22 x 43	10	8	61	58	40	2-3	2-3
305-W	2,000	450.00	28 x 28	12	5	68	45	46	1-4	2-3
306-W	2,350	510.00	28 x 35	12	6	68	52	46	2-4	4-3
307-W	2,675	577.00	28 x 42	12	7	68	59	46	2-4	4-3
308-W	3,150	660.00	28 x 49	12	8	68	66	46	2-4	4-3
309-W	3,450	720.00	28 x 55	12	9	68	73	46	2-4	4-3
42- 6-W	3,975	790.00	42 x 35	15	6	78	52	64	2-5	3-4
42- 7-W	4,625	884.00	42 x 42	15	7	78	59	64	2-5	3-4
42- 8-W	5,525	994.00	42 x 49	15	8	78	66	64	2-6	4-4
42- 9-W	6,450	1,105.00	42 x 55	15	9	78	73	64	2-6	4-4
42-10-W	7,250	1,204.00	42 x 62	18	10	78	80	64	2-6	4-4
42-11-W	8,100	1,304.00	42 x 69	18	11	78	87	64	2-6	4-4
42-12-W	8,900	1,404.00	42 x 76	18	12	78	94	64	2-6	4-4
537-W	6,600	1,124.00	51 x 43	15x26½	7	..	67	..	2-6	2-6
538-W	7,600	1,244.00	51 x 50	15x26½	8	..	74	..	2-6	2-6
539-W	8,475	1,354.00	51 x 57	15x26½	9	..	81	..	2-6	2-6
5310-W	9,375	1,464.00	51 x 64	15x26½	10	..	88	..	3-6	2-6
5311-W	10,575	1,604.00	51 x 71	15x26½	11	..	95	..	3-6	2-6
5312-W	11,875	1,764.00	51 x 78	15x26½	12	..	102	..	3-6	2-6
5313-W	13,100	1,914.00	51 x 85	15x26½	13	..	109	..	3-6	2-6
5314-W	13,900	2,014.00	51 x 92	15x26½	14	..	116	..	3-6	2-6
5315-W	14,800	2,114.00	51 x 99	15x26½	15	..	123	..	2-8	4-6
5316-W	15,600	2,214.00	51x106	15x26½	16	..	130	..	2-8	4-6

RICHMOND ROUND WATER BOILERS



FIG. 656

No. of Boiler	Rating Sq. Ft.	List Price	Fire Pot Diameter Inches	Height Inches	Smoke Collar Inches	Supply Tappings Inches	Return Tappings Inches
2317	500	\$141.00	17	49	7	2-2	2-2
2417	550	154.00	17	54	7	2-2	2-2
2517	575	158.00	17	59	7	2-2	2-2
2320	700	191.00	20	49½	8	2-2½	2-2½
2420	775	204.00	20	54½	8	2-2½	2-2½
2520	825	211.00	20	59½	8	2-2½	2-2½
2323	950	230.00	23	53	9	2-3	2-3
2423	1025	270.00	23	58¾	9	2-3	2-3
2523	1100	283.00	23	64½	9	2-3	2-3
2326	1250	307.00	26	56¾	10	2-3	2-3
2426	1375	329.00	26	62¾	10	2-3	2-3
2526	1500	351.00	26	69¼	10	2-3	2-3
2329	1650	380.00	29	58¼	10	2-3½	2-3½
2429	1825	409.00	29	64½	10	2-3½	2-3½
2529	2000	439.00	29	70¾	10	2-3½	2-3½

IDEAL WATER AND LAUNDRY HEATERS

No. 07 Ideal Premier

No. 10 Ideal Arco



FIG. 657



FIG. 658

No. 1-D Ideal Laundry



FIG. 659

DATA AND LIST PRICES

No.	Style of Grate	Nom. Diam. Grate, Inches	Grate Area, Sq. Ft.	Outlets, Inches	*Nominal Ratings	List Prices
01	Slide	10	.59	1-1½	56	\$26.50
02	"	10	.54	1-1½	93	34.00
03	"	10	.59	1-1½	144	37.00
04	Rocking	12	.80	1-1½	192	57.00
†05	"	12	.80	1-1½	210	73.00
06	"	15	1.23	1-2	384	83.00
†07	"	15	1.23	1-2	426	102.00
08	"	18	1.92	1-2	600	114.00
†09	"	18	1.92	3-2	660	142.00
Arco 10	"	10	.54	1-1½	81	33.00
" 12	"	12	.80	1-1½	148	37.00
" 15	"	15	1.23	1-1½	242	50.00
Laundry 1-D	Slide	10	.54	1-1	100	39.50
Invincible	"	8	.35	1-1	40	22.50

*Gallons per hour per 25 degree rise on 8-hour firing period, with hard coal.

†Equipped with Dome sections.

All the above Boilers (except Invincible Washday) have butterfly type damper and ashpit door for automatic regulation.

When Hot Water Supply Boilers are subjected to some unusual pressure, as is the case when tanks are connected direct to city pumping station, and the pressure is increased during times of conflagration or the like, it is recommended that the system be equipped with a Water-Pressure Reducing Valve and Relief Valve.

No fire tools are supplied with above Boilers.

In cases of unusually high city water pressure or where the demand for hot water supply is very large, we recommend the use of Ideal Steam Boilers in connection with storage tank.

THE STEWART COPPER COIL HOUSE HEATER

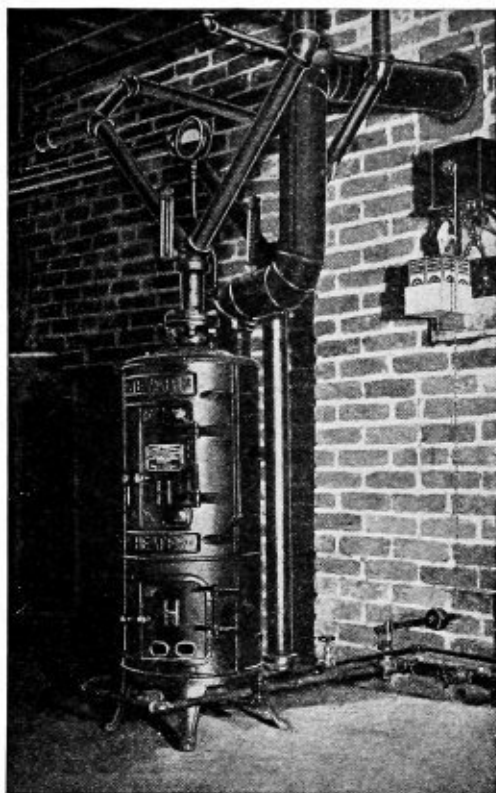


FIG. 660

In use on a hot water heating system. Automatically controlled by
The Marvel Temperature Regulator

The Stewart Heater is sold with the understanding that if for any reason it is unsatisfactory it may be returned at full selling price any time within one year of date of shipment; also, that any defective parts will be replaced without cost any time within one year. In case that a heater which is returned under the terms of the guarantee has been damaged, the cost of replacing the damaged parts will be deducted from the selling price.

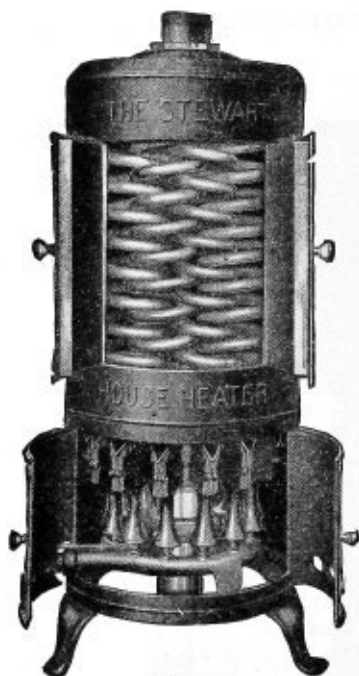


FIG. 661

THE STEWART COPPER COIL HOUSE HEATER

This heater consists essentially of a number of coils of heavy seamless drawn copper tubes in continuous lengths from inlet to outlet, connected to a central By-Pass.

The Stewart Heater is conservatively rated, allowing for deterioration in time as well as unusual conditions that arise, such as low gas pressure, extremely cold or windy weather, etc. In arriving at the proper size of heater to be used for a given amount of direct hot water radiation, 50 per cent must be added to provide for losses through pipe, fittings, and other parts.

The Stewart Heater is made in different sizes, and conservatively rated as follows. The capacity obtainable, however, is not limited to that of the largest size heater, as any number of heaters of any size may be used in combination with perfectly satisfactory results. Sizes up to and including the 18W are single units, the 2-12 and up are a number of units; the first number represents the number of heaters, the last number the size.

No.	Rating (see note)	Shipping Weight	Price
4-W	450	100 lbs.	\$ 100.00
8-W	800	300 lbs.	136.00
12-W	1,200	400 lbs.	204.00
18-W	1,800	600 lbs.	306.00
2-12-W	2,400	800 lbs.	408.00
2-18-W	3,600	1,200 lbs.	612.00
4-12-W	4,800	1,600 lbs.	816.00
3-18-W	5,400	1,800 lbs.	918.00
5-12-W	6,000	2,000 lbs.	1,020.00
4-18-W	7,200	2,400 lbs.	1,224.00
7-12-W	8,400	2,800 lbs.	1,428.00
5-18-W	9,000	3,000 lbs.	1,530.00

NOTE: Rating is for heater capacity. In arriving at the proper size of heater to be used in a given system increase the actual amount of radiation installed 50 per cent to allow for mains, branches, etc. Prices are for the heater only, and do not include fittings nor trimmings. Prices upon request for fitting up heaters with Y Branches or Headers.

THE STEWART STORAGE HEATER

Capacity, 300 Gallons Per Hour.

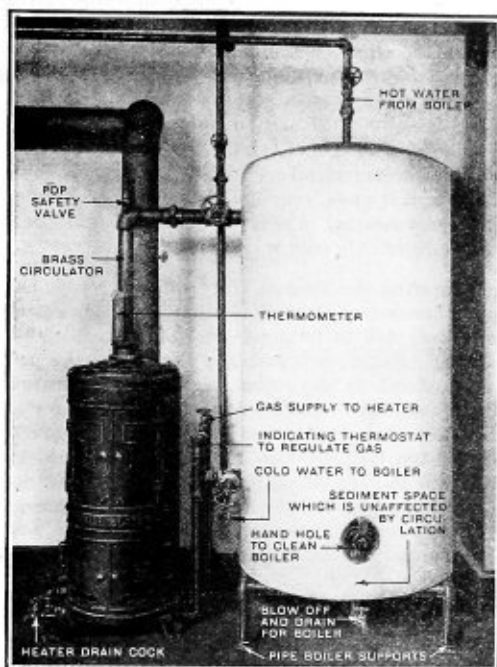


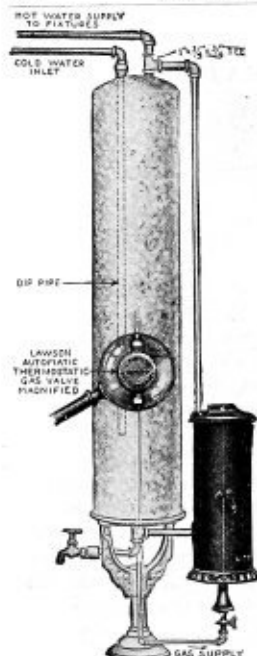
FIG. 662

The illustration here shows the Stewart Heater connected to a storage tank, for which use it is so constructed that it is instantaneous with the many advantages of a storage heater. The circulation is regulated so that the water is raised to the desired temperature by passing through the heater once.

The tank is set upright on an adjustable stand and takes a minimum amount of space. It is not fastened to the wall, and is easily and quickly installed. The stand is made of wrought iron pipe, three-way ells, flanges, etc., in sizes to suit the various sizes of storage tanks. It is not furnished with tanks, however, unless expressly ordered.

No.	Capacity, Gal. per hr.	Shipping Weight Lbs.	Circulator Feed Ins.	Connections, Return Ins.	Price
1—D	100	100	1-1½	1-1½	\$100.00
2—D	100	300	1-1½	1-1½	150.00
3—D	300	400	1-2	1-2	225.00
4—D	400	600	2-1½	2-1½	300.00
5—D	500	700	1-2½	1-2½	375.00
6—D	600	800	2-2	2-2	450.00
7—D	700	1,000	{ 1-1½ 1-2½ }	{ 1-1½ 1-2½ }	525.00
8—D	800	1,100	{ 1-2 1-2½ }	{ 1-2 1-2½ }	600.00

Main gas connection, 1 inch; pilot burner connection, ½ inch.



Showing the Proper Method of Connecting Lawson-Heater and Thermostatic Valve to Boiler.

FIG. 663

THE LAWSON THERMOSTATIC VALVE

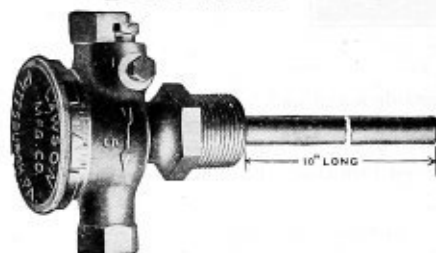


FIG. 664

No.	Length of Stem	Size of Connections	List Price
5	10 inches	$\frac{3}{8}$	\$12.00
8	10 inches	$\frac{1}{2}$	27.00

manufactured gas per hour.

The No. 8 is a large capacity valve being especially adapted for large heaters and boilers, gas fired steam and hot water boilers, and special appliances of various kinds using gas for fuel.

This valve is recommended for one or more burners with total capacity up to 500 cubic feet of natural gas or 350 cubic feet of manufactured gas per hour.

LAWSON WATER HEATERS

Lawson Water Heaters and Thermostatic Valves will keep your house abundantly supplied with hot water all the time, at minimum consumption of gas.

From washday morning until the proverbial Saturday's tub night there's nothing that adds so much to your home comfort as plenty of hot water and—just when you need it. At all hours of the day and night the various members of the family are liable to make a call upon your hot water supply and it's mighty exasperating when you find that the "hot" faucet delivers only cold water.

Connecting the Heater—Very often a heater has been condemned or classed as "slow" when the fault was entirely due to improper installation. See that the boiler is equipped with the "dip" pipe on the inside as shown by the dotted line on the illustration opposite and that the cold water supply is connected to it. Reversed connections will destroy the efficiency of the heater. Run the hot water from the heater into the top of boiler as illustrated and not into the side of the boiler. Proper installation means full efficiency and satisfied customers. For the best results use the method of installation shown in large illustration.

Also furnished with shorter stems at same price. Prices for stems over ten inches on application.

This valve maintains a constant uniform supply of hot water by increasing or diminishing the flow of gas to the burners. When the temperature of the water inside the boiler falls, the Lawson Thermostatic Valve sends more gas to the burners. When the temperature reaches a certain given point the gas flow is automatically checked.

The No. 5 Valve is recommended for single burners with capacities up to 100 cubic feet of natural gas and 60 cubic feet of

Nos. 1
and 2

LAWSON WATER HEATERS

Nos. 5 and 7

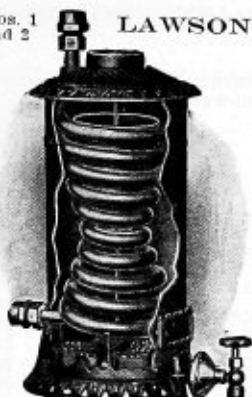


FIG. 665

Nos. 1 and 2, Single Copper Coil, Steel Jacket Heaters



FIG. 666

Nos. 5 and 7, Single Copper Coil, Cast Jacket Heaters

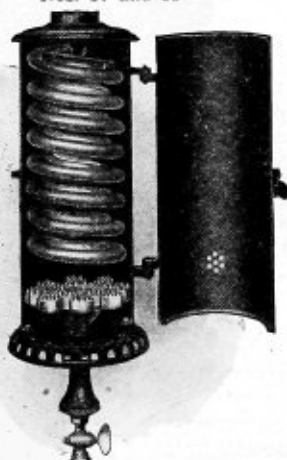


FIG. 667

Nos. 20 and 22, Double Copper Coil, Cast Jacket Heater

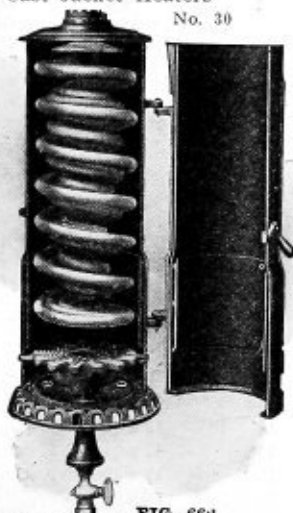


FIG. 668

No. 30, Triple Copper Coil Cast Jacket

No.	Diameter Inches	Height Inches	Size of Tube		Crated Weight	List Prices
			Dia.	Length		
1	7½	14	¾ in.	9 ft.	23 lbs.	\$12.00
2	7½	18	¾ in.	14 ft.	27 lbs.	18.00
Gasoline	7½	18	¾ in.	14 ft.	70 lbs.	45.00
5	7	15	¾ in.	9 ft.	30 lbs.	15.00
7	7	19	¾ in.	14 ft.	34 lbs.	21.00
20	7	20½	¾ in.	16½ ft.	40 lbs.	27.00
22	7	22½	¾ in.	20 ft.	42 lbs.	28.00
30	8½	28	¾ in.	32 ft.	80 lbs.	50.00

When ordering please state whether for natural or manufactured gas.

GALVANIZED, FULL CAPACITY, RANGE BOILERS



FIG. 669

Made in two grades:

Standard, under 85 lbs. maximum working pressure.

X Heavy, under 150 lbs. maximum working pressure.

Capacity Gallons	Size Inside	Price
18	36 x 12	\$14.50
21	42 x 12	15.50
24	48 x 12	15.75
24	36 x 14	19.00
27	54 x 12	18.50
28	42 x 14	20.25
30	60 x 12	19.00
32	48 x 14	21.00
36	54 x 14	21.50
40	60 x 14	24.00
42	48 x 16	26.00
47	54 x 16	30.00
52	60 x 16	31.00
53	48 x 18	31.50
66	60 x 18	38.00
82	60 x 20	45.50
100	60 x 22	63.50
120	60 x 24	72.50
144	72 x 24	103.00
168	84 x 24	120.00
192	96 x 24	132.00

Extra charge for all tapping in excess of four.

SPECIAL TAPPINGS

Extra Each Net.

1 1/4 - 1 1/2 in.
\$0.252 in.
.502 1/2 in.
1.003 in.
1.504 in.
2.00GALVANIZED EXPANSION TANKS
FOR HOT WATER HEATING IN DWELLINGS, ETC.

Tapped for 1/2 in. Gage.

Nominal Capacity Gallons	Size Inches	Price
5 1/2	9 x 20	\$ 6.00
8	10 x 20	7.50
10	12 x 20	8.00
12	12 x 24	8.50
15	12 x 30	9.00
18	12 x 36	9.50
20	14 x 30	12.50
24	14 x 36	13.00
26	16 x 30	14.00
32	16 x 36	15.00
42	16 x 48	16.50
66	18 x 60	31.00
82	20 x 60	37.00
100	22 x 60	51.00
120	24 x 60	58.00

If desired for pressure, special prices on application.

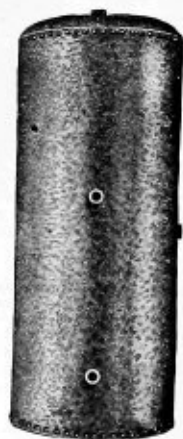


FIG. 670

BOILER STANDS

Ring	inches	11 $\frac{1}{2}$	12	13	14	15	16
Plain	each	\$1.25	1.25	1.30	1.40	1.50	1.75
Galvanized	each	2.50	2.50	2.60	2.70	3.00	3.25

Ring	inches	17	18	20	22	24
Plain	each	\$2.00	2.50	3.00	3.50	4.00
Galvanized	each	4.00	4.75	5.50	6.50	7.50

Any of the above, 30 inches high, add 40 cents each to list plain and 80 cents galvanized.



FIG. 671

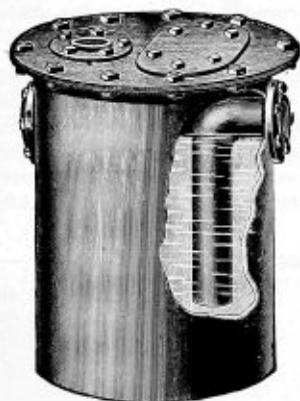


FIG. 672

CAST-IRON BLOW-OFF TANKS

Our blow-off tanks are fitted with combination screw and lead joint outlet so that you can use wrought or soil pipe without changing. One side inlet or two top inlets, or vents 3 $\frac{1}{2}$ inches or less.

Inside Diam., Inches	Depth, Inches	Each	Inside Diam., Inches	Depth, Inches	Each	Inside Diam., Inches	Depth, Inches	Each
24	30	\$40.00	30	30	\$ 60.00	42	42	\$110.00
24	36	50.00	30	36	65.00	42	48	120.00
24	42	55.00	30	42	70.00	42	54	130.00
24	48	60.00	30	48	75.00	42	60	140.00
24	54	65.00	30	54	80.00	48	48	150.00
24	60	70.00	30	60	85.00	48	54	160.00
26	30	50.00	36	36	85.00	48	60	170.00
26	36	55.00	36	42	95.00	48	66	180.00
26	42	60.00	36	48	105.00	48	72	190.00
26	48	65.00	36	54	115.00	60	60	320.00
26	54	70.00	36	60	125.00	60	72	360.00

SCIENTIFIC SAFETY GARAGE HEATER AND THERMO-VALVE

Heater



FIG. 673

SCIENTIFIC HEATER

Is built especially for warming the garage. It is, in fact, a complete heating plant giving a rapid circulation of warm dry air to all parts of the garage.

The sides do not radiate heat, so that it can be placed in any corner or right next to the auto without the slightest danger of scorching.

The heater is made of acid resisting metal and burns natural or artificial gas.

Approved by board of fire underwriters.

Protects motor cars and trucks against freeze-ups and damage from cold, makes motors start easy and run without sputtering. Keeps the oil flowing and saves bearings. Makes a wash-up possible regardless of weather. 6,000 in use.

MADE IN THREE SIZES

For garages 14x24, 16x20 or 18x20—No. 750.....	\$75.00
For garages 18x30, 20x28, 22x26 or 24x24—No. 751.....	90.00
For garages 24x38, 26x36, 28x34 or 30x22—No. 752.....	140.00

Thermo-Valve



FIG. 674

SCIENTIFIC THERMO-VALVE

Saves gas by keeping temperature constant. Prevents over-heating and does not allow any gas to pass except that necessary to maintain the desired temperature. Used on above heater, gas radiators, gas stoves, etc.

Size ½-inch, Black Finish.....	\$10.00
Brushed Brass Finish.....	12.00

LAWSON ODORLESS GAS ROOM HEATERS FOR MANUFACTURED OR NATURAL GAS

Nos. 0-1

Nos. 10, 20, 30
With Flat Top for Heating Liquids

FIG. 675



FIG. 676

Gas cock (as shown) for natural gas, or "Safety First" hose connection (as shown on the No. 210 series) for manufactured gas.

No.	Height, in.	Length, in.	Spread of Feet, in.	Shpg. wt. lbs.	For Rooms, ft.	Price Black	Price Nickel
0	12	6	5	8	6x8	\$5.00	\$5.75
1	12	10	5	10½	10x12	6.00	6.75
10	13	10	5	12	10x12	6.75	8.00
20	15	15	6	25	14x16	10.75	13.50
30	17	20	7	34	18x20	16.25	20.25

In ordering, state whether for natural or manufactured gas.
Nos. 210, 220, 230



FIG. 677

NOS. 210-220-230

Lawson Odorless Models Nos. 210, 220 and 230 are in the latest and most improved design of this marvelous room heater. In addition to the top this model has an ornamental base, making it especially attractive in appearance. For manufactured gas "safety first" hose connection as shown. For natural gas, gas cocks as shown on above heaters.

No.	Height, in.	Length, in.	Spread of Feet, in.	Shipping Wt., lbs.	For Rooms, ft.	Price Black	Price Nickel
210	15½	10	7½	16	10x12	\$8.00	\$9.50
220	17½	15	8¼	26½	14x16	13.50	16.25
230	19½	20	9	39½	18x20	19.00	24.00

In ordering, state whether for natural or manufactured gas.

LAWSON COPPER BACK REFLECTORS



FIG. 678

Burner is fitted with genuine lava tips. Nickel-plated gas-cock for natural gas; "safety first" hose connection for manufactured gas.

Knobs, corner ornaments, and name plate are stamped out of solid sheet aluminum which will not rust or discolor.

Fancy picket guard is finished in copper to match reflector.

No.	Width at Floor, in.	Depth at Floor, in.	Height, in.	Number of Tips	Shpg. Wt., lbs.	For Rooms, ft.	Price
3	12½	9	20	14	10½	8x10	\$ 8.00
7	17½	10½	22	21	14	10x12	12.00
11	22½	10½	24	28	18½	14x16	16.25
13	27½	10½	25	35	23	16x18	20.25

In ordering, state whether for natural or manufactured gas.

LAWSON OPEN FRONT HEATERS

No. 104

This heater operates on the radiant heat principle. Its "heart," behind the open grate, produces a ruddy glow, of pleasing effect and radiant, cheerful warmth.

The dome swings around, giving access to the removable lid in the flat top. Gas-cock connection for use with natural gas; "safety first" hose connection for manufactured gas.

Finish—Dome, top and legs nickel-plated; body polished black.

Extreme height	25½ inches
Height to main top	20 inches
Width at floor	15½ inches
Depth at floor	8½ inches
Shipping weight	30 pounds
For rooms	12x14 feet
Price	\$12.00

"Safety first" hose connection as shown, for manufactured gas. Gas cock for natural gas.

In ordering, state whether for natural or manufactured gas.



FIG. 679

PERFECTION SMOKELESS OIL HEATERS



FIG. 680

When it comes to supplying warmth for cold corners, a Perfection Smokeless Oil Heater provides the most inexpensive heat you can use. It is portable—take it wherever you need the heat.

They burn kerosene oil, the low-priced ideal fuel.

These little heaters measure about twenty-five inches in height and twelve inches in diameter. They are light in weight and easy to carry from room to room.

No. Heater	660	630	530	525
Trimming	Nickel	Nickel	Nickel	Japanned
Drums	Blue Vitreous Enamel	Blue Vitreous Enamel	Polished Steel	Polished Steel
Reservoir	Brass	Steel	Steel	Steel
Height	24 1/4	24 1/4	24 1/4	24 1/4
Weight	12 3/4	11 3/4	9 3/4	9 3/4
Price	\$8.50	6.50	5.00	4.50

No. 560, same as No. 530, except Brass Reservoir.....\$7.00

No. 550, same as No. 525, except Brass Reservoir..... 6.50

No. 500, Perfection Heater Wicks. They come to you in a carton with the top edge of the wick burned off and trimmed ready for lighting. All that you have to do is to slip out the old wick with carrier, throw both away, and slip in a new wick already attached to a new carrier. Anyone can now rewick a Perfection Oil Heater. Priceeach \$0.25

NO. 33 NEW PERFECTION OIL COOK STOVES

With Cabinet



FIG. 681

Without Cabinet

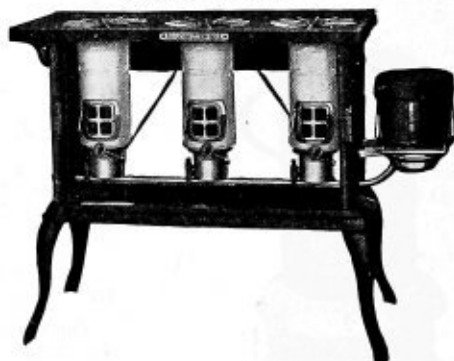


FIG. 682

The long glass lamp chimney gave the world clean, steady light. The Long Blue New Perfection Chimney gave the world clean, intense heat. It's the Long Blue Chimney that makes the New Perfection Oil Cook Stove the permanently satisfactory kerosene burning stove.

Kerosene is inexpensive, everywhere available, easy to handle and saves the labor of coal, ashes and kindling.

To light the New Perfection burner you simply open the small door in the blue chimney, turn up the wick, apply lighted match, close door and in less than a minute you have the full heat of the burner applied to the vessels you want heated.

New Perfection Cook Stoves are furnished with wicks, affixed to metal carriers, which, with care, will last a season. The genuine New Perfection Wicks (burned off ready for use) can be procured from any dealer, and are easily and quickly inserted.

With Cabinet—The dimensions and weights are as follows:

Height	55 in.
Dimensions of top of Cabinet.....	11¼x35¼ in.
Weight	83½ lbs.
Price	each, \$24.25

Without Cabinet—The dimensions and weights are as follows:

Height	50½ in.
Top	17x35 in.
Length over all	43½ in.
Net weight	42 lbs.
Price	each, \$18.00

SLOP SINKS WITH OR WITHOUT BELL TRAPS



FIG. 683

Fitted regularly for lead pipe. Will be fitted with 2-inch or 4-inch outlet, if desired, at same price.

Size	Depth	Painted	White Enameled
16x16-inch	10-inch	\$2.70	\$4.50
14x20-inch	12-inch	3.50	5.10
20x24-inch	12-inch	5.00	7.25

HEAVY CESS POOL WITH BELL TRAP



FIG. 684

Size	Depth	Outlet	Painted
16x16-inch	10-inch	4-inch	\$4.50

STABLE CESS POOLS WITH BELL TRAPS



FIG. 685

Size	Outlet	Price
6x 6-inch	1½-inch	\$0.75
9x 9-inch	3 inch	1.00
13x13-inch	4 inch	2.00

CAST IRON KITCHEN SINKS PAINTED OR PORCELAIN ENAMELED

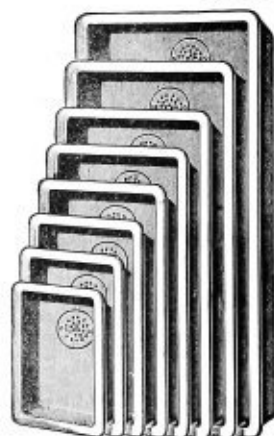


FIG. 686

Size, Inches	Depth, Inches	Price, Painted	Price, Enameled
12x18	6	\$1.25	\$2.95
12x20	6	1.40	3.15
14x20	6	1.50	3.45
14x22	6	1.60	3.65
14x24	6	1.70	3.75
15x27	6	2.00	4.25
16x24	6	1.90	4.10
16x28	6	2.10	4.60
16x30	6	2.25	4.90
18x24	6	2.10	4.40
18x30	6	2.50	4.25
18x32	6	2.75	4.65
18x36	6	3.25	4.75
20x24	6	2.40	3.75
20x30	6	3.00	4.50
20x36	6	3.70	5.25
20x40	6	4.00	5.75
20x42	6	4.25	6.00
22x42	6	4.75	6.25
24x48	6	6.00	7.75
24x50	6	7.50	9.00

Sinks are always fitted with Lead Pipe Connections unless otherwise specified, but can be fitted with Iron Pipe Connections at an additional charge.



FIG. 687

ADJUSTABLE SINK BRACKETS

Size 16x18	Price per pair
Painted	\$0.80
Galvanized	1.50
White Enameled	1.60
Nickel Plated	1.60

Prices on Sink Brackets do not include bolts.

SINK COUPLINGS FOR LEAD PIPES

Price per dozen.....\$1.50

SINK COUPLINGS FOR IRON PIPES

Price each\$0.30



FIG. 688



FIG. 689

NATIONAL KITCHEN SINKS

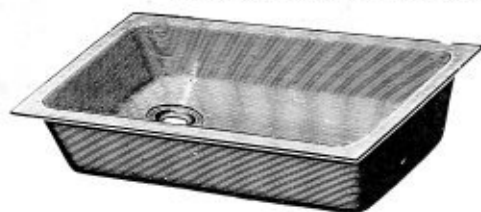
SEAMLESS WROUGHT STEEL. WITH FLAT EDGES
WITH EITHER FLAT OR PLUG STRAINERS

FIG. 690

Style A. Sinks are furnished without holes punched at Waste Outlet, and No. 310 Brass Couplings are used which require two $\frac{3}{8} \times \frac{3}{8}$ inch brass screws for making connection with sink. Opening of Waste Outlet $1\frac{1}{8}$ inches.

Style B. Sinks are furnished with two holes punched at Waste Outlet and the No. 10B or No. 110B Cast Iron Couplings are used in making connection with

sink. Opening of Waste Outlet $1\frac{1}{8}$ inches.

Style C. Sinks are furnished with four holes punched at Waste Outlet and the No. 10C or 110C Cast Iron Couplings are used in connection with this style. Two of the holes are used in screwing on the Cast Iron Clamping Collar and the other two in screwing on the Strainer. This permits of the Strainer being removed independently and does not necessitate the loosening of the pipe in removing same. Opening of Waste Outlet $1\frac{1}{8}$ inches.

Always Order Sinks by Numbers and State Style Wanted

NATIONAL KITCHEN SINKS. WITH FLAT EDGES.

IN EITHER STYLES, A, B OR C

Inches	14x20x6	16x24x6	18x30x6	18x36x6	20x30x6	20x36x6	20x40x6
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PLAIN

Nos.	1	3	4	5	6	7	8
Each	\$1.60	1.75	2.25	2.75	2.50	3.25	4.00

PAINTED

Nos.	11	13	14	15	16	17	18
Each	1.85	2.00	2.50	3.25	3.00	3.75	4.50

GALVANIZED

Nos.	21	23	24	25	26	27	28
Each	2.25	2.50	3.25	4.00	3.75	4.50	5.25

BLUE AND BLUE ENAMELED

Nos.	31	33	34	35	36	37	38
Each	3.25	3.50	4.50	5.50	5.25	6.25	7.25

BLUE AND WHITE ENAMELED

Nos.	41	43	44	45	46	47	48
Each	5.00	5.25	6.50	7.50	7.25	8.25	9.25

ROYAL GRANITE ENAMELED

Nos.	51	53	54	55	56	57	58
Each	3.75	4.00	5.00	6.00	5.75	6.75	7.75

WHITE AND WHITE ENAMELED

Nos.	61	63	64	65	66	67	68
Each	5.00	5.25	6.50	7.50	7.25	8.25	9.25

LEAD TRAPS

Full "S" Three-quarter "S"

Half "S"

Running

Running "Y"

Bag



FIG. 692

FIG. 693

FIG. 694

FIG. 695

FIG. 696

FIG. 697

PLAIN

Weigh.....	Standard					Extra Heavy				
	1 1/4	1 1/2	2	3	4	1 1/4	1 1/2	2	3	4
Size.....inches										
Price, full "S" ...each	\$0.58	\$0.90	\$1.38	\$2.60	\$3.25	\$0.87	\$1.25	\$1.85	\$3.09	\$4.30
Price, 3/4 "S" ...each	.55	.81	1.30	2.62	3.07	.81	1.15	1.73	2.97	3.95
Price, 1/2 "S" ...each	.51	.75	1.20	2.24	2.49	.77	1.09	1.57	2.58	3.25
Price, running ...each	.48	.72	1.13	2.09	2.53	.70	1.03	1.46	2.35	3.28
Price, running "Y" each	.52	.76	1.34	2.46	3.15	.74	1.09	1.61	2.88	4.05
Price, bag .....each	.68	1.08	1.73	3.35	4.77	1.06	1.54	2.33	3.96	6.30

Full "S" Three-quarter "S" Half "S"

Running

Running "Y"

Bag



FIG. 698

FIG. 699

FIG. 700

FIG. 701

FIG. 702

FIG. 703

VENTED

Weight.....	Standard					Extra Heavy				
	1 1/4	1 1/2	2	3	4	1 1/4	1 1/2	2	3	4
Size.....inches										
Price, full "S" ...each	\$1.38	\$1.85	\$2.33	\$3.94	\$4.50	\$1.67	\$2.20	\$2.80	\$4.34	\$5.55
Price, 3/4 "S" ...each	1.35	1.76	2.25	3.87	4.32	1.61	2.10	2.68	4.22	5.20
Price, 1/2 "S" ...each	1.31	1.70	2.15	3.49	3.74	1.57	2.04	2.52	3.83	4.50
Price, running ...each	1.28	1.67	2.08	3.34	3.78	1.50	1.98	2.41	3.60	4.53
Price, running "Y" each	1.32	1.71	2.29	3.71	4.40	1.54	2.04	2.56	4.13	5.30
Price, bag .....each	1.48	2.03	2.68	4.60	6.02	1.86	2.49	3.28	5.21	7.55

Prices include brass drain screws on all sizes except 4-inch.

Eighth bend vent connections will be furnished, if not otherwise specified; 2-inch vented traps are furnished with 1 1/2-inch vent; if 2-inch vent is desired, add 30 cents to list.

3 and 4-inch vented traps have 2-inch vent.

DIAMOND CAST IRON TRAPS

No. 4000

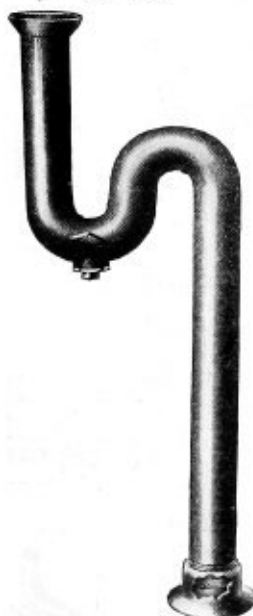


FIG. 704

NO. 4000 TRAP

WITH CAST FLOOR FLANGE

Length over all about two feet, floor flange giving an adjustment of about one inch. Fitted with brass cleanout screw, and threaded for iron pipe.

No. 4000. Regular iron sink collar for lead pipe slips over this trap, engaging the bell end at top to fasten trap to sink.

Size	inches	1 1/4	1 1/2
Price, Painted	each	\$1.50	\$2.00
Price, Galvanized	each	2.25	2.90
Price, Painted White Enamel.....	each	2.25	2.90

No. 4104



Fig. 705

NO. 4104 HALF "S" TRAP
WITH DOUBLE CLEAN
OUT SCREWS

They have brass clean-out screw at bottom of trap, and on top near waste end. They are threaded for iron pipe.

No. 4104. Regular iron sink collar slips over this trap, engaging bell at top to fasten trap to sink.

Size, Iron Pipe	inches	1 1/4	1 1/2
Price, Painted	each	\$1.10	\$1.35
Price, Galvanized	each	1.50	1.85

No. 4056



Fig. 706

NO. 4056 UNIVERSAL TRAPS

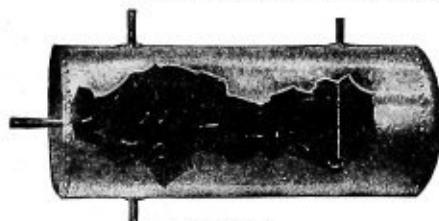
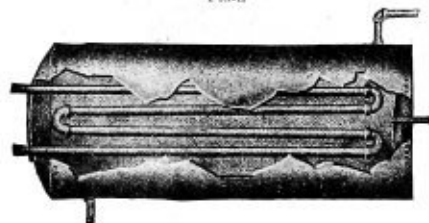
These traps have brass clean-out screw, and are threaded for iron pipe.

Use of a tee on outlet end provides vent, when desired.

No. 4056. Regular iron sink collar slips over this trap, engaging the bell end at top to fasten trap to sink.

Size, Iron Pipe	inches	1 1/4	1 1/2
Price, Painted	each	\$0.75	\$1.00
Price, Galvanized	each	1.15	1.50

STANDARD BLACK STORAGE TANKS

FIG. 707
PlainFIG. 708
With Coil

For ordinary water storage purposes not to exceed 65 pounds working pressure. All tanks tested to 100 pounds hydrostatic pressure. Tapped as shown so that they may be used horizontal or vertical. Made with coils, manholes, etc., if specially ordered. If special tapings are desired, give sketch showing size and location of openings. Brass and copper coils quoted on application.

LIST PRICE OF STANDARD BLACK STORAGE TANKS AND COILS

MANUFACTURER'S STANDARD LIST, REVISED JULY 1, 1917

Capacity Gallons	SIZE		Approx. Shipping Weight Pounds	Regular Openings Inches	List Price Black	LIST PRICE COILS BUILT IN TANKS		
	Diam. Inches	Length Feet				Size Coil	Plain Coil	Galv. Coil
66	20	4	225	1 1/2	\$ 87.00	4 pipes, 1 inch	\$29.00	\$35.00
85	20	5	260	1 1/2	94.00	4 " 1 " "	30.50	38.50
101	24	4	280	1 1/2	102.00	4 " 1 1/4 " "	35.50	42.00
120	24	5	325	1 1/2	112.00	4 " 1 1/4 " "	37.00	45.00
140	24	6	360	1 1/2	122.00	4 " 1 1/4 " "	38.50	48.00
150	30	4	425	2	134.00	4 " 1 1/4 " "	35.50	42.00
180	30	5	490	2	147.00	4 " 1 1/4 " "	37.00	45.00
220	30	6	555	2	157.00	4 " 1 1/4 " "	38.50	48.00
250	30	7	620	2	176.00	4 " 1 1/4 " "	40.00	51.00
295	30	8	685	2	197.00	4 " 1 1/4 " "	41.50	54.00
315	36	6	740	2	203.00	4 " 1 1/2 " "	51.00	62.00
365	36	7	825	2	228.00	4 " 1 1/2 " "	54.00	66.00
420	36	8	910	2	248.00	4 " 1 1/2 " "	57.50	70.00
525	36	10	1080	2	288.00	4 " 1 1/2 " "	64.00	78.00
430	42	6	890	2	265.00	4 " 1 1/2 " "	51.00	62.00
500	42	7	985	2	290.00	4 " 1 1/2 " "	54.50	66.00
575	42	8	1080	2	315.00	4 " 1 1/2 " "	57.50	70.00
720	42	10	1270	2	363.00	4 " 1 1/2 " "	64.00	78.00
865	42	12	1460	2	408.00	4 " 1 1/2 " "	70.50	85.00
1000	42	14	1650	2	456.00	4 " 1 1/2 " "	77.00	93.00

Manhole in head.....	List \$30.00
" " shell.....	45.00
Handhole in head.....	8.00
" " shell.....	8.00

FLANGED OPENINGS
EXTRA

Size 2 inches.....	\$ 8.00
" 2 1/2 ".....	8.00
" 3 ".....	9.00
" 3 1/2 ".....	9.00
" 4 ".....	10.00

PNEUMATIC PRESSURE TANKS



FIG. 709

STANDARD PNEUMATIC PRESSURE TANK LIST, REVISED
JULY 1, 1917

Capacity, Gallons	Diameter, Inches	Length, Feet	Weight, Pounds	List Price
120	24	5	350	\$ 105.00
145	24	6	400	115.00
245	24	10	600	165.00
220	30	6	500	154.00
295	30	8	600	189.00
365	30	10	750	224.00
315	36	6	700	206.00
420	36	8	850	251.00
525	36	10	1,000	291.00
630	36	12	1,150	331.00
735	36	14	1,350	376.00
575	42	8	1,400	367.00
720	42	10	1,600	429.00
865	42	12	1,850	491.00
1,000	42	14	2,100	553.00
940	48	10	2,000	504.00
1,300	48	14	2,500	648.00
1,500	48	16	2,800	722.00
1,880	48	20	3,400	873.00
2,260	48	24	3,900	1,017.00

The above are regular tanks and the prices do not include water gauges and other fittings.

Galvanized tanks, special tanks, and other sizes, and tanks, with manholes and handholes, quoted on application.

PENBERTHY CELLAR DRAINERS



FIG. 710



FIG. 711



This is a water pressure ejector of high capacity, made of best bronze metal, automatically operated by a copper float controlled, quick opening and closing valve. It cannot leak, and allows the ejector to give its greatest efficiency by working to full capacity. The float arms are slotted where they connect to the valve lever. This prevents the ejector from operating until the water has raised the float to the highest point; and, as the water is ejected, the arms travel down the length of these slots before the weight of the float affects the valve. This allows the machine to work for longer periods, and not so often, thus preventing considerable wear and the leakage and dribbling of water, common in the majority of drainers. Has no leather washers to dry up and leak.

To make possible the installation of this drainer in small holes or sumps, it has been made as compact as possible. The float, instead of being round, is flat on the top, thus occupying less space than a round float. The float is built around the suction pipe. This patented feature has the added advantage of being rigid and overcomes all the trouble of the common loose float. The balance of the drainer is built directly above the float. This not only keeps the whole machine in as small a space as possible, but also keeps all working parts, with the exception of strainer, suction pipe and float, above the water. Because of this there is no chance of corrosion or of the exterior parts becoming clogged up by deposits of slime, dirt or sediment. A special strainer prevents any foreign particles from coming in contact with the interior parts. A foot valve is also provided inside the strainer, which closes the instant the drainer ceases operation, holding all the water in the pipes all primed for starting instantly at the next filling of the sump, and also preventing flooding of the cellar if for any reason the water pressure is insufficient to operate the ejector.

Number	Price, Each		Supply Pipes Inches	Discharge Pipe Inches	Extreme Width Inches	Capacity Gallons per Hour
	Automatic	Non-Automatic				
1	\$25.00	\$15.00	$\frac{1}{2}$	1	9	115 to 650
2	40.00	25.00	$\frac{3}{4}$	$1\frac{1}{4}$	$10\frac{1}{2}$	180 to 1050
3	55.00	35.00	1	$1\frac{1}{2}$	$13\frac{1}{2}$	310 to 1650
4	80.00	50.00	$1\frac{1}{4}$	2	$17\frac{1}{2}$	450 to 2400
5	110.00	70.00	$1\frac{1}{2}$	$2\frac{1}{2}$	20	600 to 3200
6	160.00	100.00	2	3	24	780 to 4200
7	225.00	135.00	$2\frac{1}{2}$	$3\frac{1}{2}$	28	1000 to 5300
8	300.00	175.00	3	4	32	1250 to 6500

Capacities given above represent actual water removed from the pit.
 Sizes 7 and 8 made to order only.

CAST-IRON EXTENSION SERVICE BOXES

FOR WATER OR GAS

 $2\frac{1}{2}$ inch Diameter of Shaft

FIG. 712

Size	Price	Weight, lbs.	Extension
88	\$0.80	10	1 ft. stationary length
89-A	1.00	12	1 ft. to 1 ft. 8 in.
90-B	1.05	14	1 ft. 6 in. to 2 ft. 2 in.
91-C	1.20	17	1 ft. 9 in. to 2 ft. 9 in.
92-C	1.30	18	2 ft. to 3 ft. 2 in.
92-D	1.45	20	2 ft. to 3 ft. 6 in.
93-D	1.55	21	3 ft. to 4 ft.
93-E	1.65	23	3 ft. to 4 ft. 6 in.
94-D	1.70	24	3 ft. 6 in. to 4 ft. 9 in.
94-E	1.75	25	3 ft. 6 in. to 5 ft.
95-E	1.90	29	4 ft. to 5 ft. 6 in.
100-E	2.05	31	4 ft. 6 in. to 6 ft.
100-F	2.15	33	4 ft. 6 in. to 6 ft. 6 in.
95-G	2.30	42	4 ft. to 7 ft.
100-G	2.45	45	4 ft. 6 in. to 7 ft. 6 in.

Stop box keyseach, \$0.10

 $2\frac{1}{2}$ -inch coverseach, .20

Brass boltseach, .15

VALVE BOXES

It is unnecessary to have the valve box quite as long as the depth of the main pipe, as the base of the box does not extend below the flange joint of valve dome, which is from 3 to 6 inches above the pipe.

VALVE BOXES— $5\frac{1}{4}$ -INCH SHAFT

WITH NO. 6 BASE FOR 6-INCH AND 8-INCH VALVES



FIG. 713

Size	Price	Weight, Lbs.	Extension
AAA	\$4.60	68	Stationary length, 1 ft. 5 in.
AA	5.55	87	Extends 1 ft. 10 in. to 2 ft. 4 in.
A	5.80	93	Extends 2 ft. 4 in. to 3 ft. 4 in.
B	6.30	100	Extends 3 ft. to 4 ft.
C	6.55	106	Extends 3 ft. 6 in. to 4 ft. 6 in.
CC	6.90	112	Extends 4 ft. to 5 ft.
D	7.30	115	Extends 3 ft. 6 in. to 5 ft. 6 in.
E	7.90	120	Extends 4 ft. to 6 ft.
F	8.40	125	Extends 5 ft. to 7 ft.
No. 58	1.35	19	Extension for $5\frac{1}{4}$ -in. valve boxes, increasing length 14 in.

Equipped with No. 4 round base for 4-inch valves, reduced price\$0.25

Equipped with No. 8 round base for 10-inch valves, add to price..... 50

Equipped with No. 16 round base for 12 to 16-inch valves, add to price 3.50

TOTAL ECLIPSE HYDRANTS AND STREET WASHERS

No. 1 Hydrant



FIG. 714

Anti-Freezing
No. 7 Self-Closing Hydrant

FIG. 715

No. 36 Street Washer

Extra Heavy
Cast-Iron Box, Japaned

FIG. 716

Size, opening	inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$\frac{3}{4}$	1
Length	feet	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	2	2	2	3	3
Price No. 1 Hydrant.....	each	\$9.80	12.70	19.70	10.10	13.50	20.50	10.60	14.30
Price No. 7 Hydrant.....	each	\$10.80	13.70	.....	11.10	14.50	.....	11.60	15.30
Price No. 36 Street Washer....	each	\$6.60	9.50	18.00	6.85	10.25	18.75	7.35	11.10

Size, opening	inches	$1\frac{1}{4}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$\frac{3}{4}$
Length	feet	3	4	4	4	5	5	5	6
Price No. 1 Hydrant.....	each	\$21.80	11.00	14.75	22.25	11.50	15.30	22.80	12.10
Price No. 7 Hydrant.....	each	.....	12.00	15.75	.....	12.50	16.30	.....	13.10
Price No. 36 Street Washer....	each	\$20.10	7.75	11.70	20.70	8.25	12.00	21.00	8.85

Size, opening	inches	1	$1\frac{1}{4}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Length	feet	6	6	8	8	8	10	10	10
Price No. 1 Hydrant.....	each	\$16.00	23.75	13.50	18.50	27.00	16.00	21.00	30.00
Price No. 7 Hydrant.....	each	\$17.00	.....	14.50	19.50	.....	17.00	22.00	.....
Price No. 36 Street Washer....	each	\$12.75	21.75	10.25	15.25	25.25	12.75	17.75	28.75

$\frac{3}{4}$ -inch Hydrant or Street Washer has combination inlet for $\frac{3}{4}$ or $\frac{1}{2}$ -inch connection; 1-inch Hydrant or Street Washer has combination inlet for 1 or $\frac{3}{4}$ -inch connection; $1\frac{1}{4}$ -inch Hydrant or Street Washer has combination inlet for $1\frac{1}{4}$ or 1-inch connection.

TOTAL ECLIPSE HYDRANT AND STREET WASHER REPAIRS



FIG. 717

No. 115	Sand cups for $\frac{3}{4}$ -inch hydrant or street washers.....each,	\$0.20
No. 124	Caps for $\frac{3}{4}$ -inch compression hydrants.....each,	.15
No. 130	Cap, handle and screw for $\frac{3}{4}$ -inch compression hydrants....each,	.70
No. 134	Handles for $\frac{3}{4}$ -inch compression hydrants.....each,	.20
No. 137	Screws for $\frac{3}{4}$ -inch compression hydrants.....each,	.35
No. 141	Screws for $\frac{3}{4}$ -inch compression street washers.....each,	.35
No. 159	Keys for $\frac{3}{4}$ -inch street washers	.20
No. 164	Brass couplings for $\frac{3}{4}$ -inch hydrants and street washers....each,	.30
No. 182	Hydrant casing for $\frac{3}{4}$ -inch hydrant (half).....each,	.60
No. 300	Valve body for $\frac{3}{4}$ -inch comp. hydrant or street washer.....each,	1.25
No. 305	Valve plunger for $\frac{3}{4}$ -inch comp. hydrant or street washer.....each,	.50
No. 315	Nozzle section for $\frac{3}{4}$ -inch comp. or self-closing hydrant.....each,	.60
No. 318	Brass nozzle coupling for $\frac{3}{4}$ -inch compression hydrant.....each,	.45
No. 320	Nozzle and plate for $\frac{3}{4}$ -inch comp. or self-closing hydrant.....each,	.40
No. 325	Top valve plunger cup washer for $\frac{3}{4}$ -inch hydrant or street washer	.15
No. 327	Small valve plunger cup washer for $\frac{3}{4}$ -inch hydrant or street washer	.10
No. 328	Flat valve washer for $\frac{3}{4}$ -inch hydrant or street washers....each,	.06
No. 330	Street washer box, $\frac{3}{4}$ -inch.....each,	.50
No. 334	Street washer plate, nozzle and screw, $\frac{3}{4}$ -inch.....each,	1.50
No. 335	Street washer plate, $\frac{3}{4}$ -inch.....each,	.20
No. 338	Street washer cap, $\frac{3}{4}$ -inch	.10
No. 340	Street washer, brass nozzle section, $\frac{3}{4}$ -inch.....each,	.50
No. 342	Street washer neck, $\frac{3}{4}$ -inch	.30
No. 400	Hydrant cap and catch for $\frac{3}{4}$ -inch self-closing hydrant.....each,	.50
No. 404	Hydrant handle and screw for $\frac{3}{4}$ -inch S. C. hydrant.....each,	.50
No. 408	Hydrant stem for $\frac{3}{4}$ -inch S. C. hydrant.....each,	.50
No. 415	Steel spring for $\frac{3}{4}$ -inch S. C. hydrant	.20
No. 418	Rubber ball seat for $\frac{3}{4}$ -inch S. C. hydrant.....each,	.20
No. 430	Valve body for $\frac{3}{4}$ -inch S. C. hydrant.....each,	1.25
No. 434	Valve plunger for $\frac{3}{4}$ -inch S. C. hydrant.....each,	.75

ECLIPSE ANTI-FREEZING FIRE HYDRANTS

No. 2 For Private Corporations
1½-inch 2-inch

FIG. 718

No. 4 Double-Valve Hydrant
For Sprinkling Purposes

FIG. 720



FIG. 719

	No. 2			No. 2	No. 4		
To Set in Ground	1½ in. Inlet and Outlet	1½ in. Inlet and Outlet	2 in. Inlet and Outlet	2½ or 3 in. Inlet Add to List	2 in. Inlet and Outlet	2½ in. Inlet and Outlet	3 in. Inlet, 2 in. or 2½ in. Outlet
1½ feet	\$11.85	\$16.30	\$22.25	\$2.00	\$28.25	\$32.25	\$34.25
2 "	12.00	16.45	22.50	2½ in. Outlet Add to List	28.50	32.50	34.50
3 "	12.30	16.80	23.00	\$1.00	29.00	33.00	35.00
4 "	12.65	17.15	23.50		29.50	33.50	35.50
5 "	13.00	17.50	24.00		30.00	34.00	36.00
6 "	13.50	18.00	24.75	2 Outlets Add to List	30.75	34.75	36.75
8 "	15.00	19.50	27.00		33.00	37.00	39.00
10 "	17.00	22.00	30.00	\$2.00	36.00	40.00	42.00

1½-foot list applies on any shorter length.

The No. 2 Hydrant is designed for private purposes, such as for stock yards, factories, lumber yards, railroads, fertilizing purposes, etc. The No. 4 Hydrant is designed for sprinkling or other purposes, where hydrant is to be operated very often each day.

Unless otherwise ordered, inlet is made for wrought iron pipe.
See instructions, before ordering, on bottom following page.



FIG. 721

HYDRANT WRENCHES

Priceeach, \$0.50

ECLIPSE ANTI-FREEZING FIRE HYDRANTS

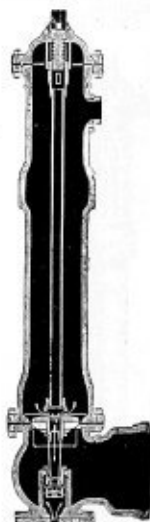
No. 3

Sectional

No. 6



FIG. 722



No. 3



FIG. 723

Diameter of Pipe Connection	Pavement to Center of Inlet,	One 2½-Inch Hose Nozzle	Two 2½-In. Hose Nozzles	Three 2½-In. Hose Nozzles	One Steamer Nozzle	One Steamer and One 2½-In. Nozzle	One Steamer and Two 2½-In. Nozzles	Frost Case for 5 Foot Hydrant	For Each Foot Plus or Minus	
									Stand Pipe	Frost Case
3 inches	5 feet	\$32.00	\$34.00	\$36.00	\$34.00	\$36.00	\$38.00	\$7.00	\$1.50	\$1.00
4 inches	5 feet	32.00	34.00	36.00	34.00	36.00	38.00	7.00	1.50	1.00
5 inches	5 feet	34.00	36.00	38.00	36.00	38.00	40.00	7.00	1.50	1.00
6 inches	5 feet	34.00	36.00	38.00	36.00	38.00	40.00	7.00	1.50	1.00

1½-foot list applies on any shorter length.

No. 6

4 inches	5 feet	\$47.00	\$49.00	\$51.00	\$49.00	\$51.00	\$53.00	\$10.00	\$2.25	\$2.00
6 inches	5 feet	47.00	49.00	51.00	49.00	51.00	53.00	10.00	2.25	2.00

No. 10

6 inches	5 feet	\$47.00	\$49.00	\$51.00	\$49.00	\$51.00	\$53.00	\$10.00	\$2.25	\$2.00
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Nos. 6 and 10 hydrants when set 7 feet in ground or deeper are furnished with wrought iron stand-pipe, in which event add \$3.00 per foot to above lists.

To avoid any mistakes please observe following instructions in ordering:

Length from pavement to center of inlet; size of inlet, and state whether for cast or wrought iron pipe connection. We are prepared to furnish inlets suitable for Mathieson or Converse lock joint pipe, also for flange connection and wood pipe, at no additional cost; for extra or loose (Companion) flange, an extra charge is made. Size and form of nut to open hydrant. This nut is usually made pentagon (five sides) unless otherwise ordered. Number and size of hose nozzles. Unless otherwise ordered all hydrants made to turn to the left when opening. Send coupling or nozzle cap for gauge of thread, of which we keep a record. The sample thread is returned with hydrants unless otherwise instructed.

Frost cases furnished if desired for which an extra charge is made.

LIST OF PARTS ECLIPSE FIRE HYDRANTS



FIG. 724

TOP SCREW

No. 500—To refit 1¼ or 1½-inch Fire Hydrant.....each,	\$1.50
No. 501—To refit 2-inch Fire Hydrant.....each,	2.00
No. 503—To refit No. 3 Fire Hydrant.....each,	3.00
No. 504—To refit Nos. 6 and 10 Fire Hydrant.....each,	3.00



FIG. 725

TOP CONNECTING NUT

No. 510—To refit 1¼ or 1½-inch Fire Hydrant.....each,	\$1.50
No. 511—To refit 2-inch Fire Hydrant.....each,	2.00
No. 513—To refit No. 3 Fire Hydrant.....each,	3.00
No. 514—To refit No. 6 Fire Hydrant.....each,	3.00
No. 515—To refit No. 10 Fire Hydrant.....each,	3.00



FIG. 726

SEAT RING

No. 520—To refit 1¼ or 1½-inch Fire Hydrant.....each,	\$1.50
No. 521—To refit 2-inch Fire Hydrant.....each,	2.00
No. 523—To refit No. 3 Fire Hydrant.....each,	2.50
No. 524—To refit No. 6 Fire Hydrant.....each,	3.50
No. 525—To refit No. 10 Fire Hydrant.....each,	4.50



FIG. 727

PLUNGER COMPLETE

No. 530—To refit 1¼ or 1½-inch Fire Hydrant.....each,	\$2.00
No. 531—To refit 2-inch Fire Hydrant.....each,	4.00
No. 533—To refit No. 3 Fire Hydrant.....each,	5.00
No. 534—To refit No. 6 Fire Hydrant.....each,	8.00
No. 535—To refit No. 10 Fire Hydrant.....each,	10.00



FIG. 728

SEAT WASHER (RUBBER) FOR PLUNGER

No. 540—To refit 1¼ or 1½-inch Fire Hydrant.....per dozen, net...	
No. 541—To refit 2-inch Fire Hydrant.....per dozen, net...	
No. 543—To refit No. 3 Fire Hydrant.....per dozen, net...	
No. 544—To refit No. 6 Fire Hydrant.....per dozen, net...	
No. 545—To refit No. 10 Fire Hydrant.....per dozen, net...	

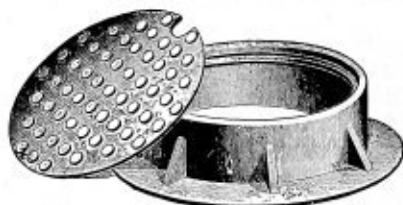


FIG. 729

CUP WASHER FOR PLUNGER

No. 560—To refit 1¼ or 1½-inch Fire Hydrant.....per dozen, net...	
No. 561—To refit 2-inch Fire Hydrant.....per dozen, net...	
No. 563—To refit No. 3 Fire Hydrant.....per dozen, net...	
No. 564—To refit No. 6 Fire Hydrant.....per dozen, net...	
No. 565—To refit No. 10 Fire Hydrant.....per dozen, net...	

MANHOLE CURB WITH SOLID COVER

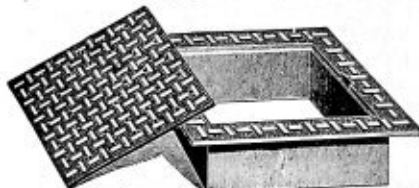


Diameter of opening, 22 inches.
Height above the flange, 8 inches.
475 lbs.

Prices on application.

FIG. 730

COALHOLE COVER AND FRAME

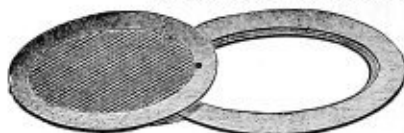


Cover, 24 x 24 inches outside.
Frame, 32 x 32 inches outside
425 lbs.

Prices on application

FIG. 731

CATCH BASIN RING AND COVER



Cover, 16 inches diameter.
Ring, 21 inches outside diameter.
45 lbs.

Cover, 18 inches diameter.
Ring, 24 inches outside diameter.
55 lbs.

Prices on application.

FIG. 732

SOOT DOORS AND FRAMES

THESE DOORS AND FRAMES ARE EXTRA HEAVY AND NICELY FITTED
Double Doors

Single Door

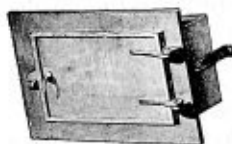


FIG. 733

8 x 10 inches	18 x 18 inches
12 x 12 "	20 x 24 "
12 x 14 "	24 x 24 "
14 x 16 "	24 x 30 "
14 x 18 "	30 x 24 "
16 x 20 "	

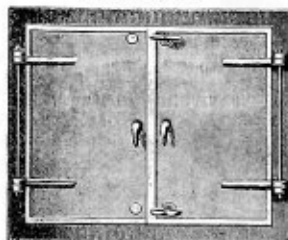


FIG. 734

18 x 30 inches	30 x 30 inches
20 x 36 "	30 x 36 "
24 x 30 "	36 x 36 "
24 x 36 "	28 x 54 "
24 x 42 "	

NIAGARA OIL METERS

PATENTED



FIG. 735

Niagara Oil Meters are used to measure the oil unloaded from tank cars, the flow of oil to burners or the oil drawn from tanks and barrels in stock rooms. They will operate on pressures of a pound or more per square inch and on oil of any temperature and thus are suitable for use under almost all conditions.

Their outside casing is made of galvanized cast iron and their works of bronze and aluminum. The larger gears revolve on jewel and pivot bearings which reduce friction and wear and increase the meter's accuracy. They have a straight reading dial indicating gallons as illustrated above. The circular hand may be made to set back at an extra charge of \$2.00.

A Special Strainer should be used to protect the meter when measuring crude oil and other oils from which grit and dirt collect rapidly.

PRICE LIST

*Capacity for Continuous Rates of Flow Per Hour, U. S. Gals.	Size of Meter	†Minimum Pressure Under Which Meter Will Operate, Lbs. Per Sq. In.	‡Size and Kind of Pipe Connections	Price of Meter, Including Couplings	Price of Special Strainer
6 to 300	A	1	½ in. Unions	\$20.00	\$3.60
10 to 500	B	1	½ in. or ¾ in. "	20.00	4.00
30 to 1000	C	1	¾ in. or 1 in. "	30.00	4.00
60 to 2000	D	2	1 in. or 1¼ in. "	40.00	7.20
90 to 3000	EV	2	1¼ in. or 1½ in. "	60.00	12.00
120 to 4000	E	2	1½ in. or 1½ in. "	80.00	21.00
175 to 6000	F	3	1½ in. or 2 in. "	120.00	30.60
250 to 9000	G	3	2 in. or 2½ in. "	160.00	40.50
250 to 9000	G	3	3 in. Flanges	200.00	48.60

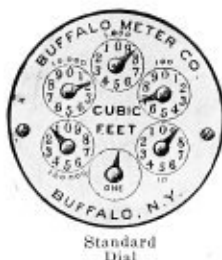
*These minimum quantities are the smallest rates of flow which the meters should be expected to measure accurately. The maximum quantities are the highest rates of flow for continuous operation without undue wear. Meters used only occasionally may be safely operated on flows twice the maximum quantities.

†The size of meter required is not determined by the size of pipe on which it is to be set but by the flow to be measured.

‡The pressure may be supplied by pump, gravity or air pressure. The meters will work on any pressure above the minimum for their respective sizes.

NIAGARA WATER METERS

PATENTED



Standard
Dial

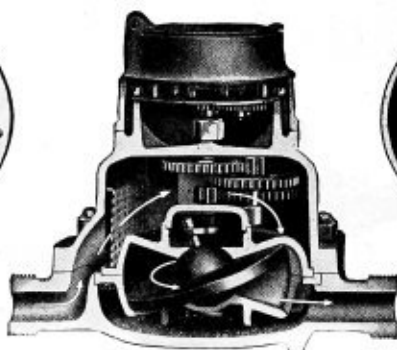


FIG. 736



Straight
Reading
Dial

The Niagara Meter has the outer casing made of a fine grade of cast iron, carefully galvanized. When a meter is frozen, one half of the outer case usually breaks, thus relieving the inner and more expensive parts from injurious strain.

The works are carefully made on the interchangeable plan from bronze composition, hard brass, hard rubber, and German silver; they are protected by an internal strainer.

The measuring chamber is of large capacity, and is fitted with a strong, reinforced hard rubber measuring disc.

The intermediate gears revolve on protected jewel bearings which reduce friction and wear, and prevent dirt from entering the gear bearings. The ball bearing of the disc is also capped over and thus protected from sand and sediment.

The flow of water through the meter is downward, which tends to flush out all foreign material.

Niagara Meters contain only seven submerged working parts and these parts are removable from the outer casing immediately upon opening the meter at the bolted flange.

The meters may have either standard or straight reading dials, indicating cubic feet or gallons at buyer's option.

A meter may be buried in the ground and the dial elevated to the surface by an extension and protected by a cast iron curb box. Extension, any length up to four feet, \$4.00. Curb Box.....\$2.50

Meters can be furnished with all bronze casings, or with bronze main casings and galvanized cast iron bottoms at special prices.

PRICE LIST

Size of Meter Inches	Price of Meter only	Price of Couplings Extra	Greatest Proper Capacity per Min.		Inches High	Inches Long Meter only	Inches Long Including Couplings	Weight with Couplings Boxed Lbs.
			U. S. Gals.	Cu. Ft.				
$\frac{1}{2}$ x $\frac{1}{2}$	\$16.00	\$1.00	22½	3	6½	7¾	12½	14
$\frac{3}{4}$ x $\frac{3}{4}$	16.00	1.50	22½	3	6½	7¾	12½	14
$\frac{1}{2}$	24.00	1.50	37½	5	6¾	9	14	20
1	32.00	2.00	60	8	7½	10½	16	28
1½	48.00	3.00	90	12	8¾	11¼	17	40
1½	64.00	4.00	120	16	10	13	19	60
2	96.00	6.00	180	24	11	15	21	100
2½	128.00	8.00	240	32	12	18	24	150
3	160.00	*	300	40	13½	23	....	200

*Flanges, no charge.

Keystone

WATER METERS

Eureka



FIG. 737



FIG. 738

TYPE "W" KEYSTONE METERS

Size Inches	Prices	Deliv. per Min. Safe Max.		Dimensions			Weight	
		Cu. Ft.	U. S. Gal.	Length Inches	Width Inches	Height Inches	Net Lbs.	Boxed Pounds
$\frac{5}{8}$	\$20.00	$2\frac{2}{3}$	20	7 $\frac{1}{2}$	$5\frac{1}{8}$	$6\frac{1}{2}$	$8\frac{1}{2}$	6-64
$\frac{5}{8} \times \frac{3}{4}$	20.00	$2\frac{2}{3}$	20	7 $\frac{1}{2}$	$5\frac{1}{8}$	$6\frac{1}{2}$	$8\frac{1}{2}$	6-64
$\frac{3}{4}$	30.00	4	30	9	$6\frac{1}{2}$	$7\frac{1}{2}$	$14\frac{1}{2}$	5-94
1	44.00	8	60	$10\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	20	3-52

KEYSTONE WATER METERS

$\frac{5}{8}$	\$20.00	$3\frac{1}{3}$	25	7 $\frac{1}{2}$	$6\frac{1}{8}$	7 $\frac{1}{2}$	11	6-85
$\frac{5}{8} \times \frac{3}{4}$	20.00	$3\frac{1}{3}$	25	7 $\frac{1}{2}$	$6\frac{1}{8}$	7 $\frac{1}{2}$	11	6-85
$\frac{3}{4}$	30.00	$4\frac{2}{3}$	35	9	$6\frac{1}{2}$	$8\frac{1}{2}$	15	4-80
1	44.00	$8\frac{2}{3}$	65	$10\frac{1}{2}$	$8\frac{1}{2}$	$8\frac{1}{2}$	22	3-90
$1\frac{1}{4}$	60.00	10	75	$11\frac{1}{4}$	$9\frac{1}{2}$	$9\frac{1}{2}$	40	50
$1\frac{1}{2}$	80.00	14	105	$12\frac{1}{2}$	$10\frac{1}{2}$	12	50	65
2	120.00	22	165	14	$12\frac{1}{2}$	$12\frac{1}{2}$	65	90
3	240.00	40	300	24	$18\frac{3}{4}$	$17\frac{1}{4}$	225	315
4	400.00	80	600	30	$25\frac{1}{2}$	$19\frac{1}{2}$	505	600
6	800.00	120	900	36	$31\frac{1}{4}$	25	1000	1150

NOTE— $\frac{5}{8} \times \frac{3}{4}$ inch meters are furnished with $\frac{3}{4}$ -inch connections as a convenience for installation on $\frac{3}{4}$ -inch domestic service.

EUREKA WATER METERS

The Eureka Meter is a current or inferential meter, whose particular field includes severe services requiring large volumes of water with little or no reduction of line pressure.

Size Inches	Price	Greatest Proper Quantity per Min.		Dimensions			Weight	
		Cubic Feet	U. S. Gals.	Length Inches	Width Inches	Height Inches	Net	Boxed
$1\frac{1}{2}$	\$ 68.00	19	140	14	7 $\frac{3}{4}$	$11\frac{1}{2}$	60	80
2	102.00	32	240	19	9	$12\frac{1}{2}$	100	130
3	204.00	72	540	24	$10\frac{1}{2}$	$15\frac{1}{4}$	190	230
4	340.00	128	960	30	$14\frac{1}{2}$	$18\frac{3}{4}$	400	450
6	680.00	288	2160	36	$19\frac{1}{4}$	$23\frac{1}{4}$	745	800
8	1020.00	550	4125	$48\frac{3}{4}$	25	21	1625	1725
10	1360.00	800	6000	57	$31\frac{1}{2}$	$33\frac{3}{4}$	3025	3125
12	1700.00	1000	7500	68	$31\frac{1}{2}$	34	3100	3200

No charge for connections.

Prices of larger sizes on application.

SKINNER VALVE RE-SEATING TOOLS



FIG. 739

These tools have a place in every plant that uses Globe and Angle Valves, paying for themselves on the first few valves saved without disconnecting from the pipes, and will last a lifetime.

By using the bonnet of the valve with our taper bushing for a guide at the top, and the guide in the opening of the valve at the bottom, a perfect alignment is assured.

The cutters embody the well known principle of a shear cut, with ample clearance, for both flat and taper seats, and will not chatter. They do not grind but cut the seat, leaving it smooth and polished. It requires very little pressure to operate, and the same valve seat may be re-cut many times. It is so simple that any mechanic can operate it.

The tools are highly polished and packed in neat varnished wooden boxes.



FIG. 740

PRICE LIST

Set of Tools for $\frac{1}{2}$ -inch to 2-inch valves complete.....	\$20.00
Set of Tools for $\frac{1}{2}$ -inch to 3-inch valves complete.....	30.00

SKINNER BIBB RE-SEATER

FOR RE-SEATING COMPRESSION BIBBS

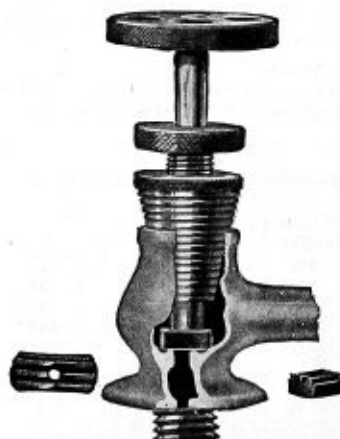


FIG. 741

You simply slip off the bonnet of the leaky faucet—insert the tool (fitted with proper cutter)—turn the feed-screw down until the cutter rests lightly on the bibb seat. Then turn the wheel steadily, forcing the cutter down slowly, unyieldingly, surely, with occasional slight twists of the feed screw. "Very little is enough."

Has three cutters for $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$ and $\frac{3}{4}$ -inch bibbs.

List priceeach, \$2.50

DEXTER VALVE RESEATING MACHINES

are known wherever valves are used and are the result of twenty-five years specializing in tools for repair of valves.

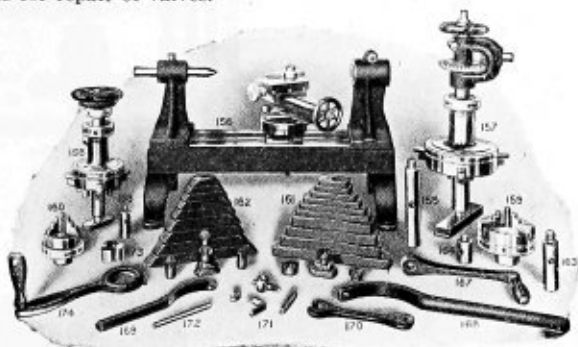


FIG. 742

Outfit No. 6 T-L, capacity for reseating valves $\frac{1}{4}$ to 6 inches.

The Dexter Machines recut a worn valve seat and disc accurately, making a perfectly tight valve that will hold water or steam. The same valve can be recut from ten to twenty times. The saving of a few valves pays for a machine. Extensively used in mines, sugar mills, public institutions, railroads, boats and manufacturing plants.

NET PRICES FOR OUTFITS FOR FLAT AND TAPER-SEATED GLOBE VALVES

Outfit Number.....	3 T-L	4 T-L	6 T-L	8 T-L	10 T-L	12 T-L
For Valves.....sizes	$\frac{1}{4}$ -3	$\frac{1}{4}$ -4	$\frac{1}{4}$ -6	$\frac{1}{4}$ -8	$\frac{1}{4}$ -10	$\frac{1}{4}$ -12
Price	\$87.50	\$102.50	\$137.50	\$187.50	\$262.50	\$337.50

DEXTER PUMP VALVE RESEATING MACHINES

These machines recut the seats in all types of feed water, circulating and service pumps.

Price of Pump Outfits used independently of Dexter Globe Valve Machines:

Outfit Number.....	K-4	H-6	D-H-6
Capacity for Refacing Seats.....	2-3	2-4	2-7 $\frac{1}{2}$
Price, without Cutters.....	\$22.50	\$30.00	\$37.00

PRICE OF PUMP ATTACHMENTS

Used with Dexter Globe Valve Reseating Machines.

Attachment Number.....	M-4	M-6	D-M-6
Capacity for Refacing Seats.....	2-3	2-4	2-7 $\frac{1}{2}$
Price, without Cutters.....	\$15.00	\$17.00	\$24.00

Add price of Pump Cutters required to price of Pump Outfit or Attachment.

PRICE OF S. & W. PATENT PUMP VALVE SEAT CUTTERS

Size .....inches	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$	5	5 $\frac{1}{2}$	6	6 $\frac{1}{2}$	7	7 $\frac{1}{2}$
Price	\$12.00	12.00	12.00	15.00	15.00	15.00	18.00	18.00	18.00	22.00	22.00	22.00

Give diameter of pump valve stud for each cutter.

Dexter Pump Outfits and Cutters can also be supplied for pump valve seats up to 14 inches.

Prices of DEXTER GATE VALVE RESEATING MACHINES, capacity for refacing gate valves 2" to 14", on request.

MUELLER PIPE TAPPING MACHINES

Gas Tapping No. "H"

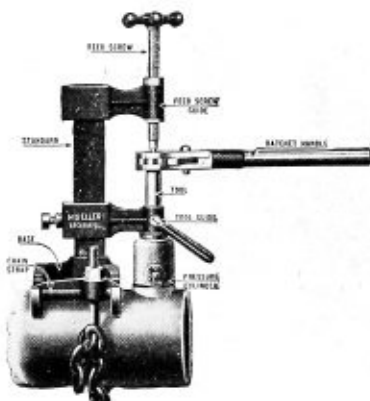


FIG. 743

Water Tapping No. "A" and "B"

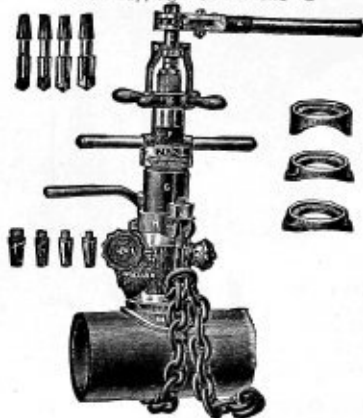


FIG. 744

MUELLER GAS TAPPING MACHINE NO. "H"

For tapping dry and open mains, or mains under pressure. With suitable tools this machine will make taps from $\frac{3}{8}$ inch to 2 inch size in pipe under pressure. If the gas cylinder is removed it will make taps from $\frac{3}{8}$ inch to 3 inches in an open pipe of any size.

Price, Machine "H," list, each, with standard equipment.....\$42.00

Standard Equipment, Ratchet Handle complete, Wrench, Chain for pipe up to 12 inches, Rubber Saddles for 4, 6 and 8 inch C. I. pipe, Gas Cylinder and Rubber Gasket, but no tools. When tools are ordered they will be furnished with I. P. thread unless otherwise specified.

Price, Machine "H," list, each, less gas cylinder and saddles.....\$37.00

Optional Equipment. Upon specification option will be given of Rubber Saddles for any other size pipe. Extension Chain for increasing the length of Standard Chain will be furnished at an additional cost upon specification.

MUELLER WATER TAPPING MACHINE NO. "A"

With a complete equipment of tools, this machine will make taps and insert corporation cocks from 1 inch to 2 inch size in pipe under pressure. When the pressure exceeds 90 pounds, a Power Clevis must be used.

Standard Equipment, Ratchet Handle with extension; Combined Feed Nut and Yoke; Tools with MUELLER Threads; sizes, 1 inch, $1\frac{1}{4}$ inch, $1\frac{1}{2}$ inch and 2 inch. Plugs, male screw; sizes, 1 inch, $1\frac{1}{4}$ inch, $1\frac{1}{2}$ inch and 2 inch. Iron Saddles for 8 inch, 10 inch, 12 inch and 16 inch C. I. Pipe. Rubber Gaskets for all sizes of C. I. pipe; Flat Link Chain for 6 inch to 16 inch pipe. Body cleaning Chisel; Wrench for $1\frac{1}{4}$ inch, $1\frac{1}{2}$ inch and 2 inch cocks.

Optional Equipment, Tools with I. P. Thread instead of MUELLER Thread; Plugs, female screw instead of male screw; same for larger size pipe than 16 inch.

Price, No. "A" Machine.....\$200.00

MUELLER WATER TAPPING MACHINE NO. "B"

With a complete equipment of tools this machine will make taps and insert corporation cocks from $\frac{3}{8}$ inch to 1 inch size in pipe under pressure and will make taps only from 1 inch to 2 inch in open or dry pipe, but will not insert a cock above 1 inch.

Standard Equipment, Ratchet Handle, Combined Feed Nut and Yoke; Tools with MUELLER Threads $\frac{1}{2}$ inch, $\frac{5}{8}$ inch, $\frac{3}{4}$ inch. Plugs male screw sizes, $\frac{1}{2}$ inch, $\frac{5}{8}$ inch, $\frac{3}{4}$ inch. Iron saddles for 4 inch, 6 inch, 8 inch and 10 inch C. I. pipe. Small Rubber Gasket for top of Saddles; Large Rubber Gasket for all size of cast or wrought iron pipe; Chain for pipe up to 12 inch. Chain Wrench; Body Cleaning Chisel.

Optional Equipment, Tools with I. P. thread; Plugs female screw except $\frac{3}{8}$ inch instead of male screw. 4 Saddles for any size of cast iron pipe. Chain for any size pipe larger than 12 inch.

Price, No. "B" Machine.....\$130.00

CHESTERTON'S GAGE GLASS CUTTER



FIG. 745

The cutter enables the sliding lever to be placed close to the work, and thus more power is obtained than in any other cutter, and the steel cutting wheel can be used a long time. Price, nickel plated.....Each \$2.00

FLETCHER GAGE GLASS CUTTER



FIG. 746

Made of spring steel, nickel-plated, with stub steel pin and Jessop steel cutting wheel. PriceEach \$1.00

WORCESTER GAGE GLASS CUTTER



FIG. 747

PriceEach \$1.00

GAGE GLASS WASHERS

Gilbert's Self-Packing
Preserver

Square



FIG. 748



FIG. 749

SQUARE WASHERS

Size	Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1
Price, Square	Dozen	\$0.25	.25	.25	.35	.50
Price, Square, Extra Heavy	Dozen	.50	.50	.50	.70	1.00

GILBERT'S PRESERVERS

No.	1	2	3	4	5	6	7
Size	Inches	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1 or $1\frac{1}{4}$	$\frac{5}{8}$	$\frac{3}{4}$
Depth of Cushion	Inches	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
Width of Cushion	Inches	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{5}{8}$	$\frac{3}{4}$
Price	Per doz.	\$0.75	.75	.75	.75	.75	.75

RAINBOW RED GAGE GLASS WASHERS

Size	Inches	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{5}{8}$	1
Per gross		\$2.50	2.75	3.00	3.25	3.50

BISHOP'S "ADAMANT" GAGE GLASSES



FIG. 750

No matter how high the pressure, how great the heat or what has been the variation in temperature, Bishop's Adamant Gage Glasses have never been known to break. This is a record that means something to every user of gage glasses. They are safe, for they prevent accidents to workmen. They are economical to use, as they save time and money by giving longer service and they don't have to be replaced, saving the cost of renewal of washers as well as glasses. If you want SAFETY, DURABILITY, TRANSPARENCY and ECONOMY in gage glasses, specify Bishop's Adamant.

Length	inches	10	11	12	13	14	15	16	17	18
$\frac{1}{2}$ and $\frac{3}{4}$ inch.....dozen	\$	3.00	3.24	3.00	3.84	4.20	4.44	4.80	5.04	5.40
$\frac{3}{4}$ inch	dozen	3.60	3.96	4.32	4.80	5.16	5.52	5.88	6.24	6.60
$\frac{1}{2}$ inch	dozen	5.04	5.64	6.12	6.60	7.08	7.56	8.16	8.64	9.12
1 inch	dozen	6.12	6.72	7.32	7.92	8.52	9.12	9.72	10.32	10.92
Length	inches	19	20	22	24	30	36	48	60	72
$\frac{1}{2}$ and $\frac{3}{4}$ inch.....dozen	\$	5.64	6.00	6.60	7.20	9.00	10.80	14.52	18.12	21.84
$\frac{3}{4}$ inch	dozen	7.08	7.44	8.16	8.88	11.16	13.44	18.00	22.56	27.12
$\frac{1}{2}$ inch	dozen	9.60	10.20	11.16	12.12	15.24	18.24	24.36	30.48	36.48
1 inch	dozen	11.52	12.12	13.44	14.64	18.24	21.96	29.16	36.48	43.80

60x1 $\frac{1}{4}$ inches, per dozen, \$60.00.

* 72x1 $\frac{1}{2}$ inches, per dozen, \$108.00.

MONCRIEFF'S PERTH GAGE GLASSES



FIG. 751

Length	inches	10	11	12	13	14	15	16	17	18
$\frac{1}{2}$ and $\frac{3}{4}$ inch.....dozen	\$	3.00	3.24	3.00	3.84	4.20	4.44	4.80	5.04	5.40
$\frac{3}{4}$ inch	dozen	3.60	3.96	4.32	4.80	5.16	5.52	5.88	6.24	6.60
$\frac{1}{2}$ inch	dozen	5.04	5.64	6.12	6.60	7.08	7.56	8.16	8.64	9.12
1 inch	dozen	6.12	6.72	7.32	7.92	8.52	9.12	9.72	10.32	10.92
Length	inches	19	20	22	24	30	36	48	60	72
$\frac{1}{2}$ and $\frac{3}{4}$ inch.....dozen	\$	5.64	6.00	6.60	7.20	9.00	10.80	14.52	18.12	21.84
$\frac{3}{4}$ inch	dozen	7.08	7.44	8.16	8.88	11.16	13.44	18.00	22.56	27.12
$\frac{1}{2}$ inch	dozen	9.60	10.20	11.16	12.12	15.24	18.24	24.36	30.48	36.48
1 inch	dozen	11.52	12.12	13.44	14.64	18.24	21.96	29.16	36.48	43.80

60x1 $\frac{1}{4}$ inches, per dozen, \$60.00.

72x1 $\frac{1}{2}$ inches, per dozen, \$108.00.

WATER GAGES

Type W



FIG. 752

Reflex Type



FIG. 753

By furnishing us distance between packing nut faces, we will furnish these Water Gages to suit old boiler fittings. Unless otherwise specified we will furnish $\frac{3}{8}$ inch stems. We can furnish $\frac{1}{2}$ inch and $\frac{3}{4}$ inch stems to suit fitting which formerly had $\frac{1}{2}$ inch and $\frac{3}{4}$ inch tubular glasses.

PRICES EITHER ABOVE TYPES

No.	Length of Body	Length of Observation Glass	Distance Between Nuts of Stuffing Boxes	Plain Gage	Gage with Fittings	Extra Glasses, Each,
0	4½ in.	2¾ in.	6 — 7 in.	\$10.00	\$26.00	\$3.15
1	5¾ in.	3¾ in.	7 — 8 in.	12.00	28.00	3.30
2	6¾ in.	4¾ in.	8 — 9 in.	16.00	32.00	2.55
3	7¼ in.	5¾ in.	9 — 10 in.	20.00	36.00	2.65
4	8¼ in.	6¾ in.	10 — 11 in.	24.00	40.00	2.80
5	9¾ in.	7¾ in.	11 — 12¼ in.	28.00	44.00	3.15
6	10¾ in.	9¼ in.	12¼ — 13½ in.	32.00	52.00	3.55
7	12 in.	10¾ in.	13½ — 15 in.	40.00	60.00	4.65
8	13½ in.	11¾ in.	15 — 16 in.	45.00	65.00	5.40
9	14¼ in.	12¾ in.	16 in. and over	50.00	70.00	6.75

When ordering always state:

1. Diameter of present glass.
2. Total length of glass now used.
3. Distance between packing nuts.
4. For repairs, always give name of part.

Prices on extra gaskets and other repair parts on application.



FIG. 754

EXPANSION TANK GAGE

No. 1—Bronzed body, two guards. Threaded for $\frac{1}{2}$ -inch iron pipe, glass, $\frac{5}{8}$ x12 inches.....each, \$2.60

"PITTSBURGH" CHAIN LEVER WATER GAGE

FOR HIGH ELEVATIONS

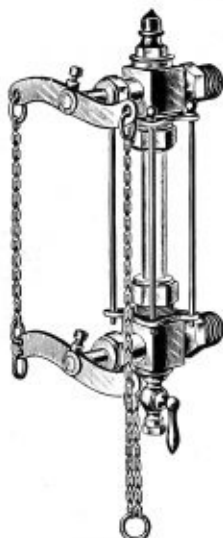


FIG. 755

This Chain Lever Water Gage is intended for use on large boilers where the columns are located some distance from the floor. Horizontal position of the levers indicates that the water gage is open to the boiler. Pulling down on the right-hand chain closes gage to boiler.

If it is desired to bring the drain cock within reach of the engineer, it can be done as follows: Remove the drain cock and screw in its place a piece of $\frac{1}{4}$ inch iron pipe of the proper length. Then attach the drain cock to the lower end of this piece of pipe within reach of the floor.

No.	Size of Glass, Inches	Shank, Inches	Price each. Brass Fin.
53	$\frac{5}{8}$ x12	$\frac{1}{2}$	\$18.00
54	$\frac{3}{4}$ x16	$\frac{3}{4}$	20.00

SELF-CLEANING WATER GAGES

ROUND BODIES

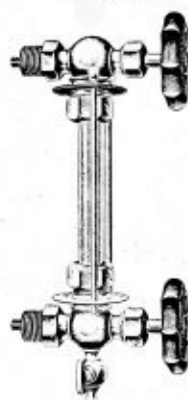
Iron Wheel
Two Guards

FIG. 756

Wood Wheel
Two Guards

FIG. 757

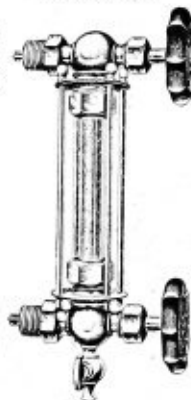
Iron Wheel
Four Guards

FIG. 758

Wood Wheel
Four Guards

FIG. 759

FIG. 756. BRONZED BODY, TWO GUARDS, IRON WHEEL

Boiler Connection,	$\frac{3}{8}$ inch;	Glass,	$\frac{5}{8}$ x 10 inches.	each	\$2.75
"	$\frac{1}{2}$ "	"	$\frac{5}{8}$ x 12 "	"	3.00
"	$\frac{3}{4}$ "	"	$\frac{5}{8}$ x 16 "	"	4.50

FIG. 756. POLISHED BODY, TWO GUARDS, IRON WHEEL

Boiler Connection,	$\frac{3}{8}$ inch;	Glass,	$\frac{5}{8}$ x 10 inches.	each	3.25
"	$\frac{1}{2}$ "	"	$\frac{5}{8}$ x 12 "	"	3.75
"	$\frac{3}{4}$ "	"	$\frac{5}{8}$ x 16 "	"	4.75

FIG. 757. POLISHED BODY, TWO GUARDS, WOOD WHEEL

Boiler Connection,	$\frac{3}{8}$ inch;	Glass,	$\frac{5}{8}$ x 10 inches.	each	3.75
"	$\frac{1}{2}$ "	"	$\frac{5}{8}$ x 12 "	"	4.25
"	$\frac{3}{4}$ "	"	$\frac{5}{8}$ x 16 "	"	5.50

FIG. 758. POLISHED BODY, FOUR GUARDS, IRON WHEEL

Boiler Connection,	$\frac{1}{2}$ inch;	Glass,	$\frac{5}{8}$ x 12 inches.	each	4.50
"	$\frac{3}{4}$ "	"	$\frac{5}{8}$ x 16 "	"	5.50

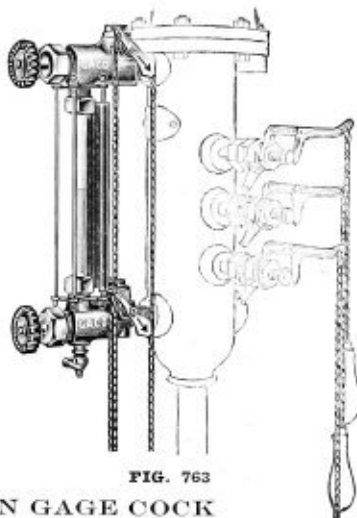
FIG. 759. POLISHED BODY, FOUR GUARDS, WOOD WHEEL

Boiler Connection,	$\frac{1}{2}$ inch;	Glass,	$\frac{5}{8}$ x 12 inches.	each	5.00
"	$\frac{3}{4}$ "	"	$\frac{5}{8}$ x 16 "	"	6.25

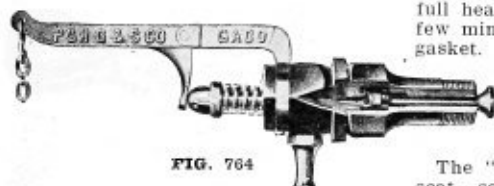
"GACO" SELF-CLOSING SAFETY WATER GAGE

Thousands of dollars are lost by escaping steam and water caused by broken glasses in unreliable water gages. This cannot happen where the "Gaco" Self-Closing Gage is used, as it cannot be closed by outward means, but closes instantly when glass breaks, thus preventing false water level, which is automatically maintained when glass breaks.

Cut shows water column and Take-Down Gage Cocks.

**FIG. 763****"GACO" TAKE-DOWN GAGE COCK**

This Cock can be taken down under a full head of pressure and repaired in a few minutes by replacing protected disc gasket.

**FIG. 764**

The "GACO" has a double removable seat, so that when taking down, the inner seat closes, keeping the steam and water in the boiler while repairing gaskets. No regrinding required.

The spring and stuffing box are so arranged as to keep the seat positively closed, packing in place and prevents leakage in outer stem.

It has an adjustable lever to enable attendant to operate in any angle desired, from the floor.

PRICE LIST—"GACO" SELF CLOSING SAFETY WATER GAGES

Style Finish	Size Connections, Inches	Size Gage Glass, Inches	Price Complete
Plain Body	$\frac{1}{2}$	$\frac{3}{4}$	\$20.00
Plain Body	$\frac{3}{4}$	$\frac{3}{4}$	20.00
Polished	$\frac{1}{2}$	$\frac{3}{4}$	22.00
Polished	$\frac{3}{4}$	$\frac{3}{4}$	22.00
Nickel Plated	$\frac{1}{2}$	$\frac{3}{4}$	24.00
Nickel Plated	$\frac{3}{4}$	$\frac{3}{4}$	24.00
Brass Flange	$\frac{3}{4}$	B. & W. Flange, per set	2.00

"GACO" TAKE-DOWN GAGE COCKS

Polished	$\frac{1}{2}$	Per Set of Three	\$13.50
Polished	$\frac{3}{4}$	Per Set of Three	13.50
Nickel Plated	$\frac{1}{2}$	Per Set of Three	15.00
Nickel Plated	$\frac{3}{4}$	Per Set of Three	15.00

GAGE COCKS

BINGHAM SELF-GRINDING ROTATING GAGE COCK



FIG. 765

Size of shank, pipe thread $\frac{1}{2}$ -inch or $\frac{3}{4}$ -inch.....per doz., \$16.00

With Lever

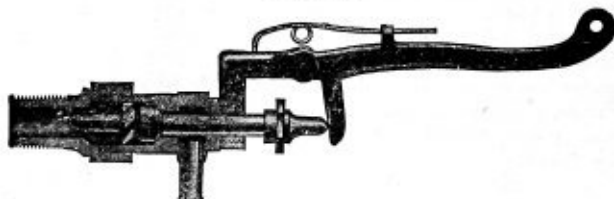


FIG. 766

Size of shank, pipe thread $\frac{1}{2}$ -inch or $\frac{3}{4}$ -inch.....per doz., \$16.00

Plain Soft Seat Compression
Gage Cock

Soft Seat Compression Gage
Cock with Stuffing Box

Ball Gage Cock



FIG. 767

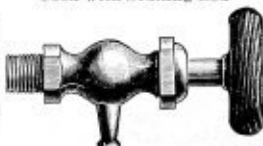


FIG. 768



FIG. 769

Cut for Pipe Thread	inch	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
Soft Seat Compression Gage Cock	each	\$0.95	\$1.00	\$1.25
Soft Seat, with Stuffing Box	"	1.20	1.30	1.45
Ball Gage Cock	"	1.00	1.00	1.00

SELF-CLEANING LOCOMOTIVE GAGE COCKS

WITH NICKEL SEATS



FIG. 770

These Gage Cocks are heavy and strong, and have self-cleaning attachments. The nickel seats are non-corrosive, and, being very hard, render the Gage Cocks practically indestructible. They are made more especially for locomotive use.

$\frac{3}{4}$ -inch, brass.....price each \$3.00

STEAM GAGE COCKS

No. 8. Lever Handle, Male
Union and Female End



No. 9. Tee Handle,
Female Ends



No. 10. Tee Handle, Male
and Female Ends



Number	1	2	3
Size of Shank Pipe Thread.....inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
No. 9. T. H. Steam Gage Cock, Female Ends .....each	.75	.85	.95
No. 10. T. H. Steam Gage Cock, Male and Female Ends....."	.75	.85	.95
No. 8. L. H. Steam Gage Cock, with Union....."	1.40	1.50	1.60

Size of Shank Pipe Thread.....	inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
No. 9. T. H. Steam Gage Cock, Female Ends.....	each	.75	.85	.95
No. 10. T. H. Steam Gage Cock, Male and Female Ends.....	"	.75	.85	.95
No. 8. L. H. Steam Gage Cock, with Union.....	"	1.40	1.50	1.60



SYPHONS FOR STEAM GAGES

Iron Pipe Syphon, Straight or Angle.....	\$0.30
Polished Brass Syphon, Straight or Angle..	1.25

Polished Brass Syphon, Straight or Angle.. 1.25

SYPHON COCKS FOR STEAM GAGES

Are especially adapted for Portable and Traction Engines, and for cases where the Syphon has to support the Gage.

No. 14



No. 12



No. 19



No. 15



PRICES

PRICES		Brass	N. P.
Straight Syphon, without Cock, No. 12		1.00	1.50
Elbow	" " " "	1.25	1.75
Straight	with " " "	1.50	2.00
Elbow	" " " "	1.50	2.00

Elbow	13	1.25	1.75
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Straight	"	with	"	"	14	1.50	2.00
"	"	"	"	"	15	2.50	3.00

Elbow	19.....	1.50	2.00
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HYDRAULIC CHECK AND NEEDLE STOP VALVES

FOR RECORDING HYDRAULIC GAGES

Unless otherwise ordered the connection of gages as well as valves is $\frac{1}{2}$ inch straight pipe thread and a copper washer is furnished with gage and valves for end packing.

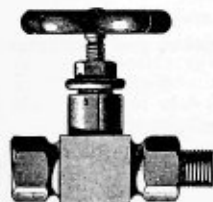


Fig. 779. Needle Stop Valve...each, 10.00



Fig. 780. Valve to protect gages against damage arising from sudden removal of pressure...each. 8.00

THE "PITTSBURGH" SINGLE SPRING BOURDON STEAM AND PRESSURE GAGES

SPRINGS OF SOLID DRAWN TUBE

Sectional

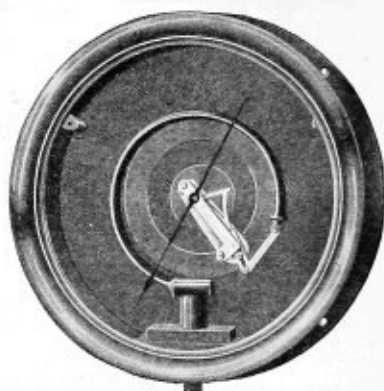
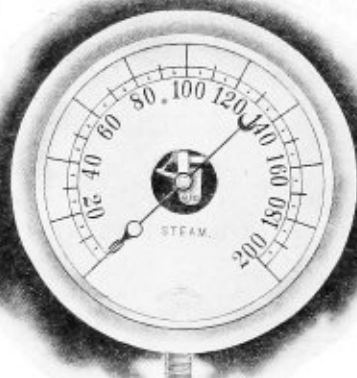


FIG. 781

PRICES INCLUDING COCK

Size	Iron Case, Brass Ring	Iron Cases, N. P. Ring	Brass Case	N. P. Case
3 Inch Dial	\$6.00	\$6.15	\$8.00	\$8.60
3½ " "	7.00	7.18	9.00	9.75
4½ " "	8.00	8.20	10.00	11.00
5 " "	8.00	8.20	11.00	12.00
5½ " "	10.00	10.25	12.00	13.25
6 " "	13.00	13.50	16.00	17.50
6½ " "	16.00	16.60	20.00	22.00
8½ " "	22.00	22.75	30.00	32.50
10 " "	32.00	33.00	40.00	43.00
12 " "	50.00	51.50	75.00	79.00

In ordering always state **size** wanted, whether **brass** or **iron case**, and **maximum pressure**.

All gages graduated from an open mercury column.

Name on dials of gages free of charge when ordered in quantities.

An allowance of ten cents each will be made for cocks if not wanted.

Special net prices on sizes below 5½ inches when ordered in quantities.

A Syphon must be used with these gages.

THE "PITTSBURGH"
DOUBLE SPRING BOURDON STEAM AND PRESSURE
GAGES

SPRINGS OF SOLID DRAWN SEAMLESS TUBE

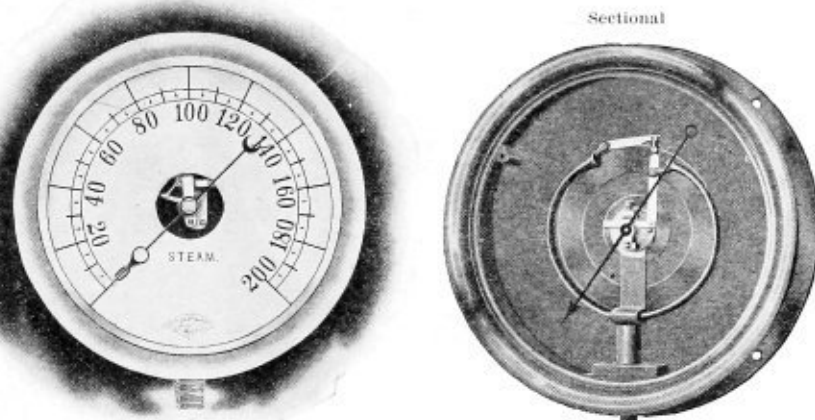


FIG. 782

PRICES INCLUDING COCK

Size	Iron Case, Japanned	Iron Case, N. P. Ring	Brass Case	N. P. Case
4½ Inch Dial	\$10.00	\$10.20	\$12.00	\$13.00
5 " "	11.00	11.20	13.00	14.00
5½ " "	12.00	12.25	14.00	15.25
6 " "	15.00	15.50	18.00	19.50
6¾ " "	18.00	18.60	22.00	24.00
8½ " "	25.00	25.75	34.00	36.50
10 " "	37.00	38.00	45.00	48.00
12 " "	55.00	56.50	80.00	84.00

Please state **size**, **pressure** and whether **iron** or **brass case**.

This Gage is made with the Lane Improvement of the Double Spring and is much preferable to the ordinary single-spring gage. Many of the objectionable features of the Bourdon Gage are obviated in this gage, there being no vibration of the hand, and with the short springs prevents freezing up in case of exposure.

Well adapted for Locomotives, Marine and Portable Boilers.

Every Gage tested accurately from mercury columns.

No extra cost for name on dials when ordered in quantities.

A syphon must invariably be used.

THE "PITTSBURGH"
IMPROVED VACUUM GAGES

SPRINGS OF SOLID DRAWN TUBE

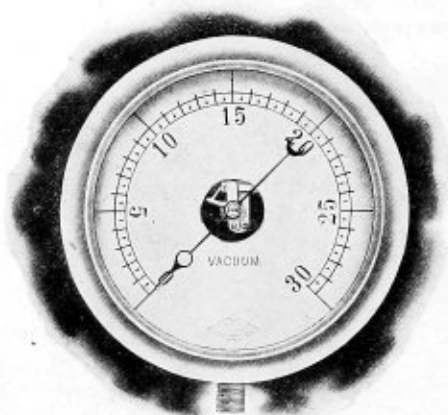


FIG. 783

The Pittsburgh Improved Vacuum Gages are graduated to indicate vacuum in square inches of mercury.

30 Inches equals about 15 pounds.

PRICES INCLUDING COCK

Size	Iron Case, Brass Ring	Iron Case, N. P. Ring	Brass Case	N. P. Case
3 Inch Dial.....	\$6.00	\$6.15	\$8.00	\$8.60
3½ " "	7.00	7.18	9.00	9.75
4½ " "	8.00	8.20	10.00	11.00
5 " "	8.00	8.20	11.00	12.00
5½ " "	10.00	10.25	12.00	13.25
6 " "	13.00	13.50	16.00	17.50
6¾ " "	16.00	16.60	20.00	22.00
8½ " "	22.00	22.75	30.00	32.50
10 " "	32.00	33.00	40.00	43.00
12 " "	50.00	51.50	75.00	79.00

IN ORDERING ALWAYS STATE WHETHER BRASS OR IRON CASE IS DESIRED

THE "PITTSBURGH" COMPOUND PRESSURE AND VACUUM GAGES

SPRINGS OF SOLID DRAWN TUBE

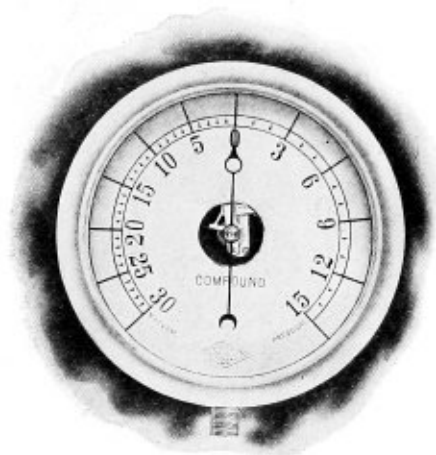


FIG. 784

These Gages for indicating either pressure or vacuum, are graduated for pressure in pounds per square inch, and for vacuum in inches of mercury column, fifteen pounds pressure being equal to about thirty inches of vacuum. If a pressure exceeding fifteen pounds is required it should be stated in ordering.

PRICES INCLUDING COCK

Size.	Iron Case, Japanned	Iron Case, N. P. Ring	Brass Case	N. P. Case
3½ inch Dial.....each	\$10.00	\$10.18	\$12.00	\$12.75
4½ " " " " " "	12.00	12.20	14.00	15.00
5½ " " " " " "	14.00	14.25	16.00	17.25
6 " " " " " "	16.00	16.50	20.00	21.50
6¾ " " " " " "	20.00	20.60	25.00	27.00
8½ " " " " " "	30.00	30.75	40.00	42.50
10 " " " " " "	40.00	41.00	50.00	53.00
12 " " " " " "	60.00	61.50	80.00	84.00

Always use a syphon, so that nothing but water will enter the gage.

THE "PITTSBURGH" HYDRAULIC GAGES

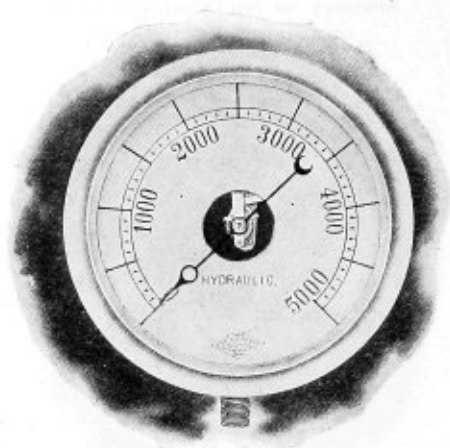


FIG. 785

Our Hydraulic Gages are made with special steel tube for high pressures, and are accurately and carefully tested.

When ordering state maximum pressure required, and if dial is to show pressure in tons on ram, give exact diameter of ram.

PRICES WITHOUT COCKS

Size	Iron Case, Brass Ring	Iron Case, N. P. Ring	Brass Case	N. P. Case
5 inch Dial each	\$30.00	\$30.50	\$35.00	\$36.00
6 " " "	35.00	35.50	40.00	41.50
6 $\frac{3}{4}$ " " "	50.00	50.60	60.00	62.00
8 $\frac{1}{2}$ " " "	70.00	70.75	80.00	82.50
10 " " "	90.00	91.00	100.00	103.00
12 " " "	110.00	111.50	125.00	129.00

Maximum Hands, \$5.00 each. Hydraulic Check Valves and Cocks extra.

No extra charge for marking tons on Ram on Dials.

THE "PITTSBURGH"
COMBINATION WATER PRESSURE GAGES
SPRINGS OF SOLID DRAWN TUBE



FIG. 786

These Gages are especially adapted for Water Works, Pumping Stations, etc., for indicating the pressure of water in pounds per square inch and the corresponding height of water column. To raise a column of mercury 2.04 inches, or a column of water 27.67 inches requires one pound pressure. Always state, in ordering, the maximum pressure to be carried, or the maximum height of water.

PRICES INCLUDING COCK

Size	Iron Case, Japanned	Iron Case, N. P. Ring	Brass Case	N. P. Case
5½ inch Dial..... each	\$14.00	\$14.25	\$16.00	\$17.25
6 " " " " " " " " " "	16.00	16.50	20.00	21.50
6¾ " " " " " " " " " "	20.00	20.60	25.00	27.00
8½ " " " " " " " " " "	30.00	30.75	40.00	42.50
10 " " " " " " " " " "	40.00	41.00	50.00	53.00
12 " " " " " " " " " "	60.00	61.50	80.00	84.00

THE "PITTSBURGH" PYROMETER STEAM GAGES

NOT ILLUSTRATED

SPRINGS OF SOLID DRAWN TUBE

For indicating pressure of steam in pounds per square inch, and corresponding degrees of heat.

PRICES INCLUDING COCK

Size	Iron Case, Japanned	Iron Case, N. P. Ring	Brass Case	N. P. Case
5½ inch Dial..... each	\$14.00	\$14.25	\$16.00	\$17.25
6 " " " " " " " " " "	16.00	16.50	20.00	21.50
6¾ " " " " " " " " " "	20.00	20.60	25.00	27.00
8½ " " " " " " " " " "	30.00	30.75	40.00	42.50
10 " " " " " " " " " "	40.00	41.00	50.00	53.00
12 " " " " " " " " " "	60.00	61.50	80.00	84.00

In ordering state maximum pressure or temperature required.
 A syphon is indispensable with these Gages.

THE "PITTSBURGH" STANDARD TEST GAGES

SPRINGS MADE OF SOLID DRAWN SEAMLESS TUBE

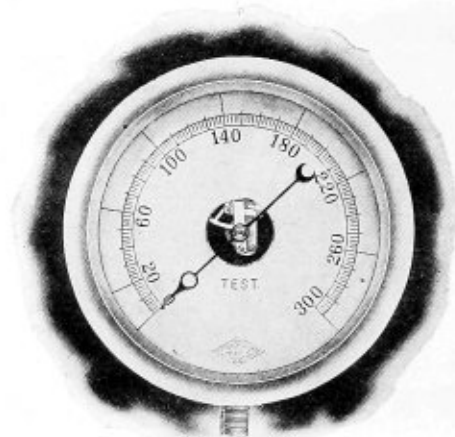


FIG. 787

Our Standard Test Gages are made with the greatest of care and with the best material and workmanship possible in the present state of the art.

Each Gage is most carefully adjusted, tested and graduated by our mercury column and sealed in one pound marks.

For accuracy, sensitiveness and workmanship there are no better gages made.

PRICES INCLUDING COCK

Size	Brass Cases	N. P. Case
3 inch Dial..... each	\$14.00	\$14.60
3 1/2 " " " " " " " " " " " "	14.00	14.75
4 " " " " " " " " " " " "	16.00	17.00
5 1/2 " " " " " " " " " " " "	20.00	21.25
6 " " " " " " " " " " " "	25.00	26.50
6 3/4 " " " " " " " " " " " "	30.00	32.00
8 1/2 " " " " " " " " " " " "	40.00	42.50
10 " " " " " " " " " " " "	50.00	53.00



FIG. 788

GAGE HAND PULLER

Our Gage Hand Puller is a valuable little tool for taking off gage hands. It is very useful for parties using many gages.

Price, \$1.50 Each.

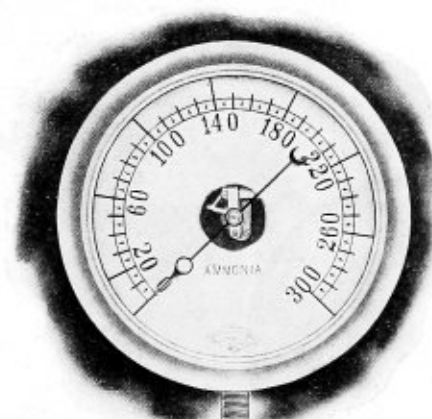


FIG. 789

"PITTSBURGH" AMMONIA GAGES

Our Ammonia Gages are made with all the interior parts of iron, excepting the spring, which is of steel, to withstand ammonia, or any other gas or acid which attacks the ordinary Bourdon spring.

When desired these Gages are made to indicate both pressure and vacuum on the same dial, but ordinarily only show pressure.

Size	Iron Case and Ring	Iron Case, N. P. Ring
6 inch Dial.....each	\$35.00	\$35.50
6 3/4 " " " " " "	40.00	40.60
8 or 8 1/2 " " " " " "	45.00	45.75



FIG. 790

"PITTSBURGH" ALTITUDE GAGES

WITH IMPROVED INDEPENDENT
MOVEMENT

For indicating the Height of Water Column
in feet.

They are provided with a set pointer, and made
with either black or silvered dials. Springs
of solid drawn or brazed tube.

PRICES INCLUDING COCK

Size, Inches	Iron Case, Japanned	Iron Case N. P. or Silver Metal Ring	Brass Case	N. P. or Sil- ver Metal Case	Brass Deep Case, O. G. or Oct. Ring	N. P. or Sil- ver Metal Deep Case	Alumi- num Case
4 1/2 or 5	\$12.00	\$12.20	\$14.00	\$15.00	\$16.00	\$17.00	\$14.00
5 1/2	14.00	14.25	16.00	17.25	18.50	19.75	16.00
6	16.00	16.50	20.00	21.50	23.00	24.50	20.00
6 3/4	20.00	20.60	25.00	27.00	28.00	30.00	25.00
8 1/2	30.00	30.75	40.00	42.50	43.50	46.00	40.00
10	40.00	41.00	50.00	53.00	54.00	57.00	50.00
12	60.00	61.50	80.00	84.00	85.00	89.00	80.00

In ordering, state maximum height of water column. No syphon is required with this gage.

PITTSBURGH OXY-WELDING PRESSURE GAGES

WITH INDEPENDENT NON-CORROSIVE MOVEMENT

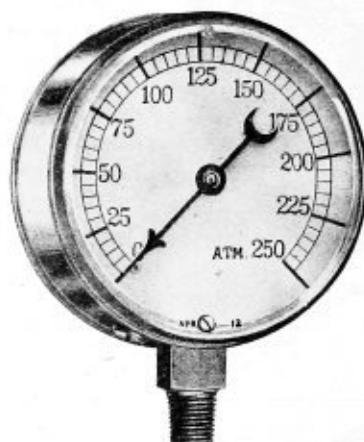


FIG. 791

Pittsburgh Oxy-Welding Pressure Gages are used under high oxygen pressures in connection with acetylene and other gas welding apparatus.

Movements are non-corrosive and mounted direct on socket, and cannot be thrown out of adjustment when gages are being screwed into position. Springs are specially made and tested to stand extreme high pressures. Sockets are fitted with check valves to prevent undue shock to springs from sudden application of pressure. Cases of Oxy-Welding Pressure Gages are heavy cast brass and fitted with patented safety back, releasing (away from operator) any dangerous over-pressure. Standard graduation, 3000 pounds. Frequently graduated in atmospheres as shown. Should be graduated to about double the highest working pressure.

PRICES—EACH

Size	Finished Brass Case	N. P. Case	Pipe Connection
3½ inch Dial	\$26.00	\$26.75	¼ inch Male

INSPECTORS' TESTING AND PROVING OUTFIT

The outfit consists of the following nickel plated instruments: Three-inch Standard Test Gage, Screw Test Pump, Gage Hand Puller, Hand Set, Lever Handle Union Gage Cock and Screw Driver, all neatly and compactly contained in velvet-lined leather case, fitted with lock and handle. The approximate weight of this outfit is eight pounds.

Price, each.....\$45.00



FIG. 792

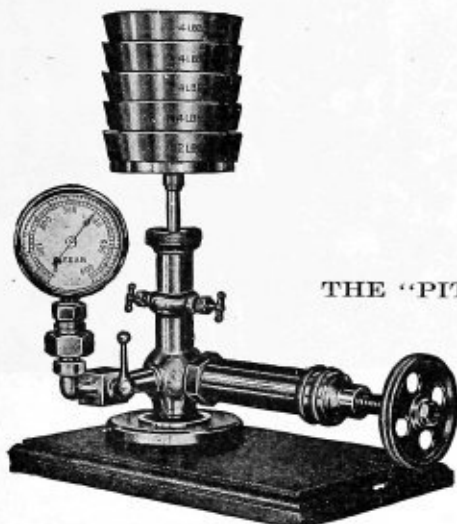


FIG. 793

THE "PITTSBURGH" IMPROVED PRESSURE GAGE TESTER

WITH DOUBLE AREA PISTON FOR WIDE RANGE OF PRESSURE

This is an instrument for accurately testing and correcting pressure gages by means of weights. As a standard for measuring pressures it is equal in accuracy to a mercury column, yet much more convenient and less expensive.

Price, each.....\$130.00

which includes Tester complete, with weights for testing to one thousand pounds, and furnished with Screw Driver, Hand Puller, Hand Set, Oil Can, and six Nipples for attaching gages, all packed in two separate cases provided with substantial handles, so as to be easily carried.

THE "PITTSBURGH" HYDRAULIC PUMP FOR TESTING GAGES

This pump is made entirely of brass, highly polished, or nickel plated.

It is provided with a double cylinder, one inserted into the other. The piston working in the inner cylinder forces the water into the space between this and the outer cylinder, to which the test gage and gages to be tested are connected.

Price, exclusive of Test Gage, Brass Finish.....\$35.00

Price, exclusive of Test Gage, Nickel Plated.....38.00

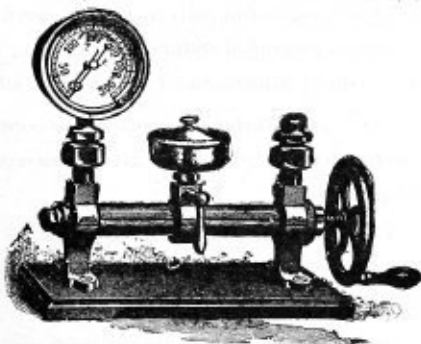


FIG. 794

GAGE REPAIRING

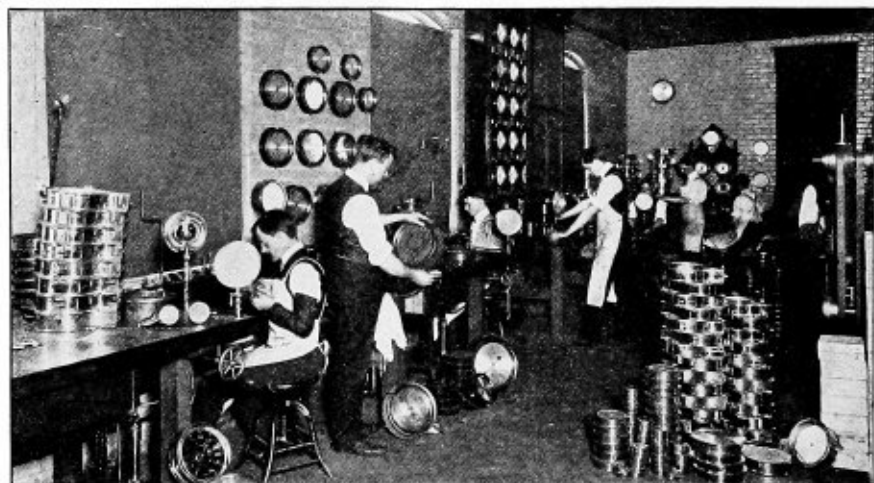


FIG. 795

PARTIAL VIEW OF OUR GAGE REPAIR SHOP

Delicacy of construction and adjustment are essential characteristics of an accurate and sensitive gage. Greater or less derangement and deterioration of the delicate mechanism cannot but result from the comparatively rough usage ordinarily accorded these instruments in general service. Furthermore, even under the best conditions, continued endurance of varying pressure, temperatures, etc., necessarily induce slight alterations of adjustment, affecting the accuracy of the index hand.

Every gage, therefore, upon whose correct indications the safety of lives and property depends, should be given occasional overhauling at the hands of competent persons.

We are exceptionally well equipped for this work and our gage hospital offers every facility for thorough and accurate repair, re-adjustment, refinishing and testing of gages of any make, size and style.

Our provisions for this line of work enable us to do it well, quickly and at very low cost.

"PITTSBURGH" RECORDING PRESSURE AND VACUUM GAGES.

Especially adapted for recording the pressure of Steam, Water, Oil, Gas or Air; also Vacuum. They accurately record upon a chart the exact condition of the pressure or vacuum prevailing at

any hour or minute of the day or night. This information is a valuable aid in promoting the efficiency of the plant. They are arbitrators of all disputes, their decision is just, impartial and unimpeachable.

It is a well known fact that the wear and tear on the Boiler—the strain of expansion and contraction, caused by fluctuations of the steam pressure—directly affect the life of the boiler, as well as its safety. Such fluctuations also directly concern the working efficiency of the engines—the entire plant—as the more uniform the pressure, the more and better the work done.

By making a permanent record of the slightest variation in the steam pressure, the Pittsburgh Recording Gage is an ever present guardian against carelessness—its written record is truthful always.

This Gage may be placed near the Boiler, or any distance therefrom—in the office, for instance—where every fluctuation may be observed instantly. The Pittsburgh Recording Gage complies with every requirement of the Mining Laws, and can be easily attached to Mine Fans to record either pressure or vacuum, or both.

Made of the best quality of Brass, highly polished and heavily Nickel-plated.



FIG. 796

Shipped subject to trial, to be returned at our expense if not satisfactory in every way.

PRESSURE GAGES.

Chart No.	GRADUATIONS.	TOTAL SCALE	Chart No.	GRADUATIONS.	TOTAL SCALE
19	1-5 in. Head of Water	0 to 8 inches	74	5 lb. per sq. inch	0 to 150 lbs.
15	1 in. Head of Water	0 to 36 inches	75	10 lb. per sq. inch	0 to 180 lbs.
28	1 oz. per sq. inch	0 to 20 ounces	35	10 lb. per sq. inch	0 to 200 lbs.
29	1 oz. per sq. inch	0 to 36 ounces	30	10 lb. per sq. inch	0 to 350 lbs.
13	3/4 lb. per sq. inch	0 to 6 lbs.	39	25 lb. per sq. inch	0 to 500 lbs.
91	1/2 lb. per sq. inch	0 to 12 lbs.	64	50 lb. per sq. inch	0 to 1000 lbs.
94	1 lb. per sq. inch	0 to 25 lbs.	26	50 lb. per sq. inch	0 to 1500 lbs.
88	2 1/2 lb. per sq. inch	0 to 45 lbs.	203	100 lb. per sq. inch	0 to 4000 lbs.
81	2 lb. per sq. inch	0 to 90 lbs.			

VACUUM GAGES.

01	1-10 in. Head of Water	0 to 1 inch.	12	1/2 in. Head of Water	0 to 12 inches
02	1-10 in. Head of Water	0 to 2 inches.	93	1 in. Head of Mercury	0 to 30 inches
214	1-5 in. Head of Water	0 to 8 inches.			

COMBINATION VACUUM AND PRESSURE GAGES.

18	1-10 in. Head of Water	3 in. vacuum 4 in. pressure	54	{ Vac. in. Mercury and Pres. Lbs. per sq. in.	{ 30 in. vacuum 50 lbs. pressure
303	1-5 in. Head of Water	3 in. vacuum 4 in. pressure	5	{ Vac. in. Mercury and Pres. Lbs. per sq. in.	{ 30 in. vacuum 150 lbs. pressure
95	1/2 in. Head of Water	6 in. vacuum 6 in. pressure			

Charts 8 inches diameter. One complete revolution of chart every 24 hours.

LIST PRICE, including Lock and Key, Union Cock, Ink and 100 Charts, \$50.00 each.

BRISTOL'S RECORDING GAGES

FOR PRESSURE AND VACUUM

Original Form Model 10



FIG. 797

ORIGINAL FORM Model 10 Instrument, as illustrated, is designed to furnish continuous records of pressure or vacuum on round charts 12 inches or 8 inches in diameter. For all ranges from full vacuum to 12,000 pounds pressure. Charts can be furnished graduated to read in pounds, ounces, feet, inches, metric unit or any other unit desired. Also furnished to make one complete revolution in 7 days, 24 hours, 12 hours, etc.

Round Form Model 60



FIG. 798

ROUND FORM Model 60 with charts 10 inches or 8 inches can be furnished at a somewhat lower price than Model 10. The difference in design is the reason for this. This is, however, a reliable instrument, sensitive and accurate in operation and rugged in construction.

LIST PRICES

Size of Chart.....Inches	12	10	8
Original Form Model 10, Full Nickel Finish.....	\$60.00	.....	50.00
Original Form Model 10, Black Case, Nickel Door.....	55.00	.....	45.00
Portable Form Model 12, Light Wood, Carrying Case...	60.00	.....	50.00
Moisture Proof Model 40, Iron Case, Black Finish.....	60.00	.....	50.00
Water Proof Model 45, Iron Case, Black Finish.....	76.00	.....	65.00
Round Form Model 60, Full Nickel Finish.....	.....	50.00	40.00
Round Form Model 60, Black Case, Brass Door.....	.....	40.00	30.00

Prices include with each Instrument, 100 Charts, Bottle Special Recorder Ink, Pen Filler, Lock and Key, Clock Key, Union Connections, etc.

BRISTOL'S RECORDING THERMOMETERS

CLASS II FOR RANGES FROM 90 TO 500 DEGREES FAHR.

Model 210 with Plain Bulb



FIG. 799

The equipment consists of a Recording Instrument and Sensitive Bulb, which are connected by means of flexible connecting tube, thus making it possible to install the instrument at a convenient location a considerable distance from the temperatures to be recorded.

Space does not permit us to list all of the different types of bulbs. However, as a rule, Plain Bulbs are furnished with instruments used to record temperatures in open spaces, i. e., Dry Kiln, Heaters, Drying Ovens, etc. Where temperatures of air, gases, steam and liquids in closed spaces under pressure are to be recorded, screw bulbs with union connections are furnished for applications, such as Feed Water for Boilers, Steam for Heating Apparatus, etc.

Charts can be furnished graduated to suit all requirements within the limits of 90 to 500 degrees Fahrenheit. Sizes 12, 10, 8 and 6 inches in diameter.

When ordering Bristol's Class II Recording Thermometers be sure to advise the APPLICATION for which the instrument will be used. If possible also give the SIZE of CHART, MODEL NUMBER of instrument and MAXIMUM and MINIMUM TEMPERATURES which are to be recorded.

LIST PRICES

The following prices include Bristol's Class II Recording Thermometer with 25 feet of flexible connecting tube.

Form	Model	Size Chart	Plain Bulb No. 202		Screw Bulb No. 222	
			Full Nickel	Black Case Nickel Dr.	Full Nickel	Black Case Nickel Dr.
Original	210	12-inch	\$76.00	71.00	77.00	72.00
Original	210	8-inch	66.00	61.00	67.00	62.00
Round	260	10-inch	71.00	61.00	72.00	62.00
Round	260	8-inch	61.00	51.00	62.00	52.00
Eccentric	253	6-inch	46.00	41.00	47.00	42.00

Prices include with each Instrument, 100 Charts, Bottle of Special Recorder Ink, Pen Filler, Lock and Key.

BRISTOL'S RECORDING THERMOMETERS

CLASS III FOR RANGES FROM 60 BELOW ZERO TO
800 DEGREES FAHRENHEIT

Model 310 with Screw Bulb 322

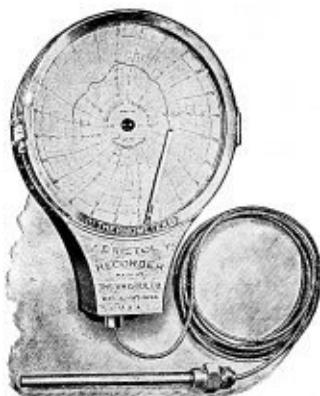


FIG. 300

The charts for Bristol's Class III Recording Thermometers have uniform scale graduations over the entire range, thus affording clear readings for all temperatures. These are adaptable for application for temperatures in Refrigerating Rooms and higher ranges, such as Superheated Steam and Flue Gas temperatures.

A variety of bulbs are available for many different applications. Plain or screw bulbs of various sizes and lengths can be furnished lead covered for protection where used in connection with acids which cause corrosion of the metal, or with separable sockets to protect against undue pressures. The following lists cover only two of the most widely used, Bulb No. 322, with union connection and 1 inch pipe threads, used for temperatures of liquids in closed spaces under pressure, and Bulb No. 372, with dart union and iron pipe protection for taking flue gas temperatures or similar purposes.

LIST PRICES

The following prices include Bristol's Class III Recording Thermometer with 25 feet of flexible connecting tube. For extra lengths of connecting tube add 40c per foot extra list.

Form	Model	Size Chart	Bulb No. 322		Bulb No. 372	
			Full Nickel	Black Case Nickel Dr.	Full Nickel	Black Case Nickel Dr.
Original	310	12-inch	\$85.00	80.00	82.00	77.00
Original	310	8-inch	75.00	70.00	72.00	67.00
Round	360	10-inch	80.00	70.00	77.00	67.00
Round	360	8-inch	70.00	60.00	67.00	57.00
Eccentric	353	6-inch	55.00	50.00	52.00	47.00

Prices include with each instrument, 100 Charts, Bottle of Special Recorder Ink, Pen Filler, Lock and Key.

STANDARD MECHANICAL THERMOMETERS

"LAMINA ACTUATED," EVERY PART METAL, NO GLASS TO BREAK

The only practical thermometer for use in sugar boilers, vulcanizers, Japan ovens, boilers, hot water and steam lines, ovens, dry kilns, water and oil tanks, retorts, vacuum pans. Furnished in Reaumur or Centigrade scale.

Horizontal Extension Type.

Has enamel dial, heavy spun brass case and extension standard pipe thread.

These thermometers have been on the market for thirty years. They are the most efficient for all mechanical uses.

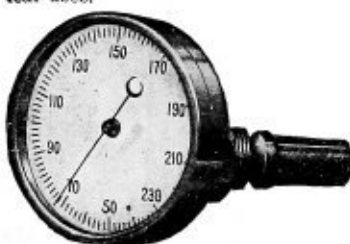


FIG. 801

In all thermometers for mechanical uses the length of extension is measured from the end of the screw thread to the end of the lamina cover, and is the portion of the thermometer extending into the receptacle.

No.	Diam. of Dial, Inches	Pipe Thread, Inches	Length of Extension, Inches	Range in Degrees Fahrenheit	Price F. O. B. Boston
10	6	1	6	0 to 400	\$16.00
12	6	1	6	50 to 250	15.00
13	6	1	6	-50 to 150	15.00
20	6	$\frac{3}{4}$	6	0 to 400	11.00
21	6	$\frac{3}{4}$	6	50 to 250	10.00
22	6	$\frac{3}{4}$	6	-50 to 150	10.00
30	4	$\frac{3}{4}$	6	0 to 400	11.00
31	4	$\frac{3}{4}$	6	50 to 250	10.00
32	4	$\frac{3}{4}$	6	-50 to 150	10.00
42	4	$\frac{3}{4}$	12	50 to 250	6.00
42-1	4	$\frac{3}{4}$	12	100 to 300	6.00
42-2	4	$\frac{3}{4}$	12	0 to 400	7.00
42-3	4	$\frac{3}{4}$	12	-50 to 150	6.00
42-4	4	$\frac{3}{4}$	2	0 to 200	6.00
42-B	3	$\frac{3}{4}$	2	50 to 250	6.00
44	4	$\frac{3}{4}$	4 1/2	50 to 250	8.00
44-1	4	$\frac{3}{4}$	4 1/2	100 to 300	8.00
44-2	4	$\frac{3}{4}$	4 1/2	0 to 400	9.00
44-3	4	$\frac{3}{4}$	4 1/2	-50 to 150	8.00
44-4	4	$\frac{3}{4}$	4 1/2	0 to 200	8.00

Vertical Type

Enamel dial, all parts brass, standard pipe thread. Permanently accurate.



FIG. 802

No.	Diameter of Dial, Inches	Pipe Thread, Inches	Length of Extension, Inches	Range in Degrees Fahrenheit	Price F. O. B. Boston
5	6	1	6	100 to 300	\$16.00
7	6	1	6	50 to 250	16.00
8	6	1	6	-50 to 150	16.00
15	6	$\frac{3}{4}$	6	100 to 300	15.00
16	6	$\frac{3}{4}$	6	50 to 250	15.00
17	6	$\frac{3}{4}$	6	-50 to 150	15.00
18	6	$\frac{3}{4}$	6	100 to 500	15.00
25	4	$\frac{3}{4}$	6	0 to 400	11.00
25-1	4	$\frac{3}{4}$	6	100 to 300	11.00
26	4	$\frac{3}{4}$	6	50 to 250	11.00
26-1	4	$\frac{3}{4}$	6	0 to 200	11.00
27	4	$\frac{3}{4}$	6	-50 to 150	11.00
43	4	$\frac{3}{4}$	2	50 to 250	6.00
43-1	4	$\frac{3}{4}$	2	100 to 300	6.00
43-2	4	$\frac{3}{4}$	2	0 to 400	7.00
43-3	4	$\frac{3}{4}$	2	-50 to 150	6.00
43-4	4	$\frac{3}{4}$	2	0 to 200	6.00
45	4	$\frac{3}{4}$	4 1/2	50 to 250	9.00
45-1	4	$\frac{3}{4}$	4 1/2	100 to 300	9.00
45-2	4	$\frac{3}{4}$	4 1/2	0 to 400	9.00
45-3	4	$\frac{3}{4}$	4 1/2	-50 to 150	9.00
45-4	4	$\frac{3}{4}$	4 1/2	0 to 200	9.00

NOTE—The extensions on Nos. 15, 16, 17 and 18 are made of either brass, steel or copper, to suit conditions.

BROWN EXPANSION PYROMETERS
FOR BOILER FLUES, SUPER-HEATED STEAM, CHIMNEYS, ETC.

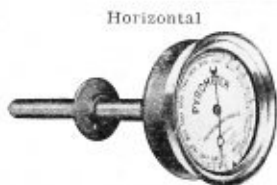


FIG. 803



FIG. 804

The above instruments CORRECTLY INDICATE temperatures up to 1200 degrees F. by the expansion of the metallic stem. In inquiries or orders, state necessary particulars as to use.

Price.....each \$18.75

BROWN THERMO ELECTRIC PYROMETER

Thermo-Electric
Pyrometer



FIG. 805

Recording
Thermometer



FIG. 806

Used for temperatures up to 3000 degrees F. Operate on the thermo electric principle. No outside current required. Successfully used for flue gas temperatures.

Price.....each \$75.00

Thermo couple and wiring extra.

BROWN RECORDING THERMOMETER

Indicate and record separator temperatures, condensor feed water temperature, etc. Extensively used in all large power plants. Sturdy in construction. Accurate.

Price.....each \$50.00

Twenty-five feet of armored tubing included.

THERMOMETERS FOR HOT WATER AND STEAM HEATING SYSTEMS

Straight

Angle



FIG. 807



FIG. 808

- Straight, for steam, with pressure scale.....each, \$3.00
 Straight, for hot watereach, 3.00
 Angle, for steam, with pressure scale.....each, 3.50
 Angle, for hot watereach, 3.50

No. 223 No. 224



FIG. 809 FIG. 810

THERMOMETERS

FOR ICE MACHINES, BRINE PUMPS AND TANKS

No. 223—Brass frame, cylinder Thermometer, $\frac{3}{4}$ inch screw thread, 20° below to 100° Fahrenheit.

List priceeach \$9.00

Angle Form Thermometers. Same as No. 223.

List priceeach \$11.50

No. 224—Brass frame, cylindrical Thermometer, $\frac{3}{4}$ inch screw thread, 20° below to 100° Fahrenheit. For brine tanks.

	12 in. stem	24 in. stem	36 in. stem
List .....each	\$12.00	\$14.00	\$16.00

THE "PITTSBURGH" PRESSURE GAGES FOR NATURAL GAS



FIG. 811

OPEN MERCURY GAGE.

FIG. 811

For 3 lb. Pressure	Each, \$5.00
" 5 lb. "	" 5.00
" 7 lb. "	" 6.00
" 10 lb. "	" 8.00
" 15 lb. "	" 12.00
" 20 lb. "	" 16.00
" 25 lb. "	" 20.00

This Gage consists of an iron body with a reservoir for mercury, into which extends a glass tube placed on a scale. The pressure enters through an iron nipple and forces the mercury into the tube, as shown in cut.

The figures on scale indicate pounds per square inch.

THE "PITTSBURGH" SYPHON PRESSURE GAGE

FIG. 812

4 inch Nickelod	Each, \$5.00	14 inch Nickelod	Each, \$15.00
6 " "	" 6.50	16 " "	" 18.00
8 " "	" 8.00	18 " "	" 22.00
10 " "	" 10.00	20 " "	" 28.00
12 " "	" 12.00	24 " "	" 35.00

This Gage has a "U"-shaped glass tube with a movable scale. The scale is divided into inches and sub-divided into tenths of inches. Can be used either with water or mercury filling. If used with mercury two inches of mercury will be equal to one pound. One end of the tube is open to the atmosphere; the other end is provided with a brass tube for connecting to the pressure pipe.



FIG. 812

THE "PITTSBURGH" MINERS' WATER GAGES

FOR MEASURING THE PRESSURE OF AIR IN MINES
IN CONNECTION WITH THE VENTILATING
APPARATUS

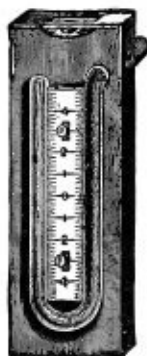


FIG. 813

\$13. Plain Water Gage, with 5-inch movable brass scale and level at top	each	\$3.75
\$13½. Plain Water Gage with 5-inch scale, with rack and pinion movement and level	each	\$4.25

EIGHT DAY MARINE AND LOCOMOTIVE CLOCKS



FIG. 814



FIG. 815

For Ships, Steamers, Yachts, Locomotives, Engine Rooms or other places where Pendulum Clocks cannot be used on account of vibration.

Movements finely finished throughout with jeweled escapement and chronometer balance.

They may be adjusted upon order, and will then fulfill all requirements of a chronometer.

Fig. 814 and Fig. 815 are made with dials $4\frac{1}{2}$, 6, 8, 10 and 12 inches in diameter. The $4\frac{1}{2}$ inch, 6 inch and 8 inch have porcelain enameled dials. The 10 inch and 12 inch have silvered or white enameled metal dials.

The Fig. 814 cases are made of heavy metal finished in polished brass, copper or nickel; the Fig. 815 cases are made of wood to match other furniture.

FIG. 814

Size Dial.....inch	$4\frac{1}{2}$	6	8	10	12
Price.....each	\$40.00	45.00	70.00	85.00	95.00

FIG. 815

12 inch Dial.....each	\$40.00
14 " " Electric Secondary Clock....."	45.00

OFFICE AND MILL CLOCKS



FIG. 816

12-INCH HERON OAK OR MAHOGANY
FINISH

8-day Time	each \$ 9.50
8-day, Half Hour Strike.....	each 10.95
8-day Time Calendar.....	each 10.22
8-day Half Hour Strike, Calendar.....	each 11.67
12-inch dial, Height 32 inches.	

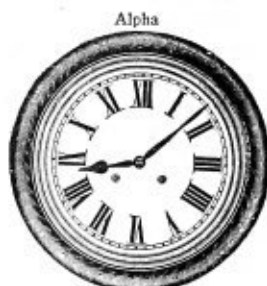


FIG. 817



FIG. 818

ALPHA

Oak or Walnut. 12-inch Dial. Diameter, 16 $\frac{3}{4}$ inches

8-day, Time (Pendulum Movement).....	each \$ 8.90
8-day, Half-hour Strike (Pendulum Movement).....	10.35

OAK LEVER

1-day 4-inch Time, width 7 inches.....	each \$ 4.00
1-day 6-inch Time, width 9 inches.....	each 4.75
1-day 6-inch Strike, width 9 inches.....	each 7.85
8-day 6-inch Time, width 9 inches.....	each 6.75
8-day 8-inch Time, width 10 $\frac{1}{4}$ inches.....	each 7.95
8-day 8-inch Strike, width 10 $\frac{1}{4}$ inches.....	each 9.90
8-day 12-inch Time, width 15 inches.....	each 9.90
8-day 12-inch Strike, width 15 inches.....	each 11.90

BRASS CASE BAROMETERS

WITH REVOLVING BACK

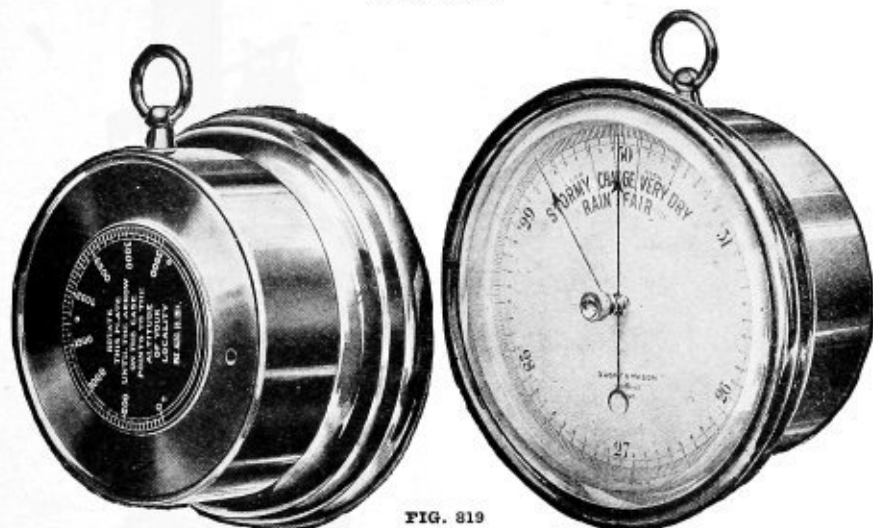
ADJUSTABLE FOR ANY ALTITUDE UP TO AND INCLUDING
3,500 FEET

FIG. 819

No. 2252

Weight 25 ozs.

An adjustment whereby the barometer hand points directly to the approximate weather mark, and at a glance the weather to be is foretold.

From a manufacturing standpoint it is necessary to arrange the "weather words" on an Aneroid Barometer in relation to the barometric pressure scale at sea level, in order to fix a standard level for observation.

Since barometric reading is affected by altitude, and it is obviously impossible because of the enormous variety involved, to make special instruments for various altitudes, from sea level upwards, the desirable barometer is one provided with a means of adjustment whereby the observer may take observations, agreeing with sea level readings, at any desired location.

The instrument illustrated and described is arranged in such a manner that it is suitable for use in any location from sea level to 3,500 feet elevation. The adjustment is very simple and no derangement of the working parts is necessary. Once adjusted for a given location by the observer no further adjustment is required.

Turn the Brass Plate set in the back of the case (this is easily done with the fingers) until the number of feet corresponding to the elevation of the city or town is opposite the arrow. The hand will then point to the proper weather mark and the reading will be the same as that of the U. S. Weather Bureau, which is sea level reading.

- | | | |
|-----------|--|--------------|
| No. 2252. | 5-inch Brass Case Barometer, enamel metal dial, good grade movement, in card case..... | each \$10.00 |
| No. 2253. | 5-inch Brass Case Barometer, metal silvered dial, first quality, compensated movement, in card case..... | each 15.00 |

AMERICAN THOMPSON IMPROVED INDICATORS

Regular Inside Spring Indicator. Two-inch paper drum and new improved detent motion.

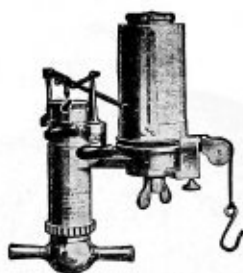


FIG. 820

Regular Inside Spring Indicator with 2-inch paper drum.

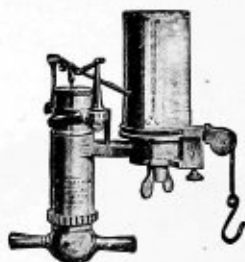


FIG. 821

Exposed Spring Indicator with 2-inch paper drum and new improved detent motion.

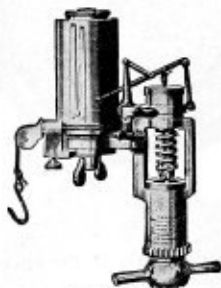


FIG. 822

Regular Inside Spring Indicator. Two-inch paper drum, new improved detent motion and the American Ideal reducing wheel.

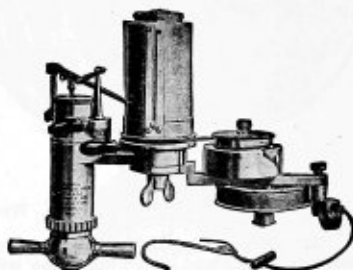


FIG. 823

Any of the above styles can be furnished with 1½-inch paper drum for high speed work if so ordered.

The Indicators shown on this page call for particular consideration on account of the prominence they have attained in engineering circles during the thirty odd years they have been on the market. Their record as instruments of precision and durability cannot be equalled.

PRICE LIST

American Thompson Improved Indicator.....	each, \$60.50
Ammonia Indicators	each, 82.50
Indicators with electrical attachment	each, 88.50
Detent motion, extra, net	each, 16.50
Reducing wheels, extra	each, 12.50

Same prices apply on 2-inch or 1½-inch drum—inside or exposed spring.

Each indicator is packed in a handsome mahogany case; the prices given above include indicator with two cylinder springs, two single cocks, one scale, wrenches, screw driver, bottle of oil and book entitled "Twenty Years with the Indicator," by T. Pray, Jr.

Three-way cock will be furnished if desired, instead of two straight cocks, but mahogany case will not be furnished to hold it.

AMERICAN INDICATOR COCKS

Made of the very best steam metal with clear, unobstructed steam passage to the Indicator.

For Ammonia Indicators these cocks are made of steel.

AMERICAN STRAIGHTWAY

One end is threaded one-half-inch pipe thread. Other end has Indicator connection.

PRICES

For Steam Indicator..... \$2.50
For Ammonia Indicator..... 6.00

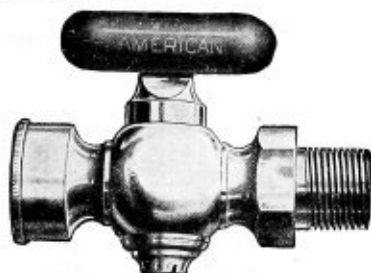


FIG. 824

AMERICAN THREE-WAY

Made in two sizes. No. 2 is larger and has slip joint. No. 3 small size without slip joint.

All are tapped one-half-inch pipe thread on each end with Indicator connection on top.

No. 2

For Steam Indicator..... \$ 5.25
For Ammonia Indicator..... 13.50

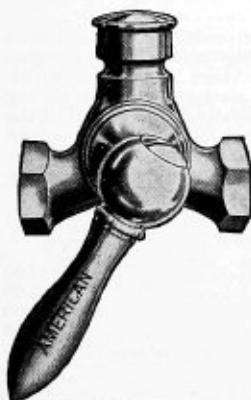


FIG. 826

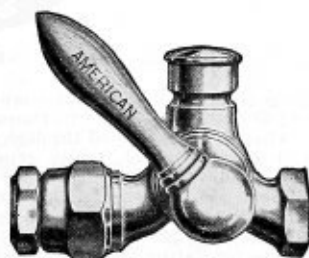


FIG. 825

No. 3

Price \$4.25

All American Indicator Cocks are made to fit other makes of indicators when so ordered.

REVOLUTION COUNTERS OR ENGINE REGISTERS



FIG. 827

PRICES, SQUARE CASE, BRASS

4 Figures, Size 7	$x 2\frac{1}{2}$ inches	each	\$20.00
5 " " " 8	$x 2\frac{1}{2}$ " "	"	24.00
6 " " " 9	$x 2\frac{1}{2}$ " "	"	28.00
7 " " " 10	$x 2\frac{1}{2}$ " "	"	32.00
4 " " " 4 $\frac{1}{2}$	$x 1\frac{3}{4}$ " "	"	17.50
5 " " " 5	$x 1\frac{3}{4}$ " "	"	20.00
6 " " " 5 $\frac{1}{2}$	$x 1\frac{3}{4}$ " "	"	24.00
7 " " " 6	$x 1\frac{3}{4}$ " "	"	28.00

With resetting attachment, \$4.00 each extra; nickel plating extra.

ROUND REVOLUTION COUNTER



FIG. 828

The construction of the counter is such that either a reciprocating or continuous movement of the crank-shaft will transmit a positive rotating motion to the decimal wheels. This is accomplished through the medium of the verge movement, which consists of a verge wheel rigidly attached to the initial decimal wheel; a sliding plate placed transversely to such verge wheel. The reciprocating movement of the sliding-plate is controlled by a cam on the crank shaft; such cam operating within a square hole in the sliding-plate; the cam is so formed that it is always in engagement with the sides of such hole; and the constant change of motion of the sliding-plate in its reciprocating action will be accomplished without jar or wear.

PRICES, ROUND CASE, BRASS

12 inch Dial, 8 Wheels	each	\$110.00
10 " " " 8	"	95.00
8 $\frac{1}{2}$ " " " 8	"	80.00
12 " " " 6	"	100.00
10 " " " 6	"	85.00
8 $\frac{1}{2}$ " " " 6	"	70.00
6 $\frac{3}{4}$ " " " 6	"	60.00
6 " " " 6	"	50.00

REVOLUTION COUNTERS

Model A



FIG. 829

Model A with Guard and Lock



FIG. 830

A strong, durable ratchet counter, easily reset, adapted to stamping presses, conveyors and other severe usage; also supplied with alarm bell for special applications.

Style	No. of Figures	Counting up to	Size Inches	Weight Pounds	PRICE EACH	
					Plain	With Guard and Lock
4A-1	4	9999	7x2¼x1¾	3	\$ 8.50	\$10.50
5A-1	5	99999	8½x2¼x1¾	3¼	10.00	12.00
6A-1	6	999999	10x2½x1¾	4	12.00	14.00

Model B



FIG. 831

MODEL B

Model C



FIG. 832

A compact, full geared, dependable counter with outside reset. Brackets are arranged for securing to horizontal or vertical surfaces. Lever can be set at any position.

Style	Five-fig.	Six-fig.
Price, Case 3½ inches long; Weight, 2¼ pounds.....each	\$10.00	\$12.00
" with Lock	10.50	12.50
" Rotary Drive	10.00	12.00
" Lineal Measure Attachment.....	20.00	....

MODEL C

For use on scales, engines, pumps, etc. Rust-proof case, 5x3 inches.
Price, Six-figure, Non-resetting.....each \$16.00



FIG. 833

MODEL D

With outside reset, two-thirds size of Model B. A lighter built, compact counter for small machines and office appliances.

Price, Four-figure.....each \$8.00
Price, Five-figure.....each 9.00

HAND TALLY

A strong, accurate and dependable device for pole counting and for recording attendance in public places.

No.	Style	Size Inches	Weight Ounces	Price Each
0	Three-dial	2¼	6	\$3.00
1	Four-dial	2¼	6	4.00

VEEDER REVOLUTION COUNTERS

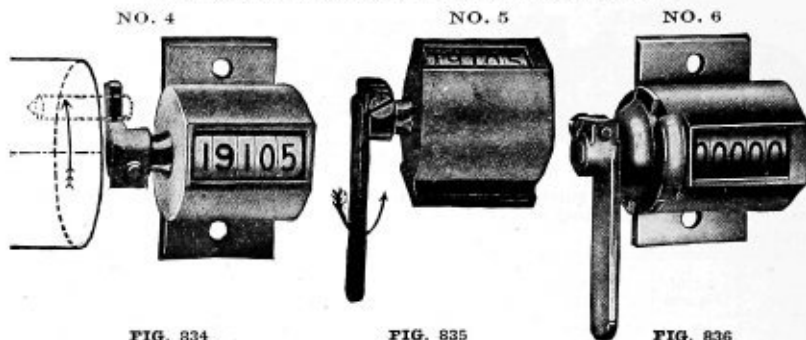


FIG. 834

FIG. 835

FIG. 836

No. 4 Counter requires a complete revolution of the shaft for each registration. It is regularly furnished with a flange base, though the gib base as shown in No. 5 can be had if preferred. This counter has undoubtedly the most reliable form of driving mechanism of any of our various styles. Its action is most smooth and uniform and it will stand a very high rate of speed. If run backwards, it subtracts

Priceeach \$1.25

No. 5 Rotary Ratchet Counter. Same as No. 6 described below, except has a gib instead of flange base.

Priceeach \$1.50

No. 6 Rotary Ratchet Counter. Flange base; a complete revolution of lever registers ten.

Priceeach \$1.50

NO. 7 STAR REVOLUTION COUNTER



FIG. 837

This instrument registers one figure when the star wheel is moved a distance of one point, or one-fifth of a revolution. It is operated by a pin or roller on a revolving part of the machine to which it is attached. It will then register the number of revolutions. When run backward it registers backwards. It is especially adapted for hand operated mechanisms such as neostyles, nickel-in-slot machines, etc., where the speed is not great nor the motion continuous.

Priceeach \$1.50

CLUTCH SPEED COUNTER NO. 21

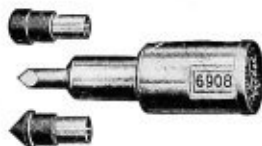


FIG. 838

This is without a question the best instrument manufactured for finding revolutions per minute made by a shaft, or any other revolving part.

A stop watch is not needed because of the clutch in the counter. The plain figure index is easy to read and avoids errors. It is never necessary to set the instrument. Speeds as high as 5,000 R. P. M. can be safely measured. Two rubber tips, one pointed and the other flat, are furnished with each instrument.

Priceeach \$3.00

Extra rubber tipseach .25

VEEDER REVOLUTION COUNTERS

No. 11



FIG. 839

No. 12 Star

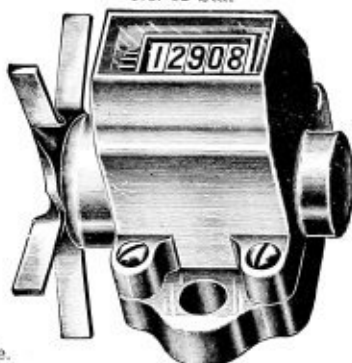


FIG. 840

Cuts full size.

- No. 11—Revolution Counter; has large protecting case and is suitable where a light counter would fail.....Price each \$7.00
 No. 12—Star Counter; same as No. 11 except has star wheel in place of gearPrice each 7.00

No. 14

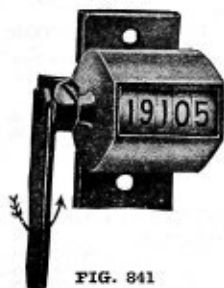


FIG. 841

NO. 14 RATCHET COUNTER

The No. 14 Ratchet Counter is supplied with outside stops which regulate the throw of the lever.
 Price each\$1.50

VEEDER SMALL SET BACK COUNTERS

No. 23



FIG. 842

Five Wheels
No. 218T

FIG. 843

No. AA3



FIG. 844

- No. 23—With drive on right.....Price each \$5.00
 No. 218T—With thumb lever on left.....Price each 5.00
 No. AA3—With drive on right.....Price each 5.00
 When ordering, state if it is desired to have the drive shaft project on the right or left hand side; also give number of figure wheels required.

STARRETT'S SPEED INDICATORS

No. 104



FIG. 845

No. 104 HIGH SPEED INDICATOR

This indicator may be run at highest speed required without heating, and this on account of our frictionless bearing against which the inner end of the spindle revolves (a feature patented by us). The working parts of this instrument are encased, and the dial plate has two rows of figures, reading right or left, as the shaft may run.

NICKEL PLATED

In Pasteboard Box.....	\$1 00
In Leatherette Case.....	1 50

We supply the indicators with a spindle $7\frac{1}{2}$ inches long for use on Dairy Machines, etc., for 50 cents extra.

The indicator in pasteboard box (list \$1.00) will be sent unless otherwise ordered.

No. 106



FIG. 846

No. 106 IMPROVED SPEED INDICATOR

The graduations show *every* revolution, and with two rows of figures read both *right* and *left*, as the shaft may run. The instrument is nickel-plated, and has a rosewood handle.

In Pasteboard Box.....	\$1 50
In Leatherette Case.....	2 00

Sent in pasteboard box unless otherwise ordered.

No. 107



FIG. 847

No. 107 REGISTERING SPEED INDICATOR

This instrument was devised to automatically register hundreds as well as units and tens, and thus relieve the mind from keeping tally. Will register 5,000 revolutions.

In Pasteboard Box.....	\$3 00
In Leatherette Case.....	3 50

Sent in pasteboard box unless otherwise ordered.



Showing Attachment Applied to Indicator.

No. 109

No. 109 SURFACE SPEED ATTACHMENT
FOR SPEED INDICATORS

This attachment applied to one of our speed indicators is designed to show the number of lineal feet per minute the periphery of a shaft or pulley is running and thus enable a workman to know if the speed is too fast, or is too slow to get the most work the tool will stand. For instance, the speed of a cone pulley being turned needs to be changed at every step. The rubber-banded indicator wheel may be instantly slipped off or on the spindle of any of our speed indicators, and when held against the periphery of a shaft or pulley a half minute or a minute, by dividing the figures showing the revolutions on the dial of the indicator by 2, the number of feet the surface of the thing is traveling is obtained, as each revolution of the indicator wheel shows six inches: twice around, one foot.

Price, Each.....	\$0 50
------------------	--------



FIG. 848

RUBBER TIPS

FOR POINTED AND HOLLOW CENTERS

An important improvement which we may now apply to all of our Speed Indicators, without extra charge, consists in adding to the hardened steel pointed spindle, rubber tips for both pointed and centered shafts, which not only remove the jar and run smoothly, but produce a stronger frictional contact between the shaft and the instrument.

THE "CHICAGO" APPROVED PORTABLE WATCHMAN'S CLOCK



FIG. 849

Bears the inspection label of the Underwriters' Laboratories, the certificate of its approval by the National Board of Underwriters.



The "Chicago" watch-clock appeals to users who buy on quality and for long service. It embodies in the highest degree simplicity, effectiveness, durability and economy of maintenance in combination with a method of registration which has secured for it the endorsement of engineers, specialists and users, as a conspicuous improvement in this line. The record or registration on the dial is obtained by forcing a male die or marker into a matrix or female die. The dial record sheet which lies between the marker and the matrix receives a clearly embossed figure or record. The male die or marker is not on, and a part of, the key, but is a part of the mechanism contained within the clock case where it is secure against abrasion or injury in any form, with the result that the embossed record will be as clear-cut and positive after ten or twenty years of service as it is on the first day of use.

The case of the clock is made of aluminum, exceptionally strong, light and always clean. The keys are of Delta Metal, rust-proof and non-corrosive and they are attached to the stations by a type of chain which is tamper-proof and practically indestructible. The clock is especially desirable for use in factories, saw-mills, oil mills, compresses, warehouses or in any premises where hard service may be expected, and for out-of-door patrol.

This clock is sold with any number of stations from six up and on the following price basis:

6 station outfit complete with lock box stations.....	\$65.00
Additional stations, each.....	1.75
Future dial supplies, per box of 375.....	1.75

HARDINGE "ALERT" WATCHMAN'S PORTABLE CLOCKS

APPROVED AND LABELED BY NATIONAL BOARD OF FIRE
UNDERWRITERS. APPROVED BY ALL MUTUALS

No. 12
Alert Clock

Model "A"
Lock-Box Station

Model "B"
Drop-Cover Station

Model "C"
Lock-Box Station



FIG. 850



FIG. 851



FIG. 852



FIG. 853

The Hardinge Alert Watchman's Clock System consists of a Hardinge Alert Portable Clock (No. 12) and a series of Stations (Models "A," "B" or "C"). The installation is very simple, consisting merely of fastening the stations in their proper positions with screws and metal seals.

On his round the watchman takes the key in the station box (Models "A," "B" or "C"), inserts it into the key-hole of the clock, turns the cam about one-half turn to the right until it clicks. The Patent Alarm within the clock clicks to tell the watchman that the operation is complete.

The "Alert" clock has the same Spring-Driven Dial Carrier; the same Patent Detective Lock; the same Aluminum Case; the same High-Grade Interchangeable Movement as the "Patrol," described on the opposite page. It may also be supplied with the same special movement, and paper dials for day and night use without changing dials.

The life of the embossing key is TRIPLED in the Hardinge Alert System because, unlike all others of its type, the KEY is NOT TURNED when making the record. The key is inserted into the clock through a keyhole having TEN TIMES the WEARING SURFACE OF ANY OTHER MAKE, and then the cam raises it vertically so that the embossing character on the key fits squarely into the matrix within the clock.

It is the turning of the key in all systems using a flat, one-piece key which wears the embossing characters, as well as the matrix, resulting in a very short time in an illegible record. This one feature alone of the Hardinge Alert System greatly prolongs its usefulness and makes it more valuable and less expensive eventually, than any other system of its type on the market.

The ultimate capacity of the "Alert" clock is 32 stations. The system may start with one station if desirable and additions up to 32 may be made at any time, with no interruption or re-arrangement of the system.

The price of an Alert Watchman's Portable Clock System is governed by the Model of the Station desired (see Models "A," "B" and "C"). The clock furnished with either Model "A," Model "B" or Model "C" Station is identically the same and in each instance the price includes the Leather Pouch with extra heavy wire Grille to protect the crystal, and one year's supply of Paper Dials. Alert Clock (No. 12) including Leather Pouch with wire grille and one year's

supply of dials.....\$45.00

Stations for same:

Model "A," complete.....each \$2.50

Model "B," complete.....each 1.50

Model "C," complete.....each 2.00

THE HARDINGE WATCHMAN'S REGISTER
APPROVED AND LABELED BY NATIONAL BOARD OF FIRE UNDER-
WRITERS. APPROVED BY ALL MUTUALS

No. 2 Patrol Clock



FIG. 854

No. 3 Patrol Station



FIG. 855

The Hardinge Watchman's Register consists of the Hardinge "Patrol" Watchman's Portable Clock (No. 2) and a series of Recording Stations (No. 3). The installation is very simple, consisting merely of fastening the Recording Stations in their respective positions with screws and metal seals.

In making the Record, the watchman places his clock against the recorder in the recording station, the paper dial inside the clock fits between the jaws of the recorder and the pressure of the clock against the recorder operates the recording device, making a clean, legible record. This system is a favorite with watchmen because of simplicity of operation.

The clock movement has an 11-jewel escapement, which insures correct time keeping. The design and workmanship are in accordance with the most stringent requirements for accuracy and long life. The movement is interchangeable, a most important feature for maintaining continuous service.

For plants where day- as well as nightwatch service is required, we furnish a special clock with TWENTY-FOUR HOUR PAPER DIALS, WITHOUT EXTRA CHARGE. The twenty-four hour paper dial will take care of a day and night record for forty-eight hours.

The movement has a Spring-Driven Dial Carrier, making it impossible for the Watchman to successfully hold the paper Dial in order to make a false record.

The Case is of aluminum, making it light and durable, also preventing tarnish or injury from grease and acids.

The Case is provided with a PATENT DETECTIVE LOCK which makes it impossible to lock or unlock the clock without detection.

The Recording Station (No. 3) consists of a strong metal LOCK-BOX, SEALED into position with PATENT METAL SEALS, which are far superior to the paper seals used in other systems.

The Recording Station contains a PATENT ALARM to inform the watchman when a perfect record has been made.

The flexibility and adaptability of the Hardinge Watchman's Register make it more desirable than any other system on the market. The same clock may be used whether the system embraces ONE or ONE HUNDRED stations. There is no difference in the size or model of the clock or in the size of the recorder.

ANY NUMBER OF CLOCKS MAY BE USED ON THE SAME SET OF STATIONS, making it the only system on THE MARKET that is wholly satisfactory to large and small plants. The CAPACITY of the clock is UNLIMITED. The system may start with one station and may be added to at any time WITHOUT LIMIT, with no interruption of the SERVICE.

The prices on the various parts of the Hardinge Watchman's Register are as follows:

Patrol Clock (No. 2), including Leather Pouch with wire Grille and one year's supply of dials.....	\$45.00
Recording Stations (No. 3), complete with Screws and Seals, each.....	3.50
Recording Stations for points where they must be flush with walls, made of bronze and finished, if desired, to match hardware or woodwork.....	
Prices on application.	

BRASS STEAM WHISTLES FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

No. 600
With Lever Valve

FIG. 856

No. 602
Without Valve

FIG. 857

Diameter of Bell.....inches	1	1 1/4	1 1/2	2	2 1/2
Length of Bell.....inches	2 1/2	3	3 1/4	4	4 1/2
Size of Pipe.....inches	1/4	1/4	3/8	1/2	3/4
No. 600 .....each	\$3.10	3.75	4.00	5.70	6.50
No. 602 .....each	2.20	2.75	3.00	4.35	5.25

Diameter of Bell.....inches	3	3 1/2	4	5	6
Length of Bell.....inches	5	5 3/4	6 1/2	8	9 1/2
Size of Pipe.....inches	3/4	1	1 1/4	1 1/2	2
No. 600 .....each	\$8.50	11.50	15.00	22.50	33.00
No. 602 .....each	7.25	9.50	12.00	19.00	24.00

Diameter of Bell.....inches	8	10	12
Length of Bell.....inches	14	16	22
Size of Pipe.....inches	2 1/2	3	3
No. 600 .....each	\$95.00	225.00	425.00
No. 602 .....each	70.00	175.00	350.00

Brass Whistles with longer bell than standard, made to order at an extra price.

Always order Whistles by the diameter of bell and not by the size of pipe. Whistles for higher pressures made to order at an extra price.

No. 608



FIG. 858

WHISTLE VALVES

Size .....inches	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Price .....each	\$2.00	2.50	3.00	3.50	5.00	6.00	9.00	18.00	27.00

MOCKING BIRD STEAM OR AIR WHISTLES FOR STEAM OR AIR WORKING PRESSURES UP TO 120 POUNDS

Diameter of Bell.....inches	3	4	5	6
Length of Bell.....inches	9	12	15	18
Size of Pipe.....inches	1	1 1/4	1 1/2	2
No. 604.....each	\$40.00	53.00	70.00	95.00

This improved piston Whistle is particularly adapted for river boats, fog signals, fire alarms, etc., making a different sound from the ordinary steam whistle, being so constructed that the sound can be changed instantly, whereby boats, etc., using them, can be easily distinguished at a long distance.

Always order Whistles by the diameter of the bell, and not by the size of the pipe.

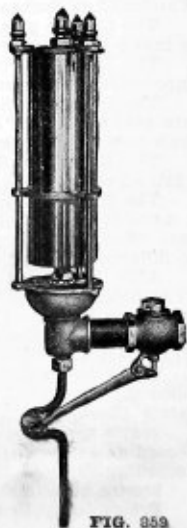


FIG. 859

SINGLE BELL CHIME WHISTLES FOR COMPRESSED AIR

SUITABLE FOR WORKING PRESSURES FROM 25 TO 150 POUNDS

No. 607
With Lever Valve

No. 607½
Without Valve

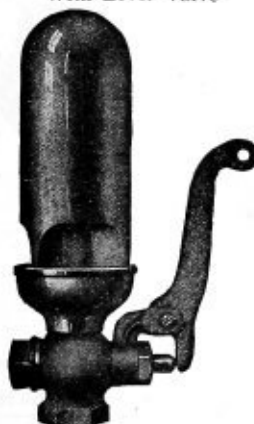


FIG. 860

Diam. of Bell, In.	Size of Pipe, In.	No. 607 With Lever Valve, Each	No. 607½ Without Valve, Each
1½	¾	\$6.00	\$4.50
2	1½	7.00	5.00
2½	¾	9.00	7.00
3	¾	11.00	8.00
3½	1	15.00	11.00
4	1¼	18.00	14.00
5	1½	28.00	22.00
6	1½	42.00	38.00
8	2	100.00	85.00

Chime Whistles can only be furnished with Pipe Connection as listed above.

Always order Whistles by the diameter of Bell, and not by the size of Pipe Connection.

Special Whistles made to order for Air Pressures below 25 pounds. Prices on application.



FIG. 861

CHIME STEAM WHISTLES BRASS, WITH IRON PIPE AND FITTINGS

Any number or size of bells made to order.
Prices on application.

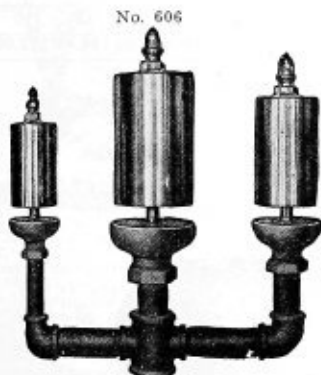


FIG. 862

GONG WHISTLES

It is made all of iron and will last forever. It makes an entirely different sound from an ordinary whistle. It can be heard distinctly from six to eight miles.

Diameter of Gong, Inches	Price	Size of Steam Inlet, Inches
3	\$10.00	¾
4	12.00	1¼
6	16.00	1½
8	20.00	2
10	30.00	2½

Prices do not include whistle valves.



FIG. 863

TRIP GONG BELLS

WILL NOT CRACK. TONE EQUAL TO BELL METAL.
ALL ABOVE 8 INCHES HAVE WOOD HAMMERS.

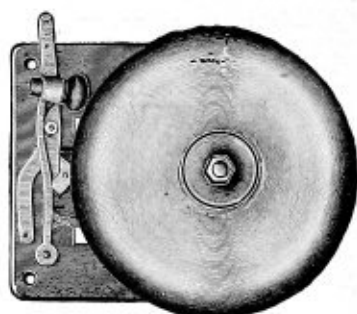


FIG. 864

GONGS FORMED FROM WROUGHT BRASS

Size	inches	3	4	5	6	7	8	10	12
Price	per dozen	\$10.00	12.50	16.50	24.00	34.00	46.00	84.00	150.00

GONGS FORMED FROM WROUGHT STEEL

Size	inches	3	4	5	6	7	8	10	12	14	16
Price	per dozen	\$9.50	10.80	12.00	18.00	24.00	36.00	60.00	96.00	144.00	192.00

FOOT GONGS

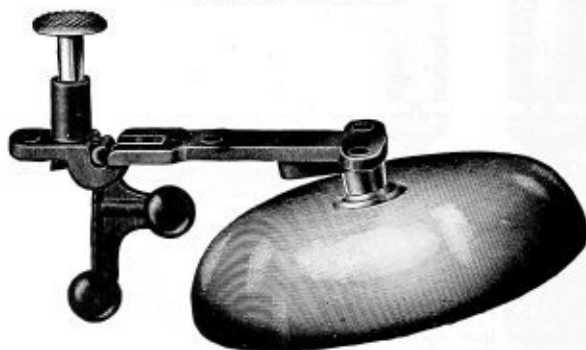


FIG. 865

FOR CARS, AMBULANCES, PATROL WAGONS, ETC.
BLACK OR NICKEL BELLS, ENAMELED FITTINGS.

No.	160	161	162	163	164	165
Size .....inches	8	9	10	11	12	14
Price .....each	\$1.60	1.86	2.16	2.36	2.60	3.00

CRYSTAL METAL FARM BELLS



FIG. 866

List Number	Diameter	Weight, Complete	Price, Bronzed
1.....	15 inches	40 lbs	\$4.00
1.....	17 "	50 "	5.00
2.....	19 "	75 "	7.50
4.....	21 "	100 "	10.00

Nos. 1, 2 and 3 are mounted as shown in cut. No. 4 bell is furnished with two uprights for platform or belfry.

SCHOOL AND CHURCH BELLS



FIG. 867



FIG. 868

BELLS ARE NUMBERED BY THE DIAMETER IN INCHES

List Number and Diameter in Inches	Weight of Bell only	Weight of Bell and Mountings	List Price	List Number and Diameter in Inches	Weight of Bell only	Weight of Bell and Mountings	List Price
School Bells, 20	110	165	\$16.00	Church Bells, 34	487	765	\$90.00
" " 22	122	205	20.00	" " 36	605	950	110.00
" " 24	153	250	25.00	" " 38	660	1010	125.00
" " 26	220	350	40.00	" " 40	800	1300	150.00
" " 28	294	450	50.00	" " 42	915	1480	165.00
				" " 44	1062	1790	200.00
Church Bells, 30	336	570	65.00	" " 48	1430	2280	250.00
" " 32	388	640	75.00	" " 54	2060	3150	375.00

The weight and prices above named are for complete bells, and include wood sills, wheel for rope, and for Nos. 30, 32, 34, 36, 38, 40, 42, 44, 48 and 54, tolling-hammer without extra charge. Tolling-hammers, for Nos. 24, 26 and 28, when so ordered, 5.00 each extra. All sizes, except Nos. 20 and 22, have springs.

GARDNER GOVERNORS

Class A



FIG. 869

Spring
Class A

FIG. 871

STANDARD GOVERNORS—MEDIUM SPEED

Size.....inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Class A, plain.....each	.....	.....	24.50	29.50	36.00	42.00	48.00	59.00	71.00
Class A, finished.....each	.....	.....	27.50	33.50	40.00	47.00	53.00	67.00	80.00
Class B, plain.....each	16.00	18.00	21.00	25.00	30.00	35.00	40.00	50.00	60.00
Class B, finished.....each	18.00	20.00	24.00	29.00	34.00	40.00	45.00	58.00	69.00

Size.....inches	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
Class A, plain...ea.	83.00	96.00	109.00	140.00	170.00	210.00	241.00	270.00	335.00
Class A, finished...ea.	93.00	107.00	121.00	154.00	186.00	227.00	261.00	290.00	355.00
Class B, plain...ea.	71.00	83.00	94.00	122.00	150.00	185.00	215.00	240.00	.....
Class B, finished...ea.	81.00	94.00	106.00	136.00	166.00	202.00	235.00	260.00	.....

Class A is with automatic stop and class B is without automatic stop.

Prices on sizes 13 to 16 inches inclusive, class A will be sent on application.

SPRING GOVERNORS—HIGH SPEED

Size.....inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$
Class A, plain.....each	.....	18.50	21.00	24.50	29.50	36.00	42.00	48.00
Class A, finished.....each	.....	20.50	23.00	27.50	33.50	40.00	47.00	53.00
Class B, plain.....each	14.00	16.00	18.00	21.00	25.00	30.00	35.00	40.00
Class B, finished.....each	16.00	18.00	20.00	24.00	29.00	34.00	40.00	45.00

Size.....inches	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	.....
Class A, plain.....each	59.00	71.00	83.00	96.00	109.00	140.00	170.00	.....
Class A, finished.....each	67.00	80.00	93.00	107.00	121.00	154.00	186.00	.....
Class B, plain.....each	50.00	60.00	71.00	83.00	94.00	122.00	150.00	.....
Class B, finished.....each	58.00	69.00	81.00	94.00	106.00	136.00	166.00	.....

Class A is with automatic stop and class B is without automatic stop.

Gardner horizontal spring governors, for either horizontal or vertical pipe, furnished with straight-way or angle valve chambers and flanged or screwed openings. Prices same as spring class B.

Spring governors only made in class B type.

PICKERING GOVERNOR WITH BALL SPEED RANGER CHANGE IN ENGINE SPEED WITHOUT CHANGE IN PULLEY

CLASS B



FIG. 872

Class B represents Governor with Speed Ranger by use of which the speed of Engine can be varied while in motion. Sawyers Lever is also included.

CLASS A



FIG. 873

Class A, to which is added the Automatic Safety Stop. This Stop closes valve when belt breaks or runs off Pulley and is simple and certain in its action.

The Automatic Stop Motion can be added to any Class B Governor of Ball Ranger type by the user, without removing Governor from Engine. It is simply necessary to order the Automatic parts which are supplied at a moderate charge.

Governor	Class B, Plain	Class B, Finished	Class A, Plain	Class A, Finished	Diam. Base Flange	Diam. Side Flange	Speed of Governor	Diam. of Pulley	Width of Belt
$\frac{1}{2}$ Inch	\$14.00	\$16.00	\$16.50	\$18.50	Screw (or $3\frac{1}{2}$)	Screw	550	2	$\frac{3}{4}$
$\frac{3}{4}$ "	16.00	18.00	18.50	20.50	Screw (or $3\frac{1}{2}$)	Screw	600	2	$\frac{3}{4}$
1 "	18.00	20.00	21.00	23.00	Screw (or $4\frac{1}{2}$)	Screw	350	$2\frac{1}{2}$	$1\frac{1}{4}$
$1\frac{1}{4}$ "	21.00	24.00	24.50	27.50	Screw (or 5)	Screw	350	$2\frac{1}{2}$	$1\frac{1}{4}$
$1\frac{1}{2}$ "	25.00	29.00	29.50	33.50	$5\frac{3}{4}$	Screw	380	$3\frac{1}{2}$	$1\frac{1}{2}$
2 "	30.00	34.00	36.00	40.00	$6\frac{1}{2}$	Screw	380	$3\frac{1}{2}$	$1\frac{1}{2}$
$2\frac{1}{4}$ "	35.00	40.00	42.00	47.00	7	6	300	4	2
$2\frac{1}{2}$ "	40.00	45.00	48.00	53.00	$7\frac{1}{2}$	Screw (or $6\frac{1}{2}$)	300	4	2
3 "	50.00	58.00	59.00	67.00	9	8	340	4	2
$3\frac{1}{2}$ "	60.00	69.00	71.00	80.00	10	$8\frac{1}{2}$	340	4	2
4 "	71.00	81.00	83.00	93.00	11	$9\frac{1}{2}$	320	5	$2\frac{1}{2}$
$4\frac{1}{2}$ "	83.00	94.00	96.00	107.00	11	10	320	5	$2\frac{1}{2}$

WATERS ENGINE GOVERNOR

Class B



FIG. 874

Class A



FIG. 875

Governors are described in two classes, "B" and "A." Class B without stop motion and Class A with Automatic stop motion. Class B will be sent unless otherwise ordered. Can furnish Angle or Horizontal Valve Chambers with screwed or flanged ends as desired. Up to and including $1\frac{1}{2}$ -inch size will be sent with angle chambers, screwed ends; 2-inch size with screwed side and flanged base, and $2\frac{1}{2}$ inch and larger sizes, with both openings flanged unless otherwise specified. Give the number of revolutions the engine is to run and the diameter of the pulley on the crank-shaft which drives the governor, and a pulley the proper size for the governor will be sent. When no information is given a pulley flange will be sent.

PRICE LIST OF CLASS "A" AND "B" GOVERNORS

Size of Governor—Diameter of Opening	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$
Price, Class B, Plain.....	\$14.00	16.00	18.00	21.00	25.00	30.00	35.00	40.00
" " B, Finished.....	16.00	18.00	20.00	24.00	29.00	34.00	40.00	45.00
" " A, Plain.....	16.50	18.50	21.00	24.50	29.50	36.00	42.00	48.00
" " A, Finished.....	18.50	20.50	23.00	27.50	33.50	40.00	47.00	53.00

Size of Governor—Diameter of Opening	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	8	10
Price, Class B, Plain.....	\$50.00	60.00	71.00	83.00	94.00	122.00	185.00	240.00
" " B, Finished.....	58.00	69.00	81.00	94.00	106.00	136.00	202.00	260.00
" " A, Plain.....	59.00	71.00	83.00	96.00	109.00	140.00	210.00	270.00
" " A, Finished.....	67.00	80.00	93.00	107.00	121.00	154.00	227.00	290.00

Diam. of Pulley—In.	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	8	10
Width of Belt.....	$\frac{3}{4}$	1	1	$1\frac{1}{2}$	$1\frac{1}{2}$	2	2	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	3
Revolutions per Min.	500	400	400	325	325	320	320	250	250	250	140	140

NEW JUDSON 3-BALL GOVERNOR

DECIDED ADVANTAGES ARE FOUND IN USE OF NEW JUDSON
GOVERNORS ON STEAM AND GAS ENGINES

1. The governor being constructed correctly is positively responsive to the slightest changes in engine load and it is the closest regulator on the market.

2. Widest range in adjustment of engine speed, simply by manipulating handwheel on speeder, and requires no locknuts.

3. It is simple in construction and made of the best materials, and with care will last as long as an engine.



FIG. 876

Size .....inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{4}$	4
Diameter base flange	screw	$3\frac{1}{2}$ or screw	$3\frac{1}{2}$ or screw	$4\frac{1}{2}$ or screw	5	6	$6\frac{1}{2}$	$7\frac{1}{2}$	8	10	12
Diameter side flange	screw	screw	screw	screw	$4\frac{1}{2}$	5	6	7	$7\frac{1}{2}$	9	10
Speed of governor...	700	500	500	400	350	350	300	300	300	295	275
Diameter pulley.....	$1\frac{1}{2}$	$2\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{3}{4}$	3	3	$3\frac{1}{4}$	$3\frac{1}{4}$	$3\frac{1}{4}$	$3\frac{1}{2}$	$3\frac{1}{2}$
Width of belt.....	1	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{3}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$	2	2	2	$2\frac{1}{2}$	$2\frac{1}{2}$
Class B.....	\$14.00	14.00	16.00	18.00	21.00	25.00	30.00	40.00	50.00	60.00	71.00
Class A.....	.....	16.50	18.50	21.00	24.50	29.50	36.00	48.00	59.00	71.00	83.00

The Class A governor is with the automatic stop attachment and the Class B without it.

The automatic stop attachment is arranged for both horizontal and vertical engines, and we will ship horizontal arrangement, unless vertical is specified.

In ordering governors give speed of engine and diameter of engine pulley and we will put correct size on governor.

METROPOLITAN AUTOMATIC INJECTORS

Injector Model N



FIG. 877

Injector Repair Parts

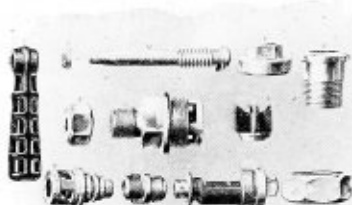


FIG. 878

INJECTORS—MODEL N

Number	Price, Each	Size of all Pipe Connection, Inches	Size Overflow or Waste Pipe, Inches	Capacity with 80 pnds Steam Pressure, 2-ft. Lift, Gallons	Horse Power for the Ordinary Type of Boiler and Engine	Horse Power on a Basis of 30 Pounds Evaporation Per H. P. Per Hour
2	\$15.00	$\frac{3}{8}$	$\frac{3}{4}$	60	4 to 6	5 to 8
3	16.00	$\frac{3}{8}$	$\frac{3}{4}$	80	6 " 8	8 " 12
$3\frac{1}{2}$	18.00	$\frac{1}{2}$	$\frac{3}{4}$	120	8 " 15	12 " 20
4	20.00	$\frac{1}{2}$	$\frac{3}{4}$	165	15 " 20	20 " 28
5	25.00	$\frac{3}{4}$	1	250	20 " 30	28 " 40
6	30.00	$\frac{3}{4}$	1	350	30 " 45	40 " 55
7	40.00	1	$1\frac{1}{4}$	500	45 " 65	55 " 80
8	45.00	1	$1\frac{1}{4}$	600	65 " 80	80 " 110
9	55.00	$1\frac{1}{4}$	$1\frac{1}{4}$	800	80 " 100	110 " 145
10	60.00	$1\frac{1}{4}$	$1\frac{1}{4}$	1000	100 " 130	145 " 180
11	75.00	$1\frac{1}{2}$	2	1300	130 " 170	180 " 235
12	90.00	$1\frac{1}{2}$	2	1750	170 " 230	235 " 300
13	110.00	2	$2\frac{1}{2}$	2300	230 " 300	300 " 400
14	125.00	2	$2\frac{1}{2}$	2850	300 " 375	400 " 500

INJECTOR REPAIR PARTS

Number	Price, Each										
	S Steam Jet	V Suction Jet	C.D.R. Combining & Delivery Tube & Auxiliary Check	P Overflow Valve	O Steam Plug	M Steam Valve and Stem	N Packing Nut	K Steam Valve Handle	A Coupling Nut	B Tail Piece	X Overflow Cap
2, 3	\$1.50	\$0.60	\$1.75	\$0.25	\$1.00	\$0.40	\$0.30	\$0.60	\$0.40	\$0.50	\$0.10
3, 4	1.70	.70	2.10	.50	1.25	.55	.40	.70	.80	.55	.10
5, 6	2.00	.90	2.75	.75	1.50	.75	.50	.80	1.20	.80	.10
7, 8	2.50	1.25	3.50	1.00	2.25	1.10	.65	1.60	1.65	1.20	.15
9, 10	3.75	1.85	4.50	1.25	3.50	1.75	.80	1.20	2.40	1.70	.15
11, 12	5.00	3.00	6.50	1.75	5.00	2.50	1.00	1.40	3.20	2.40	.15
13, 14	7.00	4.00	9.00	2.50	7.00	4.00	1.25	1.60	5.00	3.40	.20

Always state the size, number of the injector, model letter and serial or factory number.

THE METROPOLITAN INJECTOR. MODEL O

In addition to the remarkable working qualities of this injector, the construction commands special attention, for besides its durable construction and the ease with which repairs can be made, there are special safety devices which make the injector less liable to be affected by the failure of the valves in the piping.

The form and location of the overflow valve is such that even under the most adverse conditions the injector is freely started, and that sensitiveness apparent in most double-tube injectors in starting at times is entirely obviated.

The check valve used is a radical departure and improvement. We have recognized that the horizontal line check valve which has been used in all injectors is wrong in principle, unreliable and inefficient, especially with the high pressures common the past few years.

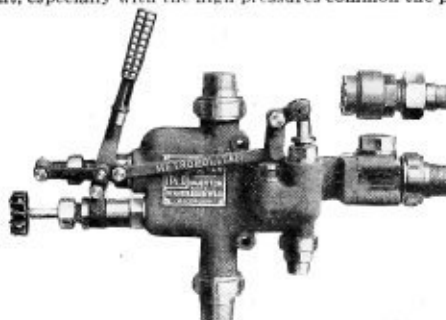


FIG. 879

The check valve used is a vertical valve guided top and bottom, extra heavy, with large opening, and the casing for same is independent of the main injector casing, and joined to it by a flanged joint; this arrangement permits the check valve to be examined and reground at any time, and also permits the injector proper being removed without removing the check valve from the delivery pipe.

By taking the injector apart at the flanged joint it gives a large opening through which the forcing tubes are examined or removed.

This injector is equipped with our special regulator, by which the capacity can be regulated. This regulator increases or decreases the amount of steam admitted to the lifting tubes and forms a most efficient means for the regulation of the capacity. The capacity can be reduced from 50 to 90 per cent., according to the conditions.

This injector is made extra heavy throughout and especially recommended for the highest steam pressures, hot feed water, and severe conditions. It is without an equal in efficiency, reliability and durability. It is our latest production, the result of our long experience. It is the highest possible standard for an injector.

Sizes	5½"	6½"	7½"	8½"	9½"	10½"	11½"
Prices Model O.....each	25.00	30.00	40.00	45.00	55.00	60.00	75.00
Sizes of all Pipe Connections.....inches	¾"	¾"	1"	1"	1¼"	1¼"	1½"
Size Overflow or Waste Pipe.....inches	¾"	¾"	¾"	¾"	1"	1"	1¼"
Capacity per Hour with 100 lbs. Steam Pressure.....gallons	260	365	525	625	835	1040	1350
Capacity per Hour with 175 lbs. Steam Pressure.....gallons	300	415	600	730	950	1195	1550
Horse-power for the Ordinary Type of Boiler and Engine.....	20-30	30-45	45-65	65-80	80-100	100-130	130-170
Horse-power on a Basis of 30 lbs. Evaporation per H.-P. per Hour.....	28-40	40-55	55-80	80-110	110-145	145-180	180-235

Sizes	12½"	13½"	14½"	15½"	16½"	17½"	18½"
Prices Model O.....each	90.00	110.00	125.00	150.00	200.00	250.00	300.00
Sizes of all Pipe Connections.....inches	1½"	2"	2½"	2½"	3"	3"	3½"
Size Overflow or Waste Pipe.....inches	1½"	1½"	1½"	2"	2½"	2½"	2½"
Capacity per Hour with 100 lbs. Steam Pressure.....gallons	1800	2350	2900	3600	4300	4900	5500
Capacity per Hour with 175 lbs. Steam Pressure.....gallons	2070	2675	3275	3975	4750	5300	6100
Horse-power for the Ordinary Type of Boiler and Engine.....	170-230	230-300	300-375	375-500	500-650	650-800	800-1000
Horse-power on a Basis of 30 lbs. Evaporation per H.-P. per Hour.....	235-300	300-400	400-500	500-650	650-800	800-975	975-1250

We send a flat strainer with sizes Nos. 6½ to 10½ inclusive.

THE METROPOLITAN "1898" LOCOMOTIVE INJECTOR

MODEL H



FIG. 880

This injector is designed to secure the greatest possible range; mechanically constructed to best resist wear, to be easily repaired and not to be affected by the varying steam pressures and conditions met with in locomotive service. It will start at 35 lbs. steam pressure and works at all steam pressures with absolutely no adjustment, up to 350 lbs. When in operation there can be no waste of water at the overflow as all of the water must go through the delivery pipe into the boiler. When working with hot feed water this injector has no equal. At steam pressures up to 200 lbs., it will handle feed water at 125 degrees Fahr. This feature shows the adaptability of this injector to locomotive service where the feed water is likely to become hot.

Its operation for all conditions and all steam pressures is the same. To start the injector, draw the lever back slightly to lift the water, then draw it back to the stop. By means of a regulating valve which is located directly under the lever, the capacity can be regulated for light or heavy service, thus enabling a constant feed to be maintained. This regulation of capacity can be accomplished with high steam pressures and hot feed water as well as with low steam pressures and cold feed water.

Size	Price	Capacity per Hour		Pipe Connections							
		Steam Pressures		Steam		Suction		Delivery		Overflow	
		160 Pounds	210 Pounds	Iron	Copper	Iron	Copper	Iron	Copper	Iron	Copper
1	\$ 35 00	255 gals.	263 gals.	$\frac{3}{4}$	$\frac{3}{8}$	$\frac{3}{4}$	$\frac{3}{8}$	$\frac{3}{4}$	$\frac{3}{8}$	$\frac{3}{4}$	$\frac{3}{8}$
2	40 00	370 "	380 "	$\frac{3}{4}$	$\frac{3}{8}$	$\frac{3}{4}$	$\frac{3}{8}$	$\frac{3}{4}$	$\frac{3}{8}$	$\frac{3}{4}$	$\frac{3}{8}$
3	50 00	585 "	600 "	1	$1\frac{1}{4}$	1	$1\frac{1}{8}$	1	$1\frac{1}{4}$	1	$1\frac{1}{8}$
4	60 00	700 "	720 "	1	$1\frac{1}{4}$	1	$1\frac{1}{8}$	1	$1\frac{1}{4}$	1	$1\frac{1}{8}$
5	75 00	1,180 "	1,210 "	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{1}{2}$	1	$1\frac{1}{4}$
6	90 00	1,605 "	1,647 "	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	1	$1\frac{1}{2}$
7	110 00	2,095 "	2,151 "	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$
8	125 00	2,651 "	2,723 "	2	2	2	$2\frac{1}{4}$	2	2	$1\frac{1}{2}$	$1\frac{1}{2}$
9	140 00	2,954 "	3,034 "	2	2	2	$2\frac{1}{4}$	2	$2\frac{1}{4}$	2	$2\frac{1}{4}$
10	160 00	3,961 "	4,068 "	2	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	2	$2\frac{1}{2}$	2	$2\frac{1}{2}$
11	190 00	4,700 "	4,810 "	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{3}{4}$	2	$2\frac{1}{2}$
12	220 00	5,700 "	5,950 "	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{3}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	2	$2\frac{1}{2}$

DIRECTIONS FOR ORDERING

In ordering, always state the size required. Specify whether the connections are for iron or copper pipe. The sizes for copper pipe given above are outside diameters. When not specified, we furnish nipples for copper steam pipe and iron suction and delivery pipe. Also state if it is necessary to locate the injector outside of the cab, as we furnish special cab lever extension handles and joints for this purpose.

PENBERTHY AUTOMATIC INJECTORS



FIG. 881

A perfect restarting automatic machine; meaning, if the current of water is broken by any cause, the injector will pick up the water and re-establish the current to the boiler without the least attention. Every machine is carefully tested, and will work on the following points: Start low, 20 to 22 lbs. steam on 3-foot lift. Work high, 165 to 170 lbs. steam on 3-foot lift. Lift water, 20 to 24 feet on 60 to 80 lbs. steam. Will deliver water to boiler at 160 to 212 degrees, according to temperature of feed water and steam pressure. Water 200 to 212 degrees can always be delivered at nearly all pressures over 50 lbs. by throttling suction valve and delivering minimum capacity. It is advisable in many cases to install an injector large enough so that the supply can be cut down and attain this result, thereby saving fuel. By placing a short piece of pipe having a stopcock, in the overflow, and closing after the injector is started, water 8 to 10 degrees hotter can be handled, but the injector is rendered non-automatic while the stopcock is closed.

Size	Price Each	H. P. Based on Ordinary Tubular Boiler	H. P. Based on 30 Lbs. Water per H. P. per Hour	Pipe Connections Inches	Gallons per Hour	
					1 to 3-Ft. Lift, 60 to 110 Lbs. Steam Pressure	
					Max.	Min.
O	\$15.00	3 to 6	4 to 8	1/4	60	35
OO	16.00	4 to 8	6 to 12	3/8	80	45
A	18.00	8 to 16	10 to 20	1/2	135	70
AA	20.00	12 to 22	15 to 30	3/4	180	100
B	25.00	17 to 32	22 to 45	1	260	140
BB	30.00	20 to 45	25 to 60	1 1/4	360	180
C	40.00	40 to 65	45 to 80	1 1/2	475	250
CC	45.00	45 to 80	50 to 100	1 3/4	600	325
D	55.00	50 to 100	60 to 135	2	800	425
DD	60.00	75 to 135	85 to 165	2 1/4	1000	525
E	75.00	100 to 180	125 to 235	2 1/2	1400	740
EE	90.00	115 to 255	150 to 320	3	1900	850
F	110.00	160 to 320	200 to 400	3 1/2	2400	1275
FF	125.00	200 to 400	250 to 500	4	3000	1600
G	150.00	300 to 500	325 to 600	4 1/2	3600	1875
GG	200.00	375 to 600	400 to 750	5	4200	2150



FIG. 882

REPAIR PARTS

Size of Injector	O	OO	A	AA	B	BB	C	CC	D	DD	E	EE	F	FF	G	GG
R—Steam Jet.....each	\$0.25	\$0.35	\$0.45	\$0.55	\$0.65	\$0.75	\$0.85	\$1.00	\$1.25	\$1.50	\$1.75	\$2.00	\$2.25	\$2.50	\$2.75	\$3.00
S—Suction Jet.....each	.25	.35	.45	.55	.65	.75	.85	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00
Y—Delivery Jet.....each	1.25	1.50	2.00	2.50	3.00	3.75	4.50	5.50	6.50	7.50	8.50	9.50	10.50	11.50	12.50	13.50
X—Coupling Nut.....each	.25	.30	.40	.50	.60	.75	.85	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00
V—Tail Pipe.....each	.25	.30	.40	.50	.60	.75	.85	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00
Z—Overflow Cap.....each	.30	.40	.50	.60	.70	.80	.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80
P—Overflow Valve.....each	.40	.50	.60	.75	.90	1.00	1.10	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25
N—Overflow Hinge.....each	.10	.10	.15	.15	.15	.20	.20	.20	.20	.20	.20	.20	.20	.20	.20	.20
O—Plug.....each	.60	.80	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25
Strainer.....each	.40	.45	.50	.55	.60	.75	.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Extra parts furnished for injectors numbered above 21000 without returning it to factory. In ordering parts do not fail to give serial letter and number, which will be found on top of overflow. In referring to or ordering parts, designate them by letter or name as per above.

U. S. AUTOMATIC INJECTORS

Regular Style

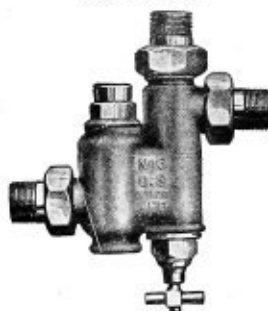


FIG. 383

The regular style goes on either side of the boiler. Special styles to fit any condition of piping can be furnished. A distinctive feature is the drip cock (see illustration) which has the following special advantages:

It drains the injector when not in use and thus prevents freezing.

By leaving it open you can start injector even though the check valve leaks. This is impossible without a drip cock. By opening the drip cock you can start up with lower steam. By leaving it open, when not in use, it prevents the suction pipe from getting hot or the jets from

limeing up when the steam or check valve leaks. It enables you to take hot water out of a hot suction pipe on a long lift. It is always handy for drawing hot water for any purpose when the injector is working.

Parts



FIG. 384

No.	Price, Each	H. P., Based on Ordinary Tubular Boiler		H. P., Based on 30 Lbs. Water per H.P. per Hour		Pipe Connections, Inches			Capacity Gallons per Hour	
						Steam	Supply	Delivery	Maximum	Minimum
00	\$13.00	1 to 3	1 to 4	1 to 4	1 to 4	1/4	1/4	1/4	36	20
0	14.00	3 to 6	4 to 8	4 to 8	4 to 8	3/8	3/8	3/8	65	35
1	16.00	4 to 8	6 to 12	6 to 12	6 to 12	1/2	1/2	1/2	90	55
2	18.00	8 to 16	10 to 20	10 to 20	10 to 20	3/4	3/4	3/4	135	65
3	20.00	12 to 22	15 to 30	15 to 30	15 to 30	1	1	1	180	100
4	25.00	17 to 32	22 to 45	22 to 45	22 to 45	1 1/4	1 1/4	1 1/4	260	140
5	30.00	20 to 45	25 to 60	25 to 60	25 to 60	1 1/2	1 1/2	1 1/2	355	170
6	40.00	40 to 65	45 to 80	45 to 80	45 to 80	2	2	2	475	300
7	45.00	45 to 80	50 to 100	50 to 100	50 to 100	2 1/2	2 1/2	2 1/2	600	350
8	55.00	50 to 100	60 to 135	60 to 135	60 to 135	3	3	3	800	425
9	60.00	75 to 135	85 to 165	85 to 165	85 to 165	3 1/2	3 1/2	3 1/2	1000	525
10	75.00	100 to 180	125 to 235	125 to 235	125 to 235	4	4	4	1400	800
11	90.00	115 to 255	150 to 320	150 to 320	150 to 320	4 1/2	4 1/2	4 1/2	1900	950
12	110.00	160 to 320	200 to 380	200 to 380	200 to 380	5	5	5	2400	1300
13	125.00	200 to 400	250 to 500	250 to 500	250 to 500	6	6	6	3000	1600
14	150.00	300 to 500	325 to 550	325 to 550	325 to 550	7	7	7	3600	2000
15	175.00	350 to 550	400 to 600	400 to 600	400 to 600	8	8	8	4000	2200
16	200.00	400 to 600	500 to 750	500 to 750	500 to 750	9	9	9	4500	2500
17	300.00	550 to 900	600 to 1000	600 to 1000	600 to 1000	10	10	10	6000	3000

U. S. INJECTOR PARTS

Size of Injector	No.	00 to 3	4 and 5	6 and 7	8 and 9	10 and 11	12 to 14
D—Tail pipe	each	\$0.30	.35	.40	.50	.75	1.00
E—Tail pipe nut	each	\$0.30	.40	.50	.65	.85	1.20
A—Steam jet	each	\$0.80	1.00	1.15	1.35	1.60	2.00
B—Suction jet	each	\$0.50	.75	1.25	1.50	1.75	2.00
C—Delivery tube	each	\$1.00	1.10	1.45	1.75	2.00	2.50
F—Delivery cap	each	\$1.00	1.10	1.45	1.75	2.00	2.50
G—Overflow cap and							
H—valve	each	\$0.80	.95	1.00	1.25	1.50	2.00

In ordering U. S. injector parts, always give size and shop number, and specify the parts by the names given above; use no other terms.

THE LEADER INJECTOR

EVERY INJECTOR TESTED AND FULLY GUARANTEED

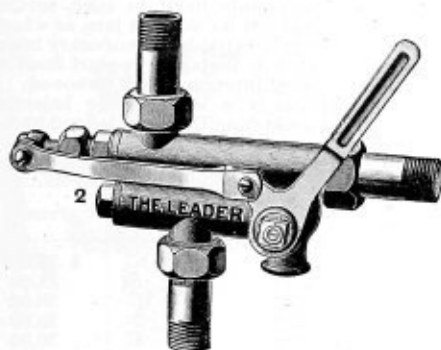


FIG. 885

No. of Injector	Size of Pipes		Horse- power of Boiler will Feed	Gals. per Hour, 60 lbs. Steam	List Price
	Steam Pipe	Suct'n & Feed			
1	3/4	3/4	3 to 7	60	16.00
2	1	1	7 " 10	90	18.00
3	1 1/4	1 1/4	12 " 18	150	22.00
4	1 1/2	1 1/2	18 " 25	220	25.00
5	1 3/4	1 3/4	25 " 35	300	30.00
6	2	2	35 " 45	400	35.00
7	2 1/4	2 1/4	45 " 60	500	40.00
8	2 1/2	2 1/2	60 " 70	600	45.00
9	2 3/4	2 3/4	70 " 90	750	55.00
10	3	3	100 " 125	1000	65.00
11	3 1/4	3 1/4	125 " 150	1300	75.00
12	3 1/2	3 1/2	150 " 200	1800	90.00

WHEN ORDERING AN INJECTOR PLEASE STATE

- First. The horse-power of your boiler and engine.
 Second. Give steam pressure carried.
 Third. If water is taken under pressure or lift.
 Fourth. If water is to be lifted give the lift or distance from the injector to the water supply, both vertically and horizontally.

IN ORDERING REPAIRS, PLEASE GIVE THE STOCK NUMBER

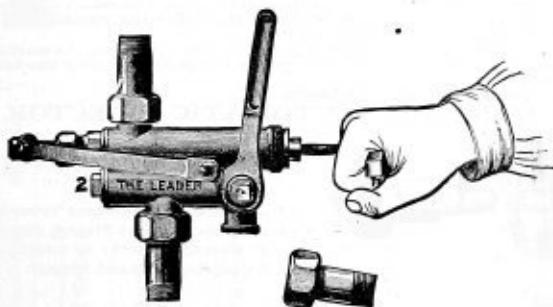


FIG. 886

This cut shows clearly how easily we can remedy two very frequent causes for the failure of all styles and makes of Injectors. Our leader is the only Injector ever made that can be so quickly and effectually cleaned from dirt or lime scale without having to be returned to the factory or even removed from the boiler.

THE "LEADER" JET PUMP OR EJECTOR



FIG. 887

No.	Suction	Discharge	Steam	Gallons Per Hour	List Price
1	1	1 1/4	1/2	900	9.00
2	1 1/4	1 3/4	3/4	1200	12.00
3	1 1/2	2	1	1800	15.00
4	2	2 1/2	1 1/2	2400	18.00

GARFIELD AUTOMATIC INJECTOR



FIG. 888

This Injector is adapted to every condition of Steam Boiler feeding service, whether lifting or taking water under pressure, and particularly commends itself to such service where it is subject to sudden jars, or where the water supply is liable to temporary interruptions. It will instantly re-start itself as soon as cause of interruption is removed.

The Garfield is a straight-line Injector, and dirt or scale from the pipes lodged in the tubes can be seen and usually removed without taking the Injector apart.

Size No.	Iron Pipe Connections			Capacities		Price
	Steam	Supply	Delivery	Gallons per Hour	Horse Power	
00	in.	in.	in.	60	2 to 5	\$ 16.00
0	"	"	"	90	5 " 10	18.00
1	"	"	"	120	10 " 15	20.00
2	"	"	"	220	15 " 24	25.00
3	"	"	"	300	24 " 35	30.00
4	"	1 "	1 "	420	35 " 50	40.00
5	"	1 "	1 "	540	50 " 65	45.00
6	1 "	1 "	1 "	720	65 " 90	55.00
7	1 "	1 "	1 "	900	90 " 115	60.00
8	1 1/2 "	1 1/2 "	1 1/2 "	1200	115 " 150	75.00
9	1 1/2 "	1 1/2 "	1 1/2 "	1700	150 " 200	90.00
10	1 1/2 "	2 "	2 "	2200	200 " 275	110.00
11	1 1/2 "	2 "	2 "	2800	275 " 350	125.00
12	2 "	2 1/2 "	2 1/2 "	3400	350 " 425	150.00
13	2 "	2 1/2 "	2 1/2 "	4000	425 " 500	180.00
14	2 "	2 1/2 "	2 1/2 "	4500	500 " 600	200.00

These capacities are obtained by actual measurement on the following basis:

Steam 80 to 100 lbs.; lift 4 feet, feed water 76 degrees.

NOTE.—The actual capacities exceed the listed and are fully equal to any Injector on the market of same size, pipe connections and price. When desired, the capacity can be reduced about one-half by throttling water by valve in supply pipe.

NOTE.—Listed capacities not changed to deceive purchasers.

REPAIR PARTS GARFIELD AUTOMATIC INJECTOR



PRINCIPAL PARTS OF THE AUTOMATIC INJECTOR

1, Lifting Tube; 2, Combining Tube; 3, Delivery Tube; 4, Check Plate; 5, Steam Cap; 6, Overflow Check; 8, Overflow Cap; 9, Coupling (Nut and Nipple).

FIG. 889

Size No.	Part 1 Lifting Tube	Part 2 Combining Tube	Part 3 Delivery Tube	Part 4 Check Plate	Part 5 Steam Cap	Part 7 Overflow Check	Part 8 Overflow Check Cap	Parts 9 & 10 Couplings	
								Nut	Nipple
00	\$1.00	\$0.90	\$0.80	\$0.40	\$5.00	\$0.30	\$0.35	\$0.40	\$0.40
0	1.10	1.00	.90	.50	6.00	.35	.40	.40	.40
1	1.20	1.10	1.00	.60	7.00	.40	.45	.50	.50
2	1.70	1.60	1.50	.70	8.00	.50	.60	.50	.50
3	1.90	1.80	1.70	.75	9.00	.55	.65	.50	.50
4	2.45	2.35	2.25	.80	10.00	.60	.75	.60	.60
5	2.65	2.55	2.45	.85	11.00	.65	.80	.60	.60
6	3.20	3.10	3.00	.90	13.00	.75	.90	.80	.80
7	3.40	3.30	3.20	.95	14.00	.80	.95	.80	.80
8	4.00	4.50	4.40	1.00	15.00	.85	1.00	1.60	1.40
9	4.80	4.70	4.60	1.10	16.00	.90	1.15	1.60	1.40
10	5.35	6.25	6.15	1.20	18.00	1.00	1.25	2.40	2.00
11	6.60	6.50	6.40	1.25	19.00	1.10	1.30	2.40	2.00
12	9.00	8.75	8.50	1.30	20.00	1.15	1.35	3.00	2.40
13	9.10	9.00	8.75	1.35	22.00	1.20	1.40	3.00	2.40
14	9.25	9.10	9.00	1.40	24.00	1.25	1.50	3.00	2.40

When ordering repairs be particular in giving size number of Injector, name and number of part and class of Injector (Automatic or Double Jet) for which repairs are wanted. Also when ordering part 9, nut or nipple, always specify if for steam, supply or delivery connection.

THE GARFIELD DOUBLE JET INJECTOR



FIG. 890

Number of Injector	Size of Connections		Capacities		Price
	Steam	Supply & Delivery	Gals. per Hour	Horse Power	
00	3/8	3/8	80	4 to 11	\$16 00
0	1/2	1/2	135	10 to 19	18 00
1	3/4	3/4	180	15 to 24	20 00
2	1	1	260	18 to 34	25 00
3	1 1/4	1 1/4	355	20 to 47	30 00
4	1 1/2	1 1/2	475	40 to 64	40 00
5	2	2	600	45 to 80	45 00
6	2 1/4	2 1/4	800	55 to 106	55 00
7	2 1/2	2 1/2	1000	75 to 134	60 00
8	3	3	1400	100 to 181	75 00
9	3 1/2	3 1/2	1900	115 to 234	90 00
10	4	4	2400	150 to 320	110 00
11	4 1/2	4 1/2	3000	190 to 400	125 00
12	5	5	3900	275 to 480	150 00
13	5 1/2	5 1/2	4300	375 to 590	180 00
14	6	6	4500	400 to 690	200 00

These capacities are obtained by actual measurements on the following basis: Steam 80 to 100 pounds, lift 4 feet, and feed water 76 degrees Fahr. The actual capacities are in excess of the list, and fully equal to any of the same size, connections and price.

REPAIR PARTS GARFIELD DOUBLE JET INJECTOR

Upper Set

Lower Set

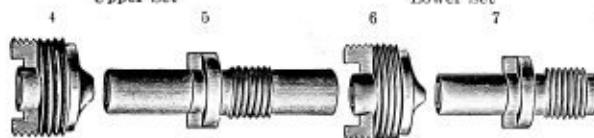


FIG. 891

PRINCIPAL PARTS

1. Relief Valve; 2. Steam Valve; 3. Overflow Valve; 4. Forcing Tube; 5. Forcing Tube; 6. Lower Steam Jet; 7. Lifting Tube; 8. Cap; 9. Couplings (Nipple and Nut).

Size No.	Part 1. Relief Valve	Part 2. Steam Valve	Part 3. Overflow Valve	Part 4. Upper Steam Jet	Part 5. Forcing Tube	Part 6. Lower Steam Jet	Part 7. Lifting Tube	Part 8. Cap	Coupling Part 9	
									Nut	Nipple
00	\$0 60	\$0 90	\$0 60	\$0 75	\$0 90	\$0 75	\$0 90	\$0 50	\$0 40	\$0 40
0	80	1 20	80	90	1 10	90	1 10	50	40	40
1	1 00	1 40	1 00	1 10	1 30	1 10	1 30	55	50	50
2	1 20	1 80	1 20	1 30	1 60	1 30	1 60	60	50	50
3	1 40	2 00	1 40	1 50	1 80	1 50	1 80	65	50	50
4	1 80	2 25	1 80	1 60	2 00	1 60	2 00	70	60	60
5	2 00	2 50	2 00	1 80	2 20	1 80	2 20	75	60	60
6	2 20	3 00	2 20	1 90	2 35	1 90	2 35	80	80	80
7	2 40	3 25	2 40	2 10	2 50	2 10	2 50	85	80	80
8	2 60	3 50	2 60	2 30	2 85	2 30	2 85	90	1 00	1 40
9	3 00	4 00	3 00	2 50	3 00	2 50	3 00	95	1 00	1 40
10	3 20	4 40	3 20	2 60	3 10	2 60	3 10	1 00	2 40	2 00
11	3 40	4 80	3 40	2 70	3 20	2 70	3 20	1 05	2 40	2 00
12	3 60	5 00	3 60	2 80	3 30	2 80	3 30	1 10	3 00	2 40
13	3 80	5 20	3 80	2 90	3 40	2 90	3 40	1 15	3 00	2 40
14	4 00	5 40	4 00	3 00	3 50	3 00	3 50	1 20	3 00	2 40

In removing jets or tubes, use the wrench which accompanies each injector.

When ordering repairs be particular to give size number of injector, name and number of part and class of injector (Automatic or Double Jet) for which repairs are wanted. Also when ordering part 9 nut or nipple always specify if for steam supply or delivery connection.

SELLERS CLASS N INJECTORS

FOR RAILROAD SERVICE, IRON AND STEEL MILLS, LOGGING
ROADS, STATIONARY BOILERS

SELF-ACTING FORM

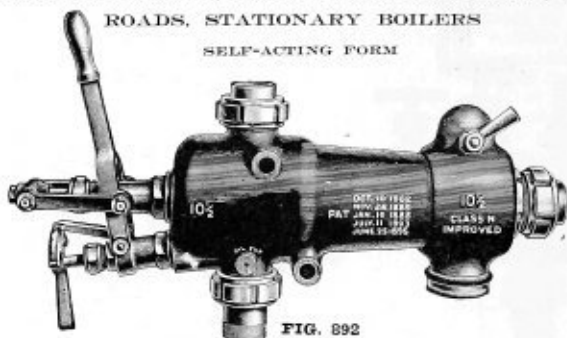


FIG. 892

Pennsylvania Railroad Standard, Class N Improved and Class M interchangeable with other forms.

Size No	List Price	Capacity in Gallons Per Hour—Lift, 5 Feet		Size of Pipes in Inches	
		120 Pounds Steam	200 Pounds Steam	Iron	Copper
3 1/2	30.00	309	332	3/4	1
4 1/2	42.00	562	610	1 1/4	1 1/2
5 1/2	55.00	907	1035	1 1/2	1 3/4
6 1/2	70.00	1320	1516	1 3/4	2
7 1/2	85.00	1755	2010	2	2 1/4
8 1/2	100.00	2250	2587	2 1/4	2 3/4
9 1/2	115.00	2820	3187	2 3/4	3
10 1/2	130.00	3450	3952	3	3 1/4
11 1/2	145.00	4132	4725	3 1/4	3 3/4
12 1/2	160.00	4968	5700	3 3/4	4

SELLERS RESTARTING INJECTOR

CAPACITIES, HORSE-POWER AND PIPE SIZE



FIG. 893

Size No.	List Price	Size of Pipe Inch's	Capacity at 80 Lbs. Steam, Lifting 5 Feet	Horse- power
			Gallons Per Hour	
16	18.00	3/4	56	2 to 6
20	21.00	1	95	6 " 15
23	23.50	1 1/4	127	10 " 20
27	26.50	1 1/2	176	15 " 30
33	33.00	1 3/4	263	20 " 40
40	39.50	2	386	30 " 45
45	50.00	2 1/4	488	45 " 65
50	59.00	2 1/2	603	65 " 90
57	70.00	3	784	80 " 120
64	78.00	3 1/4	988	100 " 140
73	95.00	3 1/2	1350	140 " 175
80	115.00	4	1773	175 " 240
98	140.00	5	2300	240 " 300
110	160.00	6	2900	300 " 400
120	180.00	8	3450	400 " 550

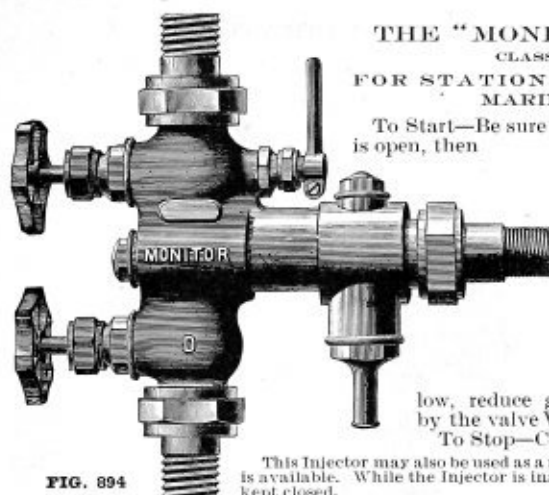


FIG. 894

THE "MONITOR" INJECTOR

CLASS D LIFTING

FOR STATIONARY, PORTABLE AND MARINE BOILERS

To Start—Be sure the Water Valve or Cock W is open, then

First—Open the jet Valve J until the water flows out of the overflow O.

Second—As soon as the water appears at the overflow, open the main steam valve S, and close the jet valve J.

N. B.—Should water still be discharged from the overflow, as may be the case where the steam pressure is

low, reduce gradually the water supply by the valve W until the discharge ceases.

To Stop—Close the main steam valve.

This Injector may also be used as a non-lifting where a head of water is available. While the Injector is inactive, the steam valve should be kept closed.

Size of Injector	Inside Diameter of Pipe in Inches	Delivery per hour in Gallons, at a steam pressure of			Price, Class D, Monitor, Lifting
		120 Lbs.	60 Lbs.	20 Lbs.	
No. 2	1/2	170	135	90	19.00
" 2 1/2	1 1/2	255	210	120	24.00
" 3	3/4	375	285	195	32.00
" 4	1	615	480	315	45.00
" 5	1 1/4	900	690	450	55.00
" 6	1 1/4	1230	960	570	65.00
" 7	1 3/4	1650	1260	840	80.00
" 8	1 1/2	2130	1590	1050	100.00
" 9	2	2640	1980	1310	120.00
" 10	2	3240	2465	1635	140.00
" 12	2 1/2	4320	3300	2350	180.00
" 14	2 1/2	6100	4650	3200	225.00
" 16	3	8050	6050	4180	275.00
" 18	3	9850	7550	5390	350.00
" 20	3 1/2	12000	9420	6530	450.00

These Injectors are fitted with Steam and Water Valves, which are usually separate and charged extra.

GRESHAM'S NEW PATENT
AUTOMATIC RESTART-
ING INJECTORS
FOR STATIONARY, PORTABLE
AND MARINE BOILERS



FIG. 895

No.	Size of Pipe Connections in inches.		Gallons per hour at a Steam Pressure of		Price
	Steam	Delivery and Suction	60 Lbs.	80 Lbs.	
24	1/2	1/2	100	125	12.00
30	1/2	1/2	140	160	15.00
36	1/2	1/2	200	225	18.00
48	3/4	3/4	300	390	24.00
60	1	1	440	510	32.00
66	1 1/4	1 1/4	600	660	40.00
72	1 1/4	1 1/4	720	825	48.00
84	1 1/2	1 1/2	885	1000	56.00
96	1 1/2	1 1/2	1200	1440	66.00
108	1 1/2	2	1550	1725	76.00
120	2	2	1900	2175	90.00

THE HANCOCK INSPIRATOR

"STATIONARY" TYPE

FOR STATIONARY, MARINE AND PORTABLE BOILERS



FIG. 896

Adapted for a wider range of service than any other known device.

Operated by three handles, but simpler in construction, more efficient, durable and economical than any other injector.

Will lift water 25 feet or take it under a head.

No adjustment of either steam or water supply for varying steam pressures.

Will deliver the water at either high or low temperature, as desired.

Guaranteed to be the most efficient apparatus for universal service now in use.

Sizes	Prices Stat'y Type	Pipe Connections			Capacity Per Hour With 60 Pounds Steam Pressure Gals.	Horse-Power	
		Steam	Suction and Delivery	Over- flow		For the Ordinary Type of Boiler and Engine	On a Basis of 30 Pounds Evaporation Per Horse Power Per Hour
7½	\$16.00	¾	¾	¼	60	4 to 6	5 to 8
8¾	18.00	¾	½	¾	90	6 to 8	8 to 15
10	20.00	¾	½	¾	120	8 to 15	15 to 25
12½	25.00	½	¾	½	220	15 to 30	25 to 35
15	30.00	½	¾	½	300	30 to 40	35 to 60
17½	40.00	¾	1	¾	420	40 to 60	60 to 75
20	45.00	¾	1	¾	540	60 to 75	75 to 100
22½	55.00	1	1¼	1	720	75 to 90	100 to 130
25	60.00	1	1¼	1	900	90 to 120	130 to 175
30	75.00	1¼	1½	1¼	1260	120 to 165	175 to 235
35	90.00	1¼	1½	1¼	1740	165 to 230	235 to 300
40	110.00	1½	2	1½	2230	230 to 300	300 to 400
45	125.00	1½	2	1½	2820	300 to 375	400 to 500
50	150.00	2	2¼	2	3480	375 to 500	500 to 650
55	175.00	2	2½	2	3650	500 to 600	650 to 700

HANCOCK INSPIRATOR PARTS STATIONARY TYPE

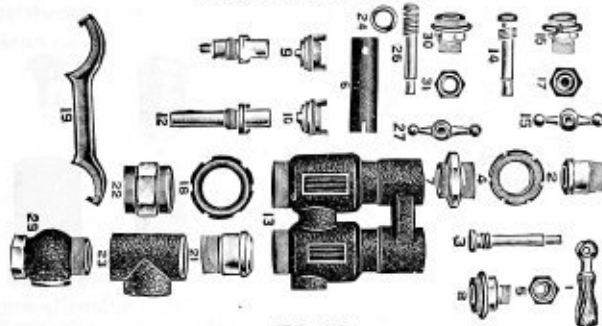


FIG. 897

No. of Part	Description	Size of Inspirator							
		7½	8½, 10	12½, 15	17½, 20	22½, 25	30, 35	40, 45	50, 55
1	Handle for top bonnet.....	\$0.75	\$0.75	\$0.90	\$1.05	\$1.40	\$1.90	\$2.40	\$2.90
2	Nipple for steam connection	.40	.40	.50	1.00	1.30	2.00	2.40	3.15
3	Stem for top bonnet.....	.90	.90	1.60	2.50	3.50	4.50	5.20	6.00
4	Coupling for steam connect'n	.70	.70	.85	1.20	1.75	2.40	3.00	4.25
5	Packing nut for top bonnet..	.50	.50	.60	.70	.80	1.00	1.20	1.50
6	Jet wrench	.20	.20	.30	.40	.50	.80	1.15	1.95
7	Union	.35	.95	1.35	1.75	2.40	3.95	6.10	9.20
8	Top bonnet	.80	.80	1.40	2.00	2.60	3.40	4.40	5.60
9	Lifter steam jet.....	.60	.60	.75	.90	1.70	2.25	3.00	5.50
10	Forcer steam jet.....	.85	.85	1.00	1.25	1.80	2.30	3.75	7.40
11	Lifter tube	1.20	1.20	1.40	1.75	2.50	4.00	6.00	9.00
12	Forcer tube	1.50	1.50	2.00	2.50	3.50	5.00	7.50	12.00
13	Body								
14	Stem for overflow bonnet...	.90	.90	1.60	2.30	3.00	4.50	5.20	5.90
14B	Disc for part 14.....							2.30	3.15
15	Handle for overflow bonnet..	.60	.60	.70	.80	.90	1.00	1.10	1.20
16	Overflow bonnet	.80	.80	1.40	2.00	2.60	3.30	4.10	4.70
17	Packing nut for overflow bonnet	.50	.50	.60	.70	.80	1.00	1.20	1.40
18	Coupling for suction and delivery	.70	.85	1.20	1.75	2.40	3.00	4.25	5.50
19	Spanner wrench				.80	.90	1.20	1.40	1.60
21	Nipple for suction and delivery	.40	.50	1.00	1.30	2.00	2.40	3.15	4.25
22	Malleable iron coupling for suction	.30	.40	.50	.60	.75			
23	Malleable iron tee for delivery	.30	.40	.50	.80	1.10	1.55	2.65	4.55
24	Swivel for overflow valve.....					.40	.75	1.20	3.25
26	Stem for overflow valve.....	.90	.90	1.60	2.50	3.50	4.50	5.20	6.00
27	Handle for overflow valve....	.60	.60	.70	.80	.90	1.00	1.10	1.20
29	Body for overflow valve.....	1.10	1.10	1.50	2.40	3.30	4.80	6.90	9.00
30	Bonnet for overflow valve....	.90	.90	1.60	2.50	3.50	4.50	5.20	6.00
31	Packing nut for overflow valve	.50	.50	.60	.70	.80	1.00	1.20	1.50
32	Parts 1, 3, 5 and 8.....	2.95	2.95	4.50	6.25	8.30	10.80	13.20	16.00
33	Parts 14, 15, 16 and 17.....	2.80	2.80	4.30	5.80	7.30	9.90	14.20	17.25
34	Parts 24, 26, 27, 29, 30 and 31	4.00	4.00	6.00	8.90	12.40	16.55	20.80	26.95
35	Parts 9, 10, 11 and 12.....	4.15	4.15	5.15	6.40	9.50	13.55	20.25	33.90
36	Parts 18, 21 and 22.....	1.40	1.75	2.70	3.65	5.15	5.40	7.40	9.75
37	Parts 18, 21, 22 and 24.....	5.40	5.75	8.70	12.75	17.90	20.50	30.85	41.25

PENBERTHY "XL-96" IMPROVED EJECTORS

LIFT 22 TO 25 FEET

ELEVATE 25 TO 100 FEET, 30 TO 100 POUNDS PRESSURE



FIG. 898

Repair Parts



FIG. 899

The lifting and elevating power is so combined in the "XL-96" Ejector as to make it unquestionably the best device of its kind. The principle and power involved in so small, handy and economical an instrument, continually suggest new uses, which often demand that the tubes of the ejector be proportioned particularly for the service. We have perfected and can furnish special ejectors singularly efficient in the work for which they are designed.

No.	Steam Connection Inches	Suction and Discharge Inches	Capacity, Gallons per Hour				Vertical Lift Feet		Price, Each	
			3-Foot Lift		50-Foot Elevation	25-Foot Elevation				
			Steam Pressure, Pounds							
			40 to 65	20 to 40 or 65 to 100	40 to 65	40 to 65	40 to 75	25 to 40 or 75 to 100	Brass	Iron Body
1	$\frac{3}{8}$	$\frac{1}{2}$	240	235	120	180	23	20	\$ 8.00	.....
2	$\frac{1}{2}$	$\frac{3}{4}$	500	450	250	375	25	22	10.00	.....
3	$\frac{3}{4}$	1	840	700	420	625	25	22	15.00	.....
4	1	$1\frac{1}{4}$	1350	1300	650	950	25	22	20.00	.....
5	$1\frac{1}{2}$	$1\frac{1}{2}$	1950	1850	975	1450	25	22	25.00	\$20.00
6	$1\frac{1}{4}$	2	3500	3000	1750	2600	25	22	35.00	27.50
*7	$1\frac{1}{2}$	$2\frac{1}{2}$	5700	4350	2500	3750	25	22	50.00	40.00
*8	2	3	9500	8160	4750	7200	25	22	70.00	50.00
*9	2	$3\frac{1}{2}$	13600	12400	6800	10200	25	22	105.00	70.00
*10	$2\frac{1}{2}$	4	18400	17100	9200	13800	25	22	145.00	95.00

Sizes 5 and 6 will be sent in all brass, unless ordered with iron body and brass jets and steam connections.

*Unless ordered in brass, Sizes 7 to 10, inclusive, will be shipped with iron body, brass jets and steam connection.

TABLE SHOWING SIZE OF BOILERS REQUIRED FOR EJECTORS

Number of Ejector	1, 2, 3,	4, 5, 6,	7, 8,	9, 10
Size of Boiler.....horse power	2 to 6	8 to 12	15 to 20	25 to 30

REPAIR PARTS

Size Number	1	2	3	4	5	6	7	8	9	10
R—Jet Pump.....each	\$0.25	\$0.35	\$0.45	\$0.55	\$0.60	\$0.80	\$1.00	\$1.25	\$1.50	\$2.00
Y—Delivery Jet.....each	.80	1.00	1.25	1.50	1.75	2.50	4.00	6.00	8.00	10.00
V—Tail Pipe Brass, each	.25	.30	.40	.50	.50	.60	.80	1.00	1.00	1.25
X—Coupling Nut Brass each	.25	.30	.40	.50	.50	.60	1.25	1.50	1.50	2.00
Strainer	.45	.50	.55	.60	.75	1.00	1.50	.....	.....	.....

SPECIAL ACID RESISTING EJECTORS

While the composition used in the regular stock "XL-96" Ejector is very efficient against the milder solutions containing acids, this ejector is made of special anti-acid compositions, which will resist the action of acids as far as it is possible for metal to resist it. Prices on application.

THE EUREKA SYPHON



FIG. 900

The Eureka Syphon is designed for lifting and transporting liquids of all kinds, either hot or cold.

It is compact in form, convenient to handle, has no movable parts and cannot get out of order. It is lighter in weight, uses less steam and has a greater capacity than any other syphon known.

The Eureka is well adapted for marine work of all kinds, and on account of its light weight and great capacity, is particularly suitable for pumping coal boats, barges, flats and other similar work.

In fact, the Eureka is the Standard Coal Boat Syphon, and as such is known from Pittsburgh to New Orleans.

The Eureka is also specially adapted for use by railroads, oil producers, contractors, tanneries, breweries, mines, mills, and in all places where large quantities of liquids are to be moved quickly and cheaply.

The $\frac{3}{4}$ ", 1", $1\frac{1}{4}$ ", $1\frac{1}{2}$ " and 2" Syphons are recommended for pumping out cellars, basins, tanks, etc., with water pressure.

Sizes Inches	Capacity Gallons Per Hour	Pipe Connections			Steam Pressure Pounds	Prices	
		Steam Inches	Suction Inches	Delivery Inches		Iron	Brass
$\frac{3}{4}$	650	$\frac{3}{8}$	$\frac{3}{4}$	$\frac{3}{4}$	30	\$ 3.50	\$ 5.00
1	1,000	$\frac{1}{2}$	1	1	30	5.00	8.00
$1\frac{1}{4}$	1,800	$\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	30	6.50	10.00
$1\frac{1}{2}$	2,250	$\frac{3}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$	30	8.00	12.00
2	4,000	1	2	2	30	10.00	16.00
$2\frac{1}{2}$	6,250	$1\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{1}{2}$	30	11.00	20.00
3	8,900	$1\frac{1}{2}$	3	3	35	12.00	24.00
4	16,000	$1\frac{1}{2}$	4	4	35	16.00	30.00
5	25,000	$1\frac{1}{2}$	5	5	40	22.00	45.00
6	36,000	$1\frac{1}{2}$	6	6	70	30.00	60.00

All Syphons threaded for iron pipe.



Suction FIG. 901

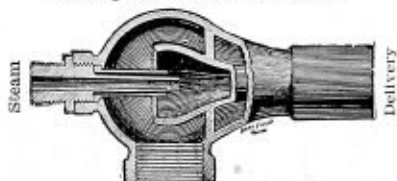
is carefully tested and stamped before it is put in stock, and are all warranted to elevate water 75 feet with 50 lbs. steam pressure, and by using two, one above the other, water can be elevated over 100 feet. This pump is especially adapted for use in mines and deep wells and in any place where it is desired to elevate water or other liquids to a great height. It is unexcelled for convenience and economy in raising liquids to high elevations. For lower elevations we recommend Coll's Patent Ejector, shown below.

COLL'S PATENT "DEFIANCE" PUMP

The Defiance Pump being Double Acting, requires but half the steam used by any other jet pump, and is consequently far more economical. They are made of the best quality of brass and best workmanship, and each one

Sizes	Prices	Size of Pipe Connections			Capacity Per Hour— 50 Lbs. Steam
		Steam	Suction	Delivery	
$\frac{3}{4}$ inch	12.00	$\frac{3}{8}$	$\frac{3}{4}$	$\frac{3}{4}$	288 gallons
1 "	16.00	$\frac{1}{2}$	1	1	350 "
$1\frac{1}{4}$ "	25.00	$\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	850 "
$1\frac{1}{2}$ "	35.00	1	$1\frac{1}{2}$	$1\frac{1}{2}$	1400 "
2 "	50.00	$1\frac{1}{4}$	2	2	2300 "
$2\frac{1}{2}$ "	65.00	$1\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	2800 "
3 "	85.00	$1\frac{3}{4}$	3	3	3500 "
4 "	100.00	$1\frac{1}{2}$	4	4	6000 "
5 "	150.00	$1\frac{1}{2}$	5	5	13000 "
6 "	200.00	$1\frac{1}{2}$	6	6	16000 "

Guaranteed elevation seventy-five feet.
Above prices include strainers.



Suction FIG. 902

COLL'S PATENT EJECTOR

Is one of the most efficient and best known ejectors or steam jet pumps made. It is especially adapted for use on steamboats, steamships and locomotives, and is also extensively used in mills, mines, factories, tanneries, breweries, and by contractors, and for moving large quantities of liquids quickly

and conveniently and with small expense of steam as compared with other ejectors of less capacity. Sizes from $\frac{3}{4}$ " to 2" are made with iron bodies and brass nozzles; $2\frac{1}{2}$ " and larger, all iron. When wanted for handling acids, we make them of a metal suitable for the purpose. We also make them to be operated by water pressure.

Sizes	Prices	Size of Pipe Connections			Capacity Per Hour— 40 Lbs. Steam	Highest Elevation	Price, Cast Iron Strainers
		Steam	Suction	Delivery			
$\frac{3}{4}$ in.	8.00	$\frac{3}{8}$	$\frac{3}{4}$	$\frac{3}{4}$	650 gals.	35 feet	1.00
1 "	10.00	$\frac{1}{2}$	1	1	890 "	35 "	1.00
$1\frac{1}{4}$ "	15.00	1	$1\frac{1}{4}$	$1\frac{1}{4}$	1250 "	35 "	1.00
$1\frac{1}{2}$ "	20.00	1	$1\frac{1}{2}$	$1\frac{1}{2}$	1960 "	35 "	1.50
2 "	24.00	$1\frac{1}{4}$	2	2	3200 "	35 "	1.50
$2\frac{1}{2}$ "	28.00	$1\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	5125 "	35 "	2.00
3 "	32.00	$1\frac{1}{2}$	3	3	8050 "	35 "	2.50
4 "	52.00	$1\frac{1}{2}$	4	4	9800 "	35 "	4.00
5 "	72.00	2	5	5	13000 "	35 "	5.00
6 "	96.00	2	6	6	16000 "	35 "	6.00
8 "	150.00	$2\frac{1}{2}$	8	8	40000 "	35 "	10.00

52" line 50-10

H-D EJECTOR

MODEL C



FIG. 903

Size Number	Price	PIPE CONNECTIONS		Capacity per Hour with 50 Lbs. Steam Pressure
		Steam, Inches	Suction and Delivery, Inches	
No. 1 Bronze	\$8.00	$\frac{3}{8}$	$\frac{1}{2}$	250 gals.
No. 2 Bronze	10.00	$\frac{1}{2}$	$\frac{3}{4}$	500 gals.
No. 3 Bronze	15.00	$\frac{3}{4}$	1	960 gals.
No. 4 Bronze	20.00	1	$1\frac{1}{4}$	1,300 gals.
No. 5 Bronze	25.00	$1\frac{1}{4}$	$1\frac{1}{2}$	2,000 gals.
No. 6 Iron	35.00	$1\frac{1}{4}$	2	4,000 gals.
No. 7 Iron	45.00	$1\frac{1}{2}$	$2\frac{1}{2}$	8,000 gals.
No. 8 Iron	55.00	2	3	11,000 gals.
No. 9 Iron	70.00	$2\frac{1}{2}$	4	15,000 gals.
No. 10 Iron	175.00	4	6	45,000 gals.

OPERATION

Open the valve in the steam pipe. As the ejector will discharge the greatest quantity of water with about 50 pounds steam pressure, it is desirable when high pressures are used to throttle the steam valve so as to reduce the steam pressure at the ejector.

The capacities given in the above list are when lifting 4 feet and elevating 4 feet—water cold. The capacity of all ejectors is decreased when the lift or the temperature of feed water is increased.

PRICE LIST—REPAIR PARTS

Size No. of Ejector.....	1	2	3	4	5	6	7	8	9	10
A Steam Nozzle.....	\$0.50	0.80	1.15	1.60	2.00	3.00	4.00	5.00	7.00	30.00
B Delivery Tube	1.00	1.45	2.35	3.75	4.30	7.60	11.00	5.00	20.00	75.00
C Tail Pipe, Steam End...	.70	.90	1.30	2.00	2.90	2.90	4.00	5.75	{ 8.00	
									{ *6.00	
D Coupling Nut, Steam End	1.00	1.30	2.00	2.60	4.00	4.00	5.30	7.50	{ 11.00	
									{ *7.00	
E Tail Pipe, Delivery End..	.90	1.30	2.00	2.90	4.00	5.75	{ *6.00	{ *7.00	{ 12.00	
									{ 8.00	
F Coupling Nut, Deliv. End.	1.30	2.00	2.60	4.00	5.30	7.50	{ *7.00	{ *8.00	{ 16.00	
									{ *10.00	

*Refers to parts being iron; all other parts are bronze.

H-D EJECTOR MODEL P



FIG. 904

Size Number	Price	PIPE CONNECTIONS		Capacity per Hour with 50 Pounds Steam Pressure Gals.
		Steam Inch.	Suction and Delivery Inch.	
No. 1 Bronze	\$ 8.00	$\frac{3}{8}$	$\frac{1}{2}$	250
No. 2 Bronze	10.00	$\frac{1}{2}$	$\frac{3}{4}$	500
No. 3 Bronze	15.00	$\frac{3}{4}$	1	960
No. 4 Bronze	20.00	1	$1\frac{1}{4}$	1,300
No. 5 Bronze	25.00	$1\frac{1}{4}$	$1\frac{1}{2}$	2,000
No. 6 Iron	35.00	$1\frac{1}{2}$	2	4,000
No. 7 Iron	45.00	$1\frac{1}{2}$	$2\frac{1}{2}$	8,000
No. 8 Iron	55.00	2	3	11,000
No. 9 Iron	70.00	$2\frac{1}{2}$	4	15,000

The H-D Ejector, Model P, is the same in general details of construction as the Model C, except for the delivery connection which, in Model P, is furnished without a coupling. This connection is female and in the body of the ejector. Sizes Nos. 6, 7 and 8 have iron body, balance bronze. Size No. 9 has bronze tubes, balance iron. Sizes Nos. 6, 7, 8 and 9 made entirely of bronze, on special order. Prices on application. Special all-iron ejectors made to order. Prices on application. Operation is the same as the H-D Ejector, Model C.



FIG. 905

H-D DRIVE WELL EJECTOR MODEL R FOR ARTESIAN OR DRIVE WELLS

Size Number	Price	Steam Pipe Inside Casing, Inches	Steam Pipe Outside Casing, Inches	Suction and Delivery, Inches	Steam Pipe Casing, Inches	Minimum Diameter of Well, Inches	Capacity with 75 Lbs. Steam Pressure Lifting 1 Ft. Elevating 25 Ft.
2	\$15.00	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{3}{4}$	3	400
3	20.00	$\frac{1}{2}$	$\frac{3}{4}$	1	1	4	800
4	30.00	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{4}$	$4\frac{1}{2}$	1,200
5	40.00	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$	5	1,800

All sizes made entirely of bronze.

REPAIR PARTS

Size No. of Ejector	2	3	4	5
Steam Nozzle	\$0.80	1.15	1.60	2.00
Delivery Tube	1.45	2.35	3.75	4.30

BLAKESLEE JET AND BILGE PUMPS

Model A



FIG. 906

Model B



FIG. 907

Deep Well



FIG. 908

Bilge



FIG. 909

MODELS A AND B JET PUMPS

Size of pump.....inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4
Suction pipe.....inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4
Discharge pipe Model A.....inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Discharge pipe Model B.....inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	$2\frac{1}{2}$	3
Steam pipe.....inches	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	1	1	2
Size boiler required.....	2	3	4	6	8	10	15	..
Capacity per minute.....gals.	8	15	20	30	40	50	60	250
Price, Models A or B.....each	\$8.00	10.00	12.00	14.00	16.00	20.00	24.00	70.00
Price, brass strainers.....each	.60	.75	1.00	1.70	2.20	2.35	2.50	....

The 4-inch pump is furnished with flange connections on discharge end. The sizes of pipes given in these lists are for short length only (say 50 feet) sizes should be increased as length increases. The capacities given above are when lifting 4 feet and elevating 4 feet. The capacity of a Jet Pump is decreased when the lift or elevation is increased. The temperature of the liquid pumped also affects the capacity.

DEEP WELL JET PUMP

Size of Pump Inches	Suction and Delivery Inches	Steam Pipe Inches	Steam Pipe Casing Inches	Capacity Per Min.	Minimum Diameter of Well	Weight Pounds	Price Each
1	1	$\frac{1}{2}$	1	15	4	10	\$20.00
$1\frac{1}{4}$	$1\frac{1}{4}$	$\frac{1}{2}$	1	20	$4\frac{1}{2}$	12	30.00
$1\frac{1}{2}$	$1\frac{1}{2}$	$\frac{3}{4}$	$1\frac{1}{4}$	30	5	16	40.00
2	2	$\frac{3}{4}$	$1\frac{1}{4}$	40	6	16	50.00

Brass strainers for above listed above.

Capacity of pump must not be larger than flow of well. Full instructions sent with each pump.

BILGE PUMPS

These pumps are adapted to raise a large amount of water with but little steam, but not to very great heights.

Size of Pump Inches	Suction Pipe Inches	Discharge Pipe, Inches	Steam Pipe Inches	Capacity Per Hour with Fifty Pounds Steam, Gals.	Weight Pounds	Price
$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{4}$	$\frac{3}{4}$	2400	10	\$10.00
2	2	$1\frac{1}{2}$	1	3000	12	14.00
3	3	$2\frac{1}{2}$	1	3600	18	16.00
4	4	3	$1\frac{1}{4}$	4500	30	20.00
6	6	4	$1\frac{1}{2}$	8000	40	30.00

DIRECTIONS—Connecting steam pipe to boiler, with globe valve in a convenient place, run it to suitable place for pump; screw pump to steam pipe by a common thimble; afterwards attach suction and discharge pipe, and the pump is ready for use.



Fig. 910

STRAINERS

FOR INJECTORS AND EJECTORS

PRICE LIST—HOSE STRAINERS

Size of Hose.....inches	$\frac{3}{8}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$
Price, All Brass.....	\$0.50	.55	.60	.75
Malleable Iron with Brass Strainer.	.40	.45	.50	.60

The shank on the 1-inch strainer is tapered and can be used on 1 $\frac{1}{4}$ -inch hose.

PRICE LIST—PIPE STRAINERS

Size Pipe inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3
Price, All Brass	\$0.40	.40	.45	.50	.55	.60	.75	1.00	1.50

Pipe Connection



Fig. 911

FUSIBLE PLUGS

REGULAR LENGTH
No. 750, for Outside Insertion
No. 751, for Inside Insertion



FIG. 912

EXTRA LONG
No. 752, For Outside Insertion



FIG. 913

EXTRA LONG
No. 753, for Inside Insertion



FIG. 914

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2
No. 750 and No. 751.....each		\$0.60	.75	1.00	1.50	2.00	3.00
No. 752 and No. 753.....each		1.20	1.50	2.00	3.00	4.00	6.00

Our Fusible Plugs are filled with BANCA TIN.

RECOMMENDATIONS

Nos. 750 and 751 for ordinary service.

Nos. 752 and 753 to comply with the latest rules issued by the Steamboat Inspection Service of the United States Government.

Nos. 752 and 753 to comply with the various State and City Laws requiring Fusible Plugs with extensions.

Plugs should be installed in direct passage of the fire or gases with small end of the Banca Tin exposed to the fire or gases. These Plugs are NOT to be used inside a steam drum, etc., where the temperature of the steam is used as a fusing agent.

ORDERING

In ordering, always give style, number and size.

When not otherwise specified, the outside type will be furnished as follows:

No. 750—For ordinary service.

No. 752—For the Steamboat Inspection Service of the United States Government and for some State and City Laws.

IMPROVED HYDRAULIC RAM **FOR THE SUPPLY OF DWELLINGS, FACTORIES, VILLAGES, RAILROAD** **STATIONS, STOCK YARDS, ETC., WITH RUNNING WATER**

**FIG. 915**

The illustration shows our Improved Hydraulic Ram for elevating water. Locate the ram in any convenient position, not less than 12 feet from the fountain, spring or reservoir: the flow of water to the ram, even from a low head, will force a small quantity to any height you may require.

The simple and effective operation of this machine, its great durability and the small number of working parts, render it the most useful and valuable apparatus yet developed for elevating a moderate quantity of water to any desired point.

The table below gives the height to which water can be successfully raised with various amounts of fall from reservoir to ram, also the proportion of the supply water which will be raised. If the distance water is to be raised is less than the maximum shown the quantity raised will be greater in proportion to the supply. Make the vertical distance from the supply to the ram as great as possible.

Always bear in mind that the length and size of discharge pipe will affect the discharge. Make it as short and straight as practicable; avoid all bends in the feed pipe and where they are absolutely unavoidable, bend the pipe. Don't use elbows.

If interested in these rams, write us for special catalogue and for data sheet to fill out giving us such information as will enable us to advise you the proper plant to install.

When possible submit sketch showing location of water supply, giving amount of fall and distance to be forced from ram, both horizontally and vertically.

These machines are made of iron and bronze. The valve stem and case are made of the latter material, which has more durable and lasting qualities than any other composition. For very heavy pressures we make our large sizes of rams extra heavy, using heavy brass ball valves, etc., prices of which will be furnished upon application.

TABLE SHOWING EFFICIENCY OF THE HYDRAULIC RAM

Minimum Fall of Water, in feet, under which Ram will effectively elevate water to height given below.....	2	2	2	3	4	5	6	7	8	10	12
Height in feet the water may be elevated.....	4	6	8	15	24	35	48	63	80	100	120
Length of Drive Pipe in feet....	12	12	12	15	20	30	40	50	60	75	95
Number of times the height or elevation of discharge is greater than the fall.....	2	3	4	5	6	7	8	9	10	10	10
Proportion of water elevated or discharged by the Ram.....	$\frac{2}{7}$	$\frac{1}{5}$	$\frac{1}{4}$	$\frac{2}{17}$	$\frac{1}{10}$	$\frac{1}{12}$	$\frac{1}{14}$	$\frac{2}{31}$	$\frac{1}{17}$	$\frac{1}{18}$	$\frac{1}{20}$
Proportion of water wasted at the Impetus Valve by the Ram.....	$\frac{5}{7}$	$\frac{4}{5}$	$\frac{3}{4}$	$\frac{15}{17}$	$\frac{9}{10}$	$\frac{11}{12}$	$\frac{13}{14}$	$\frac{29}{31}$	$\frac{16}{17}$	$\frac{17}{18}$	$\frac{19}{20}$
Per cent. of useful effect of power expended.....	80	78	75	72	68	62	57	53	48	42	38

SIZES AND LISTS OF OUR IMPROVED HYDRAULIC RAM

No.	Quantity of water furnish by the Reservoir to which the Ram is adapted	Length the Drive Pipe Should be, Feet	Calibre of Pipe, Inches		Price
			Drive	Discharge	
2	$\frac{1}{8}$ to 2 gallons per minute	12 to 50	$\frac{3}{4}$	$\frac{1}{2}$	\$9.75
3	$\frac{1}{2}$ " 4 " " "	12 " 50	1	$\frac{1}{2}$	12.00
4	3 " 4 " " "	12 " 50	$1\frac{1}{2}$	$\frac{3}{4}$	15.00
5	6 " 14 " " "	25 " 100	2	1	24.00
6	12 " 25 " " "	25 " 100	$2\frac{1}{2}$	$1\frac{1}{4}$	43.25
7	20 " 60 " " "	25 " 125	4	2	81.00
8	30 " 120 " " "	25 " 150	6	$2\frac{1}{2}$	135.00

RIFE HYDRAULIC RAM



FIG. 916

For the water supply of towns, villages, mansions, estates, cottages, farm houses, railroad tanks, irrigation.

A Rife Ram can be employed wherever three or more gallons per minute are available with a fall of 3 feet or more. It will raise the water thirty times as high as the fall. However, it is always advisable to locate the ram under the greatest fall possible within a reasonable distance, thus insuring the greatest amount being delivered. For instance, twice as much water would be delivered 100 feet high as 200 feet high—using the same fall or power head. Again, twice as much water would be delivered with 10 feet fall as with 5 feet fall—provided the delivery is the same. The fraction of the supply water which can be raised depends upon the difference of the power head to the delivery head. If the ram were a perfect machine, the supply in gallons per minute multiplied by the power head would be equal to the delivery in gallons per minute multiplied by the delivery head. There are naturally losses, due to friction, etc., but as a matter of fact, Rife Rams, when properly installed, show efficiencies very near to 97 per cent.

Number	Dimensions			Size of Drive Pipe	Size of Delivery Pipe	Gallons Per Minute Required to Operate Ram	Least Number of Feet Fall Recommended	Weight	Price Single Acting	Price Double Acting
	Height	Length	Width							
10	2 ft. 2 in.	2 ft. 10 in.	12 in.	1 1/4 in.	3/4 in.	2 to 6	3	150	\$ 50.00	\$ 60.00
15	2 ft. 2 in.	3 ft.	12 in.	1 1/8 in.	3/8 in.	6 to 12	3	175	55.00	65.00
20	2 ft. 5 in.	3 ft. 3 in.	1 ft. 2 in.	2 in.	1 in.	8 to 18	3	225	60.00	70.00
25	2 ft. 5 in.	3 ft. 4 in.	1 ft. 3 in.	2 1/8 in.	1 in.	12 to 28	3	250	66.00	76.00
30	2 ft. 7 in.	3 ft. 7 in.	1 ft. 3 in.	3 in.	1 1/4 in.	20 to 40	3	275	75.00	85.00
40	3 ft. 7 in.	4 ft. 9 in.	1 ft. 8 in.	4 in.	2 in.	30 to 75	4	600	150.00	165.00
60	4 ft. 8 in.	6 ft.	2 ft. 3 in.	6 in.	3 in.	75 to 150	5	1200	300.00	330.00
80	6 ft. 4 in.	7 ft.	3 ft.	8 in.	4 in.	150 to 300	5	2200	550.00	600.00
120	8 ft. 9 in.	8 ft. 4 in.	2 ft. 8 in.	12 in.	5 in.	375 to 700	6	3000	1000.00	1150.00

THE RELIANCE SAFETY WATER COLUMN

Combined High and Low Water Alarm



FIG. 917

Combined High and Low Water Alarm, with Wooden Wheel Trimmings



FIG. 918

Reliance Water Columns with Reliance Trimmings

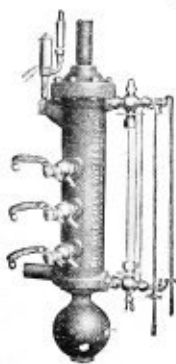


FIG. 918A

Low Water Alarm



FIG. 919

COMBINED HIGH AND LOW WATER ALARMS

GENERAL DIMENSIONS

Size of Column, Number	Kind and Size of Boiler, Inches	Variation Betw. Alarms, Inches	List Price of Columns	List Price of Wood Wheel Water Gage and Gage Cocks	Steam and Water Connections, Inches	Blow-off, Inches	Water Gage, Inches	Gage Glasses, Inches	Gage Cocks, Centers, Inches	Gage Cocks Size, Inches	Center of Water Connection to Top of Column, Inches	Diameter of Column, Inches	Length Over All, Inches
1	36 to 54	6	\$28.00	7.00	1	1 1/2	1 1/2 x 14	3/8 x 12	3	1 1/2	16	3 3/4	23 1/4
1 1/2	36 to 54	6	28.00	7.00	1 1/4	3/4	1 1/2 x 14	3/8 x 12	3	1 1/2	19 3/4	5	28 1/4
5	54 to 72	8	30.00	10.00	1 1/4	3/4	3/4 x 18	3/8 x 16	4	3/4	20 1/2	4 1/4	29 1/2
7	Vertical	12	35.00	10.00	1 1/2	3/4	3/4 x 21	3/8 x 19	6	3/4	26	5 1/4	36
9	Vertical	18	40.00	10.00	1 1/2	1	3/4 x 28	3/8 x 26	9	3/4	33 1/2	5 1/4	44
11	Vertical	24	42.50	12.50	1 1/2	1	3/4 x 32	3/8 x 30	12	3/4	37 3/4	5	48

LOW WATER ALARMS

GENERAL DIMENSIONS

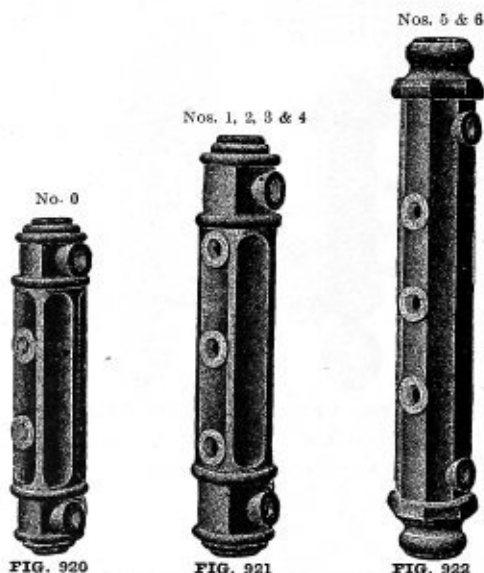
2	36 to 54	....	\$25.00	7.00	1	1 1/2	1 1/2 x 14	3/8 x 12	3	1 1/2	16	3 3/4	23 1/4
6	54 to 72	....	28.00	10.00	1 1/4	3/4	3/4 x 16	3/8 x 14	4	3/4	18 1/4	4 1/4	27 1/4
8	Vertical	....	35.00	10.00	1 1/2	3/4	3/4 x 21	3/8 x 19	6	3/4	26	5 1/4	36

Also columns for all the leading Boiler Manufacturers' special type boilers.

While any kind of water gage and gage cocks may be used, the Reliance quick closing water gage cock and the Reliance lever chain gage cock are made especially for Reliance Water Columns. We recommend their use.

Reliance Safety Alarm Water Columns are sure to warn long before the water reaches the alarm level. There is no failure in their operation. The valves are placed high above the high water mark and constructed so they will not become stopped. Reliance Floats possess unusual strength and durability. Be sure to use Reliance parts with Reliance Columns.

COMMON WATER COLUMNS



Number.....	00	0	1	2	3	4	5	6
Center to center, boiler connections.....inches.....			10	12½	14	18		
Center to center, water gauge connections.....inches.....	13	9½	10	12½	14	18	13¾	17¼
Center to center, gauge cocks.....inches.....			8¾	3¾	4¾	4	3⅝	4½
Extreme length..... ".....	17⅝	13¼	13⅝	16½	19	22⅝	20¼	30¼
Tapped for boiler connections.....inches.....		½	½	¾	1¼	1¼		
Tapped for water gauge connections.....inches.....	½	⅝	½	¾	¾	¾	1½	¾
Tapped for gauge cocks.....in.....			¾	1½	1½	¾	1½	¾
" top and bottom..... ".....	1¼	¾x¾	¾	1	¾	1¼	1¼	1¼
Price.....each	\$3.00	1.50	2.75	4.00	6.00	8.00	7.50	12.00

Nos. 0 and 00 are designed especially for house heating boilers. No holes for gauge cocks.

With Nos. 00, 5 and 6 the connection to boiler is made from top and bottom of column.

No. 3 water column can also be supplied tapped ½-inch and 1¼-inch for boiler connection.

THE "PITTSBURGH" SEAMLESS COPPER FLOATS

For all high pressure purposes. No bands. No seams. Made of one piece of copper. No place to leak.

Tested to 300 pounds hydraulic pressure and guaranteed for one year.

High Pressure Floats



FIG. 923

Size	List Price Per Doz.	Size	List Price Per Doz.
4-inch.....	\$23.00	10-inch.....	\$105.00
5 ".....	27.00	11 ".....	128.00
6 ".....	34.00	12 ".....	168.00
7 ".....	49.00	15 ".....	342.00
8 ".....	64.00	16 ".....	375.00
9 ".....	79.00	20 ".....	420.00

We can furnish on short notice Floats of any size, weight or shape to stand any pressure.

THE "PITTSBURGH" OPEN TANK SEAMLESS COPPER FLOATS

Made in one piece—no bands or seams. Suitable for open tanks, closets and all places where little or no pressure is used.

Open Tank Floats

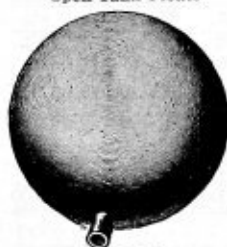


FIG. 924

Diameter	List Price Per Doz.	Diameter	List Price Per Doz.
2-inch.....	\$4.00	7-inch.....	\$17.00
3 ".....	5.25	8 ".....	27.00
4 ".....	6.25	9 ".....	37.00
5 ".....	7.25	10 ".....	47.00
6 ".....	8.25	12 ".....	60.00

Nickel Floats 10 per cent additional.

STEAM TRAP SEAMLESS COPPER BALL FLOATS

In Steam Traps, Governors, etc., or where a float for pressure is desired, no solder or joints exposed, nothing but pure copper to come in contact with steam or water.

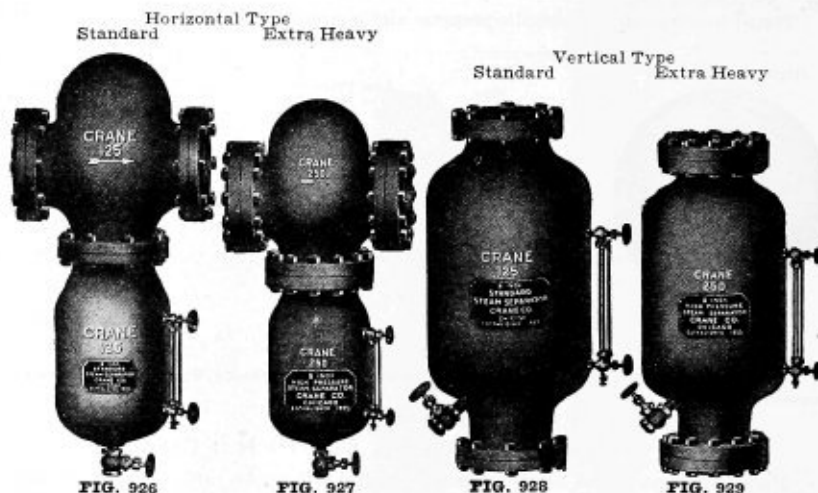
Made any design or for any desired pressure. Prices submitted upon receipt of specifications and quantities wanted.



FIG. 925

STEAM SEPARATORS

STANDARD TYPE—FOR STEAM PRESSURES UP TO 125 POUNDS
 EXTRA HEAVY TYPE—FOR STEAM PRESSURES UP TO 250 POUNDS



STANDARD HORIZONTAL AND VERTICAL TYPES

Size	inches	1½	2	2½	3	3½	4	4½
Horizontal, Face to Face.....	inches	10	10	11	12	14	14	16
Vertical, Face to Face.....	inches	27	27	27	29	31	31	33
Price, either style.....	each	\$24.00	28.00	34.00	42.00	50.00	58.00	68.00

Size	inches	5	6	7	8	9	10	12
Horizontal, Face to Face.....	inches	16	17	20	20	23	23	26
Vertical, Face to Face.....	inches	33	38	41	41	44	44	47
Price, either style.....	each	\$76.00	98.00	116.00	134.00	152.00	170.00	200.00

EXTRA HEAVY HORIZONTAL AND VERTICAL TYPES

Size	inches	1½	2	2½	3	3½	4	4½
Horizontal, Face to Face.....	inches	10	10	11	12	14	14	16
Vertical, Face to Face.....	inches	27	27	27	29	31	31	33
Price, either style.....	each	\$26.50	31.00	37.50	46.00	55.00	64.00	75.00

Size	inches	5	6	7	8	9	10	12
Horizontal, Face to Face.....	inches	16	17	20	20	23	23	26
Vertical, Face to Face.....	inches	33	38	41	41	44	44	47
Price, either style.....	each	\$84.00	108.00	128.00	147.00	187.00	187.00	220.00

The above prices include water gauge, drain valve and nipple; also companion flanges and bolts, but no gaskets.

OIL SEPARATORS

FOR THE ELIMINATION OF OIL AND WATER FROM EXHAUST STEAM
FOR STEAM WORKING PRESSURES UP TO 25 POUNDS

Horizontal Type
Sizes 1½ to 10 in.

Sizes 12 to 36 in.

Vertical Type
Sizes 1½ to 12 in.



FIG. 930



FIG. 931



FIG. 932

HORIZONTAL OR VERTICAL TYPES

Size	inches	1½	2	2½	3	3½	4	4½	5
Face to Face, Hor..	inches	10	10	11	12	14	14	16	16
Face to Face, Vert..	inches	27	27	27	29	31	31	33	33
Price	each	\$24.00	28.00	34.00	42.00	50.00	58.00	68.00	76.00

Size	inches	6	7	8	9	10	12	14	15
Face to Face, Hor..	inches	17	20	20	23	23	20	23	25
Face to Face, Vert..	inches	38	41	41	44	44	47		
Price	each	\$98.00	116.00	134.00	152.00	170.00	200.00	250.00	300.00

Size	inches	16	18	20	22	24	26	28	30	36
Face to Face, inches		25	27	30	32	34	36	40	40	46
Price	each	\$325.00	450.00	550.00	700.00	850.00	1000.00	1300.00	1600.00	2250.00

The above prices include water gauge, drain valve and nipple; also the drilling of flanges for all sizes including companion flanges and bolts, but no gaskets for sizes up to and including 12-inch, but do not include companion flanges, bolts or gaskets for sizes 14-inch and larger.

The flange on bottom of horizontal type 12-inch and larger may be removed and the baffle plate examined and thoroughly cleaned by hand, if necessary.

EXTRA HEAVY RECEIVER STEAM SEPARATORS
FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

Horizontal Type



No. 014
FIG. 933

Vertical Type

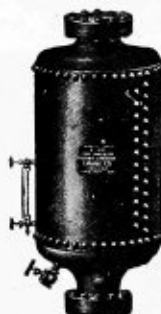


FIG. 934

HORIZONTAL TYPE

Sizes, 4 inches to 20 inches, inclusive.

VERTICAL TYPE

Sizes, 4 inches to 20 inches, inclusive.

Riveted steel plate shell with Ferrosteeel or steel plate head.

Can be constructed so that steam may enter at top, bottom or side.

Inquiries should state direction of flow.

Prices quoted upon application.

We can also furnish these Receiver Steam Separators to order, with cast steel separating and receiver heads or steel plate head and steel plate shell, suitable for superheated steam working pressures up to 350 pounds and a total temperature of 800 degrees Fahrenheit.

Prices upon application.

AUSTIN CAST IRON STEAM SEPARATORS

STANDARD PATTERNS

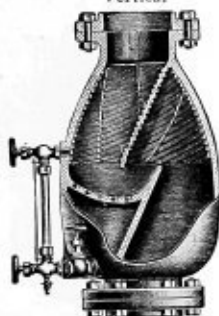
Fig. "A"
Vertical

FIG. 935

Fig. "B"
Horizontal

FIG. 936

They separate the moisture and "slugs" of water from live steam, insuring a higher efficiency in the engine with a minimum fuel and lubricant expense together with insurance against cylinder explosions.

FIG. "A"

The Fig. "A" is, without question, one of the most perfect eliminators ever devised for taking water out of live steam. When installed above the throttle of an engine, with a good steam trap of ample size to fully drain the receiving chamber, it furnishes steam that is better than 99 per cent. dry, and in some tests as high as 99.6 has been attained. Since first introduced, there has been no material modification in the design of this machine, which in itself proves the correctness of the principles upon which it is constructed.

FIG. "B"

The principle upon which the Austin Fig. "B" is designed is known as an undershot construction. By this is meant that the steam, after being impinged against a baffle plate, passes around under the baffle plate to the outlet. The main feature contributing to the successful operation of this form of separator is that the baffle plate is not set at right angles to the entering steam current, but is set at an angle so that when the steam is impinged against it the particles of water rebound at an opposite angle. This sets up a rotating motion in the steam, bringing the latter in contact with the inside walls of the separator. These walls are heavily corrugated, as is also the surface of the baffle plate, and all corrugations are designed so as to carry the drainage out of and away from the course of the steam. Additional baffles in the well or receiver of the separator serve to separate any oil or water not caught by the upper baffles and further to prevent the steam current from picking up the oil or water in the receiver as it passes.

Size	inches	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2
Price	each	\$30.00	40.00	45.00	50.00	60.00	70.00	75.00
Diameter of Flanges	inches	Screwed	Screwed	7	7 1/2	8 1/2	9	9 1/2
Face to Face, Fig. A, Vertical ..	"	11	11	13	15 1/2	16 1/2	18	20
Face to Face, Fig. B, Horizon. ..	"	9	9	13 1/4	15 1/4	16	18 1/4	19 1/4
Size	inches	5	6	7	8	10	12	14
Price	each	\$80.00	110.00	125.00	160.00	220.00	250.00	300.00
Diameter of Flanges	inches	10	11	12 1/2	13 1/2	16	19	21
Face to Face, Fig. A, Vertical ..	"	22 1/2	25 1/2	28 1/2	31 1/2	37	40 1/4	44
Face to Face, Fig. B, Horizon. ..	"	20 1/2	24 1/2	27 1/2	30 1/2	36	39	43

*Fig. "A" not made in 14-inch size.

Companion Flanges, Gaskets, Bolts, Drain Valve and Nipple not included in above prices.

AUSTIN RECEIVER SEPARATORS

HORIZONTAL

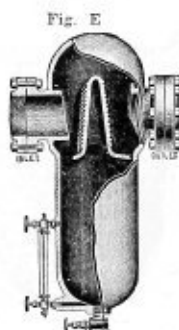


FIG. 937



FIG. 938

FIG. E

A strong combination of the best features contained in our other patterns is embodied in the construction of the Fig. E separator. It has the angle baffle plate and specially extended inlet, designed to force the steam, after striking the baffle, to take an angle that causes it to be thrown from baffle to inner shell, and vice versa, imparting a perfect centrifugal motion.

Then, also, the general construction of this separator commends itself to engineers having practical knowledge of the subject. An overshot baffle plate affords the most easy and natural course possible for the steam, air or gas, fulfilling the natural law that such currents ascend and that the separated particles, whether water, oil or grit, fall by gravity.

FIG. L

This represents the highest form of horizontal receiver separator obtainable for large steam users, a separator perfect in efficiency, of immense receiver capacity, and adapted for the highest working pressure.

Engines protected by this separator may be operated with slight clearance with entire safety. Dry steam of great expansiveness and elasticity is obtained, thereby assuring a maximum of engine power. In every way the utmost economy which can result from the use of a combined separator and steam accumulator may be obtained with this machine. Upon request we will be pleased to refer to a large number of important plants in various parts of the country, in which this type of separator has been installed with excellent satisfaction in results.

Size inches	2	2½	3	3½	4	4½	5	6
Diameter of Flanges, inches	8rd.	7½	8¾	9	10	10½	11	12½
Face to Face, Fig. E, inches	9	11	12¼	13¾	14¾	16¼	19	21
Face to Face, Fig. L, inches	.	.	12¾	...	24¾	...	19	21
Size inches	7	8	10	12	14	16	18	20
Diameter of Flanges, inches	14	15	17½	20½	23	25½	28	30½
Face to Face, Fig. E, inches	22¾	24	30	34	39¾	44	48	54
Face to Face, Fig. L, inches	22¾	24	30	34	39	41½	43	45

Fig. E not made larger than 14-inch. Fig. L not made smaller than 3-inch, nor in the 4½-inch size.

Prices on application.

CAST IRON DRIP POCKETS FOR STEAM MAINS

STANDARD: FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

EXTRA HEAVY: FOR STEAM WORKING PRESSURES UP TO 250 POUNDS

For Vertical Pipe



FIG. 939

For Horizontal Pipe



FIG. 940

For Horizontal and Vertical Pipe



FIG. 941

Size, Ins.	Price List				Dimensions	
	Standard		Extra Heavy		A Height of Drip Pocket, Inches	Size of Drain Connection Inches
	With Faced Flanges, Each	With Faced and Drilled Flanges, Each	With Faced Flanges, Each	With Faced and Drilled Flanges, Each		
2½	\$19.00	\$20.00	\$19.00	\$20.00	13	¾
3	21.00	22.00	21.00	22.00	14	1
3½	23.00	24.00	23.00	24.00	16	1
4	24.00	26.00	24.00	26.00	16	1
4½	26.00	28.00	26.00	28.00	18	1¼
5	28.00	30.00	28.00	30.00	18	1¼
6	35.00	37.00	35.00	37.00	20	1¼
7	47.00	50.00	47.00	50.00	24¼	1½
8	52.00	55.00	52.00	55.00	24¼	1½
9	72.00	75.00	72.00	75.00	28	1½
10	77.00	80.00	77.00	80.00	28	1½
12	115.00	120.00	115.00	120.00	32	1½

Extra heavy drip pockets furnished to order of Ferrosteel at an advance of 25 per cent.

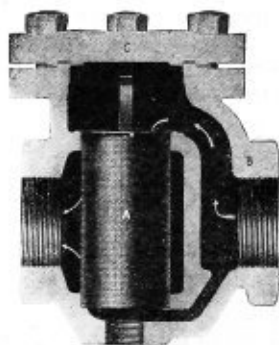
These attachments not only serve as drainage collectors, but also keep the piping clear of pipe scale, dirt and other foreign matter that would otherwise accumulate and cause trouble in new installation work.

Excepting sizes above 12 inch, we always recommend using FULL SIZE DRIP POCKETS, corresponding to the size pipe to which they are connected, thus avoiding any possibility of water being carried beyond them, as would very likely happen by using reduced openings or smaller size Pockets.

The 12 inch Drip Pocket is large enough to take care of the condensation in steam lines from 14 to 24 inch, inclusive. In using this Drip Pocket on larger sizes than 12 inch, it will be necessary to use a reducing fitting to conform to the 12x19 or 12x20½ flange on the Drip Pocket. Drip Pockets will be furnished faced only, unless otherwise ordered.

Prices do not include the flanged fittings or bolts shown in above cuts.

Drip Pockets will be tapped for water gage. Water gage will be furnished when ordered at an extra price.



BLOW OFF
FIG. 942

C. C. SELF-CLEANING STRAINERS

FERROSTEEL
FOR STEAM WORKING PRESSURES UP TO
250 POUNDS

Size, Inches	Connections		Extra Strainer Cylinders		
	Screwed, Each	Flanged, Each	Perforations		
			$\frac{1}{16}$ inch,	$\frac{3}{32}$ inch and	$\frac{1}{4}$ inch
$\frac{1}{8}$	....	....	....	....	....
$\frac{1}{4}$	....	....	....	....	....
$\frac{3}{8}$	\$2.50	....			\$0.55
$\frac{1}{2}$	2.50	....			.55
$\frac{3}{4}$	2.75	....			.55
1	3.25	....			.70
$1\frac{1}{4}$	4.50	....			.80
$1\frac{1}{2}$	5.00	....			1.00
2	8.00	\$11.75			1.20
$2\frac{1}{2}$	11.75	15.50			1.70
3	13.00	19.50			2.15
$3\frac{1}{2}$	19.50	24.50			2.75
4	23.00	28.00			3.00
$4\frac{1}{2}$	36.50	43.00			4.75
5	43.00	50.00			5.25
6	55.00	61.00			8.00
8	115.00	126.00			14.00
10	195.00	213.00			18.00
12	280.00	300.00			25.00

*These sizes made in Brass only. All others of Ferrosteel.

C. C. Self-Cleaning Strainers protect Turbines, Engines, Pumps, Steam Traps, Pressure Regulators, Pressure and Vacuum Heating Systems, Automatic Air Tools, Blasts, Meters, Burners; in short, wherever steam, air or gas is passed through pipe lines, they assure positive, continuous service.

C. C. Self-Cleaning Strainers as listed are suitable for 250 pounds steam or gas working pressure or 400 pounds liquid pressure.

Cast Steel Bodies are supplied for superheated steam and high pressure liquid service at special prices.

Unless otherwise specified C. C. Self-Cleaning Strainers are supplied with Strainer Cylinders having $\frac{1}{16}$ inch perforations and are suitable for either steam, air or gas service.

When specified for liquid service, Strainer Cylinders have $\frac{3}{32}$ inch perforations. Extra Strainer Cylinders are frequently desirable in liquid service.

Strainer Cylinders will be supplied on order with $\frac{1}{16}$, $\frac{1}{8}$, $\frac{3}{16}$ or $\frac{1}{4}$ inch perforations.

Screwed Connections are furnished unless otherwise specified.

Flange Connections: faced only; drilling extra.

SHEET METAL PRODUCTS

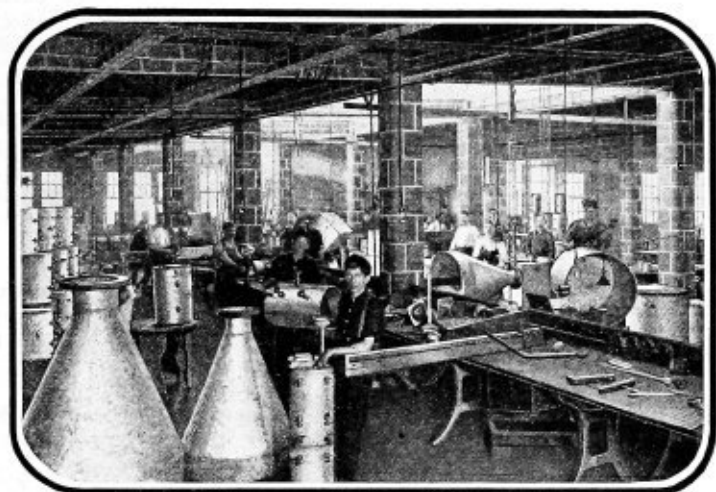


FIG. 943

A PARTIAL VIEW OF OUR SHEET METAL DEPT.

This is one of the most important departments in the manufacturing end of our business. We make a specialty of all kinds of Sheet Metal Work—either light or heavy material up to 12 gage. Our facilities for turning out this class of work are the best. Only skilled mechanics are employed and our shop is equipped with the most modern machinery.

We make Safety Guards for machinery

Waste Cans for power plants and factories

Heating and Ventilating Piping

Ash and Garbage Cans

Blast and Suction Piping

Oil Storage Tanks

Exhaust Heads

Smoke Stacks

Ventilators

Oil Filters Etc.

Send us blue print or rough sketch of materials required, and we will be glad to submit estimates promptly.

GACO VENTILATORS

"GACO" Ventilators will remove all smoke, offensive odors, poisonous and dangerous gases and keep your factory, office or shop properly ventilated twenty-four hours a day.

A man's working capacity is governed almost entirely by his physical condition. If his health is impaired by breathing foul, poisonous air over and over again, he can not turn out the quantity or the quality of work that he could if his lungs were supplied with pure fresh air at all times.

"GACO" Ventilators are made of heavy galvanized iron. They possess sufficient strength to resist every strain ordinarily encountered in the service for which they are designed.



FIG. 944

The "GACO" is so designed that there is no down draft or back flow of air, nor does the direction or velocity of wind affect its operation.

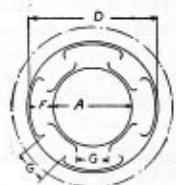
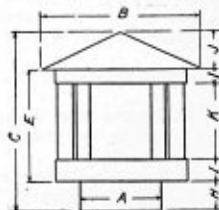
The first cost of the ventilator is moderate and will give years of good service without a cent of operating cost. They are easy to attach and can be had to fit any kind of a roof.

DIMENSIONS AND LIST PRICES

A	B	C	D	E	F	G	H&I	J	K	Price
12-in.	24	27	18	18	3	4 1/2	3	6	12	\$ 5.00
14-in.	28	31 1/2	21	21	3 1/2	5 1/4	3 1/2	7	14	7.50
16-in.	32	36	24	24	4	6	4	8	16	10.00
18-in.	36	40 1/2	27	27	4 1/2	6 3/4	4 1/2	9	18	12.50
20-in.	40	45	30	30	5	7 1/2	5	10	20	15.00
24-in.	48	54	36	36	6	9 1/2	6	12	24	18.00
30-in.	60	67 1/2	45	45	7 1/2	12	7 1/2	15	30	25.00
36-in.	72	81	54	54	9	14 1/2	9	18	36	37.50
40-in.	80	90	60	60	10	16	10	20	40	50.00
48-in.	96	108	72	72	12	19	12	24	48	60.00
54-in.	108	121 1/2	81	81	13 1/2	21	13 1/2	27	54	70.00
60-in.	120	135	90	90	15	23 1/2	15	30	60	80.00
66-in.	132	148 1/2	99	99	16 1/2	25 1/2	16 1/2	33	66	90.00
72-in.	144	162	108	108	18	28	18	36	72	100.00

Write us for quotations on other sizes.

Ventilator bases are charged extra.

SECTION WITH CONE
REMOVED SHOWING
CONSTRUCTION OF LAMINAEEXTERIOR VIEW
FIG. 945

THE "PITTSBURGH" VACUUM EXHAUST HEAD

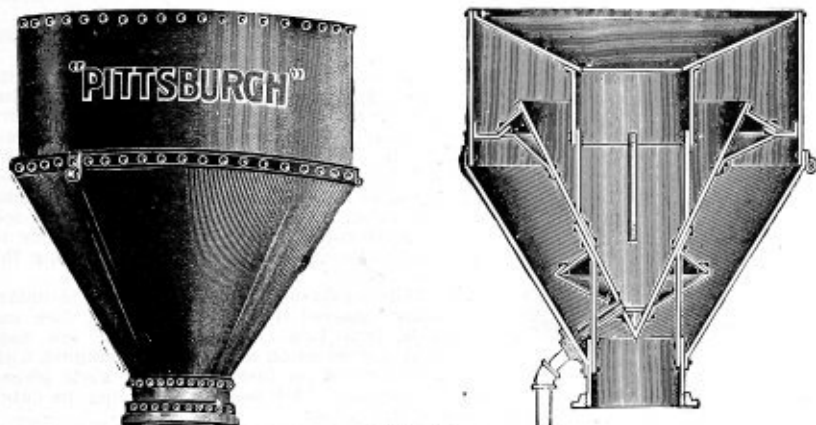


FIG. 946

Positively removes grease and water from the escaping vapor, leaving it dry and free, thereby preventing rotting of roofs and walls, spattering of pavements and buildings and accumulation of ice.

The exhaust to the air is free and noiseless, with no back pressure on the engine.

The case and pipes are of heavy galvanized iron, 14 to 20-gage, according to size; all joints are close riveted and braced, the internal pipes being doubly braced.

Sizes above 6-inch are flanged.

Size Exhaust Pipe in Inches	Height, Inches	Width Top, Inches	Diam. Drip Pipe, Inches	List Price, Each
1 or 1½	21	16	¾	\$20.00
2 or 2½	21	16	¾	25.00
3 or 3½	24	19	¾	30.00
4 or 4½	28	22	1	40.00
5	34	26	1	50.00
6	28	21½	1¼	60.00
7	32½	25	1¼	75.00
8	37	28	1¼	90.00
9	40½	33	1¼	105.00
10	45½	37¾	1½	125.00
12	53	44	1½	150.00
14	58¾	46	2	200.00
15	65	52	2	235.00
16	69½	56	2	250.00
18	72¼	61	2	300.00
20	86½	68	2	350.00
22	94	74	3	400.00
24	103	81	2½	450.00
26	111	87	2½	500.00
30	127½	100	3	600.00
36	142	120	3	750.00

THE R-K EXHAUST HEAD



FIG. 947

These heads are made of best quality cast iron and will last indefinitely.

Made in one solid piece, external and internal, and there are therefore no internal parts to rust or corrode out or become adrift.

Absolutely no back-pressure on the engine.

All water and grease is positively removed from the escaping vapor, thereby preventing rotting of roofs and walls, spattering of sidewalks and buildings and accumulation of ice.

Sectional cut shows the three changes in direction of exhaust steam before leaving the head.

The steam on entering the head is immediately changed in its direction and then expands into larger volume during the next change of direction and comes in contact with baffle located on inside of outer shell placed

central between the inlet and outlet openings. All moisture clinging to outer surface then falls to bottom of head to drip pipe.

The steam is once more changed in direction and leaves exhaust head through larger opening than inlet of same.

Sizes up to and including 4 inches are for screwed pipe connections; all sizes above this are flanged.



FIG. 948

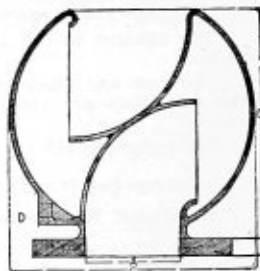


FIG. 949

A—Size Exhaust Pipe in Inches	B	C	D	Price
1½ or 2				\$25.00
2½ or 3				30.00
3½ or 4				40.00
4½ or 5				50.00
6				60.00
7				75.00
8				90.00
9				105.00
10				125.00
12				150.00
14				200.00
16				250.00

"SWARTWOUT" CAST-IRON EXHAUST HEADS



FIG. 950

The "Swartwout" Cast-Iron Exhaust Head takes water out of steam by utilizing Centrifugal Force. It is extremely simple as it has no baffle plates or other obstructions to produce back pressure, and will last a lifetime because built of cast iron.

As the whirling steam emerges from the helix tube A into the expanding portion of the head centrifugal force acts upon the water particles which have been given a circular motion by the helix. Water is about one thousand times heavier than steam, therefore, centrifugal force throws the water particles out of the current. The water collects in the annular chamber B and is removed to drip pipe C.

PRICE LIST.

Size of Exhaust Pipe, Inches	Price	Size of Exhaust Pipe, Inches	Price	Size of Exhaust Pipe, Inches	Price	Size of Exhaust Pipe, Inches	Price
1	\$20.00	4½	\$40.00	14	\$200.00	26	\$700.00
1½	20.00	5	50.00	16	250.00	28	800.00
2	25.00	6	60.00	18	300.00	30	900.00
2½	25.00	7	75.00	20	360.00	32	1000.00
3	30.00	8	90.00	22	450.00	34	1100.00
3½	30.00	10	125.00	24	600.00	36	1200.00
4	40.00	12	150.00	.....	.....	.....	.....

NOTE.—Sizes 5-inch and smaller are tapped with standard steam pipe threads. Larger sizes are equipped with standard flanges. Bolt holes of flanges are drilled to straddle center-line of drip outlet. Companion flanges furnished on sizes 6-inch to 10-inch without extra charge.

Class B Trap, 1 to 20 Lbs.



FIG. 951

NASON STEAM TRAPS

"CLASS B"

Steam Traps are designed for low pressure conditions usually found in steam heating plants.

Construction is shown in sectional view. This type should be ordered where pressures are between 1 and 20 pounds.

Class C Trap, 20 to 70 Lbs.



FIG. 952

"CLASS C"

Steam Traps are designed for standard service conditions not exceeding 70 pounds. Construction is identical with sectional illustration and this type should be specified where pressures are between 20 and 70 pounds.

Sidelug Trap, 40 to 150 Lbs.



FIG. 953

"SIDELUG"

PATENTED

Steam Traps present the same principle shown in sectional views, but reinforcing lugs are cast over the inlet and outlet, where the steam ports pass from pot to cover, so that leakage at or near these points cannot occur through the blowing out of the flange gasket. The castings are heavier throughout, with a considerable increase in the size and number of bolts, and this Trap should be universally specified for pressure ranges between 40 and 150 pounds.

No.	1	2	3	4	5
Pipe connections .....inches	1½	3¼	1	1¼	1½
Diameter flange.....inches	10¾	14¾	15¾	19	24¾
Diameter cylinder .....inches	8	10½	12	14	18
Height over valve.....inches	11	14	16¼	18½	23½
Height over cover.....inches	8	10	12	14	15½
Lineal feet 1-inch pipe.....	1500	3450	5250	7650	12000
Square feet surface.....	500	1150	1750	2550	4000
Discharge lbs. water per minute.....	4½	6½	10	15½	23
Weight, Class B and C.....	40	80	113	176	336
Weight, sidelug.....pounds	47	92	125	212	343
Class B, and Class C.....each	\$16.00	20.00	27.50	42.50	70.00
Sidelug.....each	\$16.85	21.30	29.25	45.50	74.75

Sectional View

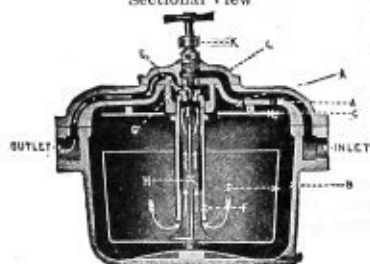


FIG. 954

All parts of these traps are interchangeable and duplicates can be supplied promptly. In ordering, the following names should be used and the style trap or pressure conditions specified.

Referring to Sectional Cut

- K—Top valve.
- L—Center cover.
- G—Main cover.
- C—Diaphragm.
- B—Pot.
- D—Float.
- F—Sleeve.
- H—Spindle.
- E—Sleeve seat.

Cover seat (not indicated) is seat for top valve K.

*Nos. 4 and 5 only.

THE GENUINE SQUIRES STEAM TRAP

The Trap for efficiency in high pressure power plants, on low pressure heating systems or any place where steam traps are required.

It is the outcome of many years' experience in the manufacture of steam traps and other steam specialties and has a supreme record.

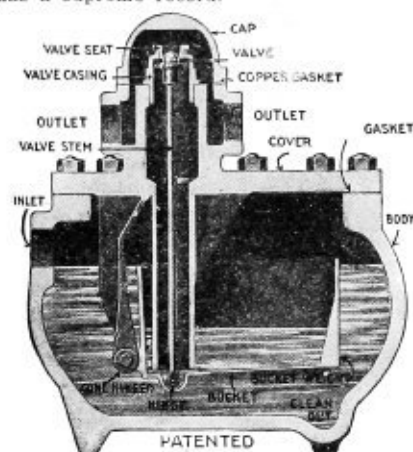


FIG. 955

FITTED WITH STANDARD VALVE MECHANISM

Size Trap	Pipe Connections, Inches	Linear Ft. of 1 in. Pipe	Capacity		Price
			Sq. Ft. of Radiation	Lbs. of Water Per Hour	
3/8	3/8	3,000	1,040	400	\$14.00
A	1/2	4,350	1,505	800	20.00
B	3/4	6,300	2,180	1,300	22.00
C	1	9,300	3,220	2,100	28.00
D	1 1/4	16,500	5,710	2,900	35.00
E	1 1/2	28,200	9,755	4,200	50.00
F	2	40,800	14,115	6,500	70.00
G	2 1/2	98,100	33,945	12,500	100.00
H	3 1/2	271,750	94,025	28,000	200.00

FITTED WITH THE DOUBLE VALVE MECHANISM

This capacity based on pressures above 100 pounds.

Size Trap	Pipe Connection	Capacity		Price
		Lbs. of Water Per Hour		
A	1/2-inch	1,200		\$24.00
B	3/4-inch	1,800		27.00
C	1-inch	2,800		34.00
D	1 1/4-inch	3,800		42.00
E	1 1/2-inch	5,600		60.00
F	2-inch	10,000		84.00
G	2 1/2-inch	18,000		120.00

Vacuum attachments for all size traps, \$2.00 extra.

NOTE.—In ordering, state highest pressure under which trap is to be operated.

We furnish traps with regular valves and seats for any of the following pressures at the same price: 0 to 10 pounds; 0 to 30 pounds; 0 to 60 pounds; 0 to 100 pounds; 0 to 150 pounds; 0 to 200 pounds, and upwards.

WRIGHT "EMERGENCY" HIGH PRESSURE STEAM TRAPS

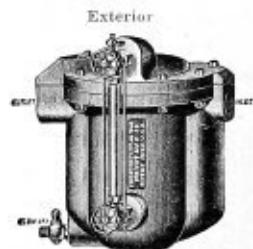


FIG. 956

Wright Steam Traps for high pressure service are designed, constructed and guaranteed to drain automatically and continuously all accumulated condensation from steam pipes, regardless of small floods of water, without steam waste in the operation.

Wright "Emergency" Steam Traps have gained an enviable reputation for efficiency and general excellence, and will be found to-day in a majority of the steam plants in which thoroughly modern equipment is made a feature. No effort has been spared to make them perfect in every detail.

Three steam-tight valves are located at the highest point of the trap, where they are entirely removed from accumulations of grit, scale, sediment, etc., therefore they can hardly become inoperative from the causes named. The condensation enters the trap, filling it to about the center and forming a seal of from 4 to 6 inches of water at both inlet and outlet, which prevents any possible escape and waste of steam. When thus filled, the float rises and opens the center valve (indicated as valve No. 1 as shown in the enlarged view of the valve arrangement shown in Fig. 1014) slightly, if there is but little water coming in, but widely if a sudden inflow. This one valve is equal to the task of taking care of the flow under ordinary conditions, but if the water comes into the trap faster than one valve can discharge it, the water rises in the trap, carrying the float with it and opening valve No. 2 sufficiently to discharge the surplus water, or wide open if necessary. Valve No. 3

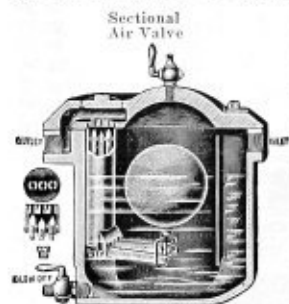


FIG. 957

is opened in the same manner, providing for the full capacity of the inlet pipe, but it rarely happens that the volume of condensation coming into the trap is sufficient to tax the combined capacity of all three valves. Ordinarily one valve alone is able to do the work leaving two valves in reserve for emergencies.

All working parts are attached to the cover and are accessible without disturbing the piping in the least.

The valve and valve seats are clearly shown in the illustration. Both valves and valve seats are made of the best steam jet metal, and may be renewed or repaired if necessary without removing the cover from the trap, by unscrewing the iron plug over the tube, when the valve seats may be easily taken out with a screwdriver.

Number	1	2	3	4	5	6	7	8
Capacity, Lineal Ft. of 1-in. pipe	7200	9300	11400	19710	31500	50250	73050	105000
Capacity, radiation, Sq. Ft.	2400	3100	3900	6570	10500	16750	24350	35065
Maximum Discharge per hr. Lbs.	997	1262	1550	2625	4200	6700	9740	14026
Inlet and Outlet In.	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Distance through Inlet and Outlet In.	$11\frac{1}{4}$	12	$12\frac{3}{4}$	$13\frac{3}{4}$	$15\frac{1}{4}$	$16\frac{1}{2}$	18	$19\frac{1}{4}$
Price each	\$26.50	28.50	36.00	43.00	60.00	82.00	132.00	150.00

"Emergency" Steam Traps are guaranteed on all steam pressures up to 200 pounds.

STRONG STEAM TRAPS

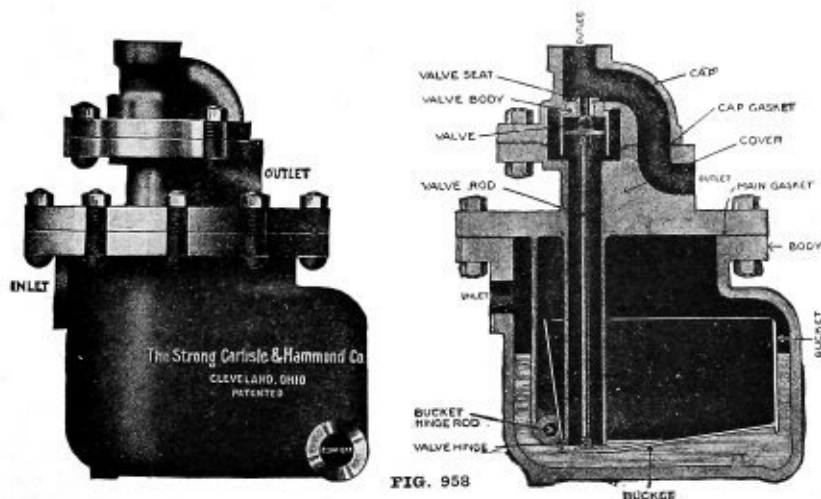


FIG. 958

These Traps will automatically remove the condensation from any system operated above atmospheric pressure, whether steam, gas or air, and as the outlet discharge tube is always water sealed it is impossible for steam or gas to escape.

For computing the equal of one-inch pipe of other pipe sizes, the following table will be found convenient for figuring the size of trap necessary to remove the condensation from a given amount of a certain type size of pipe.

Multiply the number of feet of any size pipe by the number given under the pipe size and the product will give its equivalent in one-inch pipe.

Inches	1/2	3/4	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8
Price	.05	.75	1.25	1.44	1.81	2.19	2.66	3.04	3.42	3.80	4.23	5.03	5.80	6.55

We furnish at the same price for different pressures, as follows:

Gravity Traps, 10 pounds or less.....	Code word.	Dime
Low Pressure Traps, 10 pounds to 30 pounds.....	"	Dent
Standard Pressure Traps, 30 pounds to 125 pounds.....	"	Dorn
High Pressure Traps, 125 pounds and upwards.....	"	Dart

Number	0	1	2	3	4	5
Size pipe connection.....	1/2	3/4	1	1 1/4	1 1/2	2
Capacity in lbs. of water per hour	500	700	1,800	2,500	4,000	6,500
Capacity lin. feet of 1-in. pipe..	4,500	6,300	10,500	16,000	36,000	52,000
Capacity in sq. ft. of radiation..	1,500	2,100	3,600	5,400	12,000	17,000
Shipping weight	75	75	120	155	225	355
Price	\$27.50	\$30.50	\$40.00	\$55.00	\$75.00	\$105.00

For drying lumber, greenhouses or moist goods, divide linear and square feet ratings by two. For brick kilns, laundries or wet goods, divide by three. For fan systems and blower coils, divide by five. NOTE—Unless otherwise specified, Standard Pressure Traps will be shipped.

ANDERSON MODEL "D" STEAM TRAP

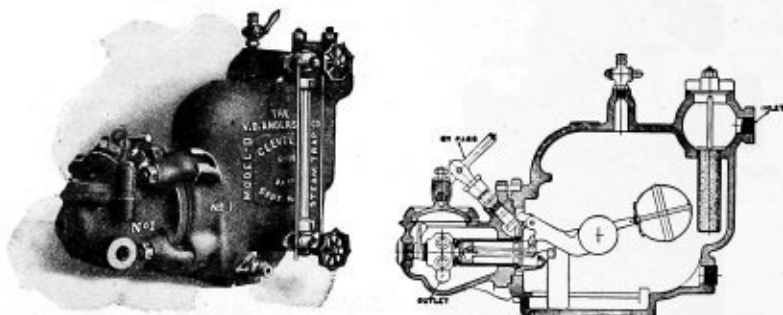


FIG. 959

The Anderson is the ideal steam trap because it automatically and continuously drains the condensation from radiators, steam coils or heating system as fast as it accumulates without reducing the pressure or permitting the escape of live steam, thus permitting the highest efficiency from every square foot of heating surface in the apparatus to which the steam trap is attached. A comparatively small amount of heating surface will oftentimes accomplish the result required, provided live hot dry steam can be kept in contact with it, and condensed water is not allowed to accumulate.

Size number of trap	1	2	3	4	5	6	7
Size of pipe connection in inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Maximum discharge of condensation, per hour in pounds	1500	2400	4000	5600	8000	12000	24000
Greatest number of square feet of surface that should be applied	1000	1600	2600	4700	7000	10000	20000
Greatest number of lineal feet of 1-inch pipe surface that should be applied....	3000	5000	8000	14000	20000	30000	60000
Net weight of complete trap, in pounds	81	92	150	166	268	321	525
Shipping weight, in pounds (boxed)	110	114	195	211	335	394	640
Price	\$26.50	28.50	36.00	43.00	60.00	82.00	132.00

Our Model "D" trap is suitable for any pressure from 225 pounds down. Our standard valve opening is adapted for pressures from 150 pounds down to 30 pounds. Our low pressure valve opening is adapted for pressures from 30 pounds down. For pressures below 10 pounds or above 150 pounds, we are prepared to furnish special valve openings.

NOTE.—When ordering be sure to state maximum steam pressure at the trap.

KIELEY STANDARD STEAM TRAP

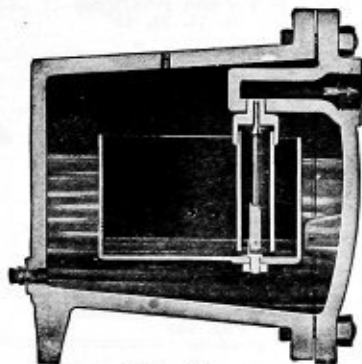


FIG. 960

NO. 708—LOW PRESSURE, 1 TO 30 LBS.

NO. 710—HIGH PRESSURE,
30 TO 125 LBS.

These traps should never be applied to pressures higher than that stamped on the brass plates attached to each trap. They will, however, work satisfactorily on lower pressures but with an approximately decreased capacity. The capacity of any trap depends entirely on the difference between the pressures on the inlet to the trap and the pressure on the outlet from the trap, together with the size of the discharge valve.

Number of Trap	1	2	3	4	5	6	7
Inlet and Outlet	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Capacity in lbs. of water per hour...	500	725	1,200	2,000	3,000	4,000	6,000
Capacity in sq. ft. of radiation.....	1,000	2,000	3,300	5,000	8,300	11,500	16,500
Capacity in lineal ft. of 1-in. pipe...	4,000	6,000	10,000	15,000	25,000	35,000	50,000
Price	\$25.00	35.00	45.00	60.00	80.00	100.00	125.00

VANCE STEAM TRAP

EXTRA LARGE VALVE OPENING

Guaranteed to handle condensation as fast as it can come through inlet pipe.

Monel White Metal Valves and
Seat at small extra cost.

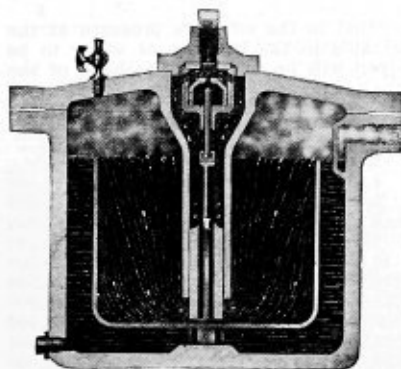


FIG. 961

Size of Inlet and Outlet	List Prices Less Discount	DIMENSIONS			Wt. lbs.
		A Flange Diam. ins.	B Total Height ins.	C Base to In- let in.	
$\frac{3}{4}$	\$ 21.20	12	$10\frac{3}{4}$	$6\frac{3}{4}$	85
1	29.25	$13\frac{3}{4}$	$12\frac{3}{4}$	8	100
$1\frac{1}{4}$	45.50	$15\frac{3}{4}$	$14\frac{3}{4}$	$9\frac{1}{2}$	145
$1\frac{1}{2}$	74.75	$17\frac{3}{4}$	$16\frac{3}{4}$	$10\frac{3}{4}$	210
2	90.00	$19\frac{1}{2}$	$18\frac{3}{4}$	$12\frac{3}{4}$	285
2 or $2\frac{1}{2}$	125.00	$20\frac{1}{2}$	$20\frac{3}{4}$	13	450
2 or $2\frac{1}{2}$	150.00	22	$22\frac{3}{4}$	$14\frac{1}{4}$	500

USE LARGE TRAPS

You get more trap per dollar when you use $1\frac{1}{4}$ in. or larger. They are made extra heavy. Large traps can be bushed down to suit pipe connections.

Specify size and maximum working pressure.

CRANETILT NON-RETURN STEAM TRAPS
FOR STEAM WORKING PRESSURES UP TO 250 POUNDS
 Nos. 30, 32, 33, 34, 35 Nos. 36, 37, 38, 39



FIG. 962

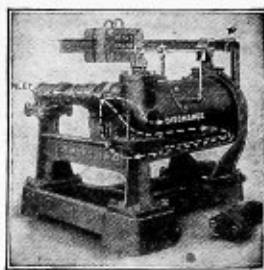


FIG. 963

Pipe Connections Size of Inlet and Outlet Inches	Number of Trap	List Price, Including Sediment Trap and Wrench	Approximate Shipping Weight, Pounds
$\frac{1}{4}$	30	\$ 32.50	95
$\frac{1}{2}$	32	55.00	170
$\frac{3}{4}$	33	75.00	250
1	34	100.00	320
$1\frac{1}{4}$	35	145.00	510
$1\frac{1}{2}$	36	210.00	850
2	37	300.00	1,175
$2\frac{1}{2}$	38	425.00	1,750
3	39	550.00	2,600

RATINGS OF CRANETILT NON-RETURN TRAPS
POUNDS OF WATER DISCHARGED PER HOUR WITH VARIOUS
EFFECTIVE PRESSURES AT THE TRAP

The capacity of any steam trap depends on the area of the valve opening and the effective pressure available at the trap.

To determine the size of a Cranetilt Non-Return Steam Trap by the following table:

Find in the first column the pressure equal to the effective pressure at the trap; follow the horizontal line across the table to the quantity of water to be handled; the correct size and number of trap will be found at the head of the column.

Pressure at Trap	Number of Trap and Size of Inlet and Outlet								
	30— $\frac{1}{4}$ -in.	32— $\frac{1}{2}$ -in.	33— $\frac{3}{4}$ -in.	34— 1-in.	35— $1\frac{1}{4}$ -in.	36— $1\frac{1}{2}$ -in.	37— 2-in.	38— $2\frac{1}{2}$ -in.	39— 3-in.
5	372	930	1,860	3,100	4,650	6,200	9,300	12,400	15,500
10	528	1,320	2,640	4,400	6,600	8,800	13,200	17,600	22,000
15	648	1,620	3,240	5,400	8,100	10,800	16,200	21,600	27,000
20	756	1,890	3,780	6,300	9,450	12,600	18,900	25,200	31,500
25	852	2,130	4,260	7,100	10,650	14,200	21,300	28,400	35,500
30	920	2,310	4,620	7,700	11,550	15,400	23,100	30,800	38,500
40	1,080	2,700	5,400	9,000	13,500	18,000	27,000	36,000	45,000
50	1,200	3,000	6,000	10,000	15,000	20,000	30,000	40,000	50,000
60	1,320	3,300	6,600	11,000	16,500	22,000	33,000	44,000	55,000
75	1,488	3,720	7,440	12,400	18,600	24,800	37,200	49,600	62,000
100	1,704	4,260	8,520	14,200	21,300	28,400	42,600	56,800	71,000
125	1,896	4,740	9,480	15,800	23,700	31,600	47,400	63,200	79,000
150	2,064	5,160	10,320	17,200	25,800	34,400	51,600	68,800	86,000
175	2,292	5,730	11,460	19,100	28,650	38,200	57,300	76,400	95,500
200	2,400	6,000	12,000	20,000	30,000	40,000	60,000	80,000	100,000
250	2,700	7,750	13,500	22,500	33,750	45,000	67,500	90,000	112,500

CRANETILT DIRECT RETURN STEAM TRAPS **FOR STEAM WORKING PRESSURES UP TO 250 POUNDS**

Nos. 90, 91, 92, 93

Nos. 94, 95, 96, 97, 98

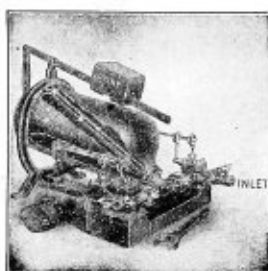


FIG. 964
SERIES 90—PRICE LIST AND CAPACITIES

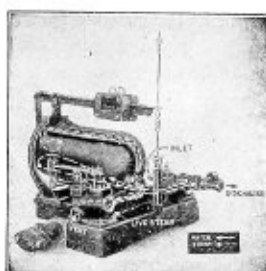


FIG. 965

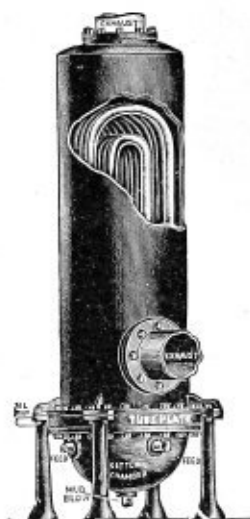
Pipe Connections		Number of Trap	List Price, Includ'g Sediment Trap, Two Swing Check Valves, Tee, Nipples and Wrench	Approx. Shipping Weight, Pounds	Capacities per Hour, Based on Ordinary Condensing Conditions			
Size of Water Inlet and Discharge, Inches	Size of Steam and Vent Valve, Inches				Lineal Feet of 1 inch Pipe Trap Will Drain, Feet	Pounds of Water Trap Will Discharge Into Boiler, Pounds	Gallons of Water Trap Will Discharge Into Boiler, Gallons	Square Feet of Radiation Trap Will Drain, Square Feet
$\frac{1}{2}$	$\frac{1}{2}$	90	\$ 75.00	187	4,000	800	96	1,333
$\frac{3}{4}$	$\frac{3}{4}$	91	95.00	260	7,500	1,500	180	2,500
1	1	92	125.00	375	12,500	2,500	300	4,167
$1\frac{1}{4}$	$1\frac{1}{4}$	93	175.00	527	18,000	3,600	432	6,000
$1\frac{1}{2}$	$1\frac{1}{2}$	94	250.00	850	25,000	5,000	600	8,333
2	2	95	370.00	1,175	39,000	7,800	936	13,000
$2\frac{1}{2}$	$2\frac{1}{2}$	96	525.00	1,750	57,500	11,500	1,380	19,167
3	3	97	675.00	2,600	77,500	15,500	1,860	25,833
4	3	98	925.00	3,900	140,000	28,000	3,360	46,667

CRANETILT STEAM TRAPS **THREE VALVE LIFTING** **FOR STEAM WORKING PRESSURES UP TO 250 POUNDS** **SERIES 100—PRICE LIST AND CAPACITIES**

Pipe Connections		Number of Trap	List Price, Includ'g Sediment Trap, Swing Check Valve, Nipple and Wrench	Approx. Shipping Weight, Pounds	Capacities per Hour, Based on Ordinary Condensing Conditions			
Size of Water Inlet and Discharge, Inches	Size of Steam and Vent Valve, Inches				Lineal Feet of 1 inch Pipe Trap Will Drain, Feet	Pounds of Water Trap Will Discharge, Pounds	Gallons of Water Trap Will Discharge, Gallons	Square Feet of Radiation Trap Will Drain, Square Feet
$\frac{1}{2}$	$\frac{1}{2}$	100	\$ 90.00	213	4,000	800	96	1,333
$\frac{3}{4}$	$\frac{3}{4}$	101	110.00	270	7,500	1,500	180	2,500
1	1	102	145.00	395	12,500	2,500	300	4,167
$1\frac{1}{4}$	$1\frac{1}{4}$	103	200.00	542	18,000	3,600	432	6,000
$1\frac{1}{2}$	$1\frac{1}{2}$	104	300.00	875	25,000	5,000	600	8,333
2	2	105	425.00	1,275	39,000	7,800	936	13,000
$2\frac{1}{2}$	$2\frac{1}{2}$	106	600.00	1,800	57,500	11,500	1,380	19,167
3	3	107	775.00	2,650	77,500	15,500	1,860	25,833
4	3	108	1,075.00	4,000	140,000	28,000	3,360	46,667

THE PATTERSON-BERRYMAN FEED WATER HEATER AND PURIFIER

FOR HEATING WATER FOR BOILERS OR OTHER PURPOSES WITH EXHAUST STEAM



The Patterson-Berryman Feed Water Heater and Purifier cannot get out of order. It is easily cleaned and is thoroughly tested before shipment. It consists only of a shell containing a number of rows of U-shaped seamless drawn brass tubes, both ends of each tube being expanded in a heavy cast iron tube-head, and a settling chamber for collecting and blowing off the scale-forming impurities contained in the feed water. This heater is fully guaranteed.

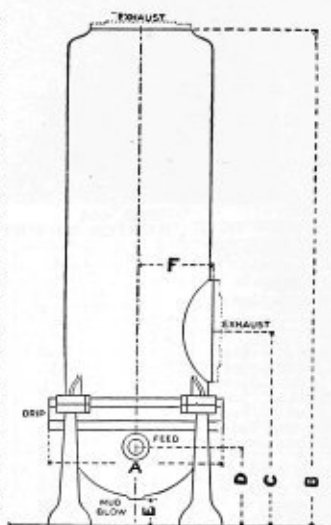


FIG. 966

Boiler Horse Power	Dimensions in Inches								Approx. Wt. Lbs.	Price
	Dia. Height		C	D	E	F	Connections (Standard)			
	A	B					Ex-haust	Feed		
Up to										
Cast Iron Shell	40	15x 42	22	12	7	6	3	1	350	\$ 120.00
	50	15x 50	22	12	7	6	4	1	400	140.00
	60	15x 56	22	12	7	6	4	1 1/4	450	160.00
	80	15x 68	22	12	7	6	5	1 1/4	525	190.00
	100	18x 62	23	11	7	7	6	1 1/2	650	225.00
	125	18x 70	23	11	7	7	6	1 1/2	725	280.00
	150	18x 78	23	11	7	7	6	1 1/2	800	325.00
	200	23x 88	31	18	10	9	8	2	1,125	385.00
Boiler Plate Shell	250	23x100	31	18	10	9	8	2	1,275	450.00
	300	26x 90	34	16	10	11	10	2	1,475	510.00
	350	26x102	34	16	10	11	10	2 1/2	1,600	575.00
	400	28x100	42	16	10	13	10	2 1/2	1,650	670.00
	500	28x115	42	18	10	13	12	2 1/2	1,800	825.00
	600	28x130	42	18	10	13	12	3	1,950	1,000.00
	700	32x110	45	16	10	15	12	3	2,525	1,200.00
	800	32x120	45	16	10	15	14	3	2,750	1,300.00
1,000	32x140	45	16	10	15	14	3 1/2	3,000	1,550.00	

Cast Iron Shells
Boiler Plate Shells

GARDNER AIR COOLED AIR COMPRESSORS

"Midget"

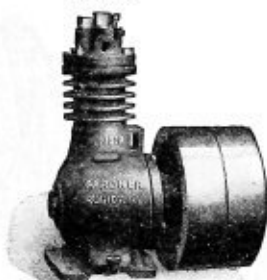


FIG. 967

"Gee-Gee"



FIG. 968

These air compressors are designed for garage work. Are simple, have few parts and cannot get out of order, being practically "fool-proof." Their lubrication is the oil splash system, which is so perfect that every part is drenched with oil at each revolution. Both machines are light in weight and occupy small floor space.

Type Machine	Midget	Gee Gee
Size	2x1½	3x3
Capacity	1½	7.6
Speed	800	600
Continuous working pressure	125	125
Pulley	7x1½	12x2½
Floor space	7x1	12x15
Height	12	22
Shipping weight	38	117
Shipping weight with T. & L. Pulleys	43	135
Price, regular pulley	\$24.00	\$45.00
Price, tight and loose pulley	28.00	50.00

WITH TIGHT PULLEY ONLY

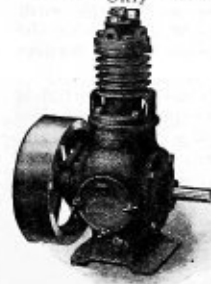
With Tight Pulley
Only

FIG. 969

Size	2-in. Cyl. 2½ Stroke	2½-in. Cyl. 3 Stroke	3-in. Cyl. 3½ Stroke
Capacity, cu. ft. per min.	2½	5	8
Time required to fill a 34x 4-in. tire from complete deflation to 90 lbs.	1¾ min.	1 min.	¾ min.
Size of discharge pipe	¾	½	¾
Revolutions per minute	600	600	600
Horse power, 100 pounds pressure	½	1	1½
Diameter pulley	8 in.	10 in.	14 in.
Width of belt	2 in.	2 in.	2½ in.
Maximum pressure—Lbs.			
Continuous service	125	125	125
Intermittent service	200	200	200
Outside dimensions	8x11¼	10x14¼	14x17
Extreme height	16½	19½	22¼
Shipping weight—Lbs.	50	80	150
PRICE	37.50	\$48.00	\$76.00

MASTER GARAGE PUMPS

MODEL "W"

Portable Type

Stationary Type



FIG. 970

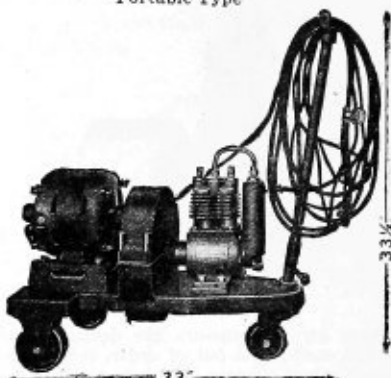


FIG. 971

Consists of a sturdy, efficient, two-cylinder pump (bore $1\frac{3}{4}$ " stroke 2") driven by a $\frac{1}{2}$ H. P. electric motor, mounted on a neat metal truck. Running at normal speed (500 R. P. M.) this machine will deliver three cubic feet of free air per minute or will completely inflate a 37"x5" tire from flat to 90 lbs. pressure in less than $1\frac{1}{2}$ minutes.

Pistons are of special steel, carefully hardened and ground to exact size and lapped into the cylinders. No rubber or leather packing rings are used in the entire construction. This insures maximum efficiency at all times and great wearing qualities.

No tank is required. Pump acts directly into the tires. A small expansion chamber is attached, however, which removes all impurities from the air and it is absolutely impossible for any oil to get into the delicate inner tubes of the tires.

Regular equipment includes 20 feet of electric cord and 20 feet of heavy wire bound rubber air hose with tire pressure gauge attached.

There is no expense for installing this outfit. It is only necessary to connect the motor by means of the plug and electric cord furnished, to an electric light circuit and the outfit is all ready for service.

We also furnish a small nozzle to fit on the end of the hose so that the outfit may be used as a compressed air cleaner. It is very handy as such for blowing the dust out of various obscure parts of the upholstery and the little nooks and corners in a car which are hard to reach with a brush or otherwise.

The above cut shows outfit mounted on a truck with wheels and handle, but if preferred, it can be mounted on a stationary base at the same price, and where desired makes a very satisfactory outfit to use in connection with a stationary tank installation.

Price, with Alternating Current Motor.....	\$160.00
Price, with Direct Current Motor.....	150.00

STATE CURRENT CONDITIONS WHEN ORDERING

Our stock motors are for 110 or 220 volt, direct current and 110 or 220 volt, single phase, 60 cycle alternating current. Motors for special current conditions to special order only.

MASTER GARAGE PUMPS Model "Y"

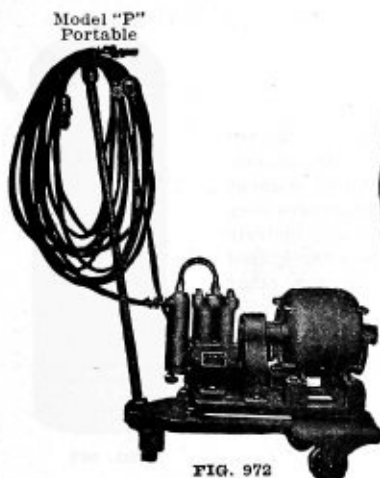


FIG. 972

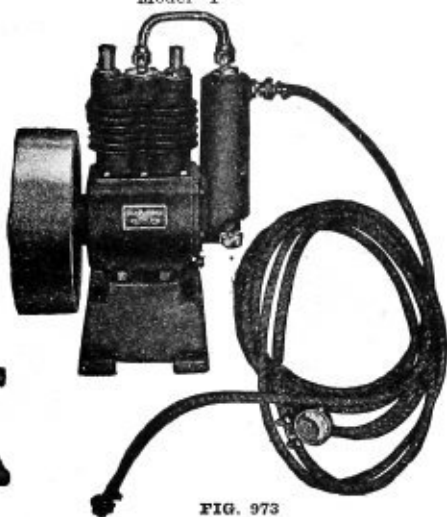


FIG. 973

MODEL "P" GARAGE PUMP

The equipment consists of a two-cylinder pump, mounted on a frame and driven by a $\frac{1}{2}$ H. P. General Electric motor.

With each outfit is furnished 20 feet of best reinforced rubber air hose, with pressure gauge attached, and 20 feet of lamp cord with plug to connect to any lamp socket. Will completely inflate a 37x5 tire to 90 lbs. pressure in less than three minutes.

Price, with Alternating Current Motor.....\$105.00
 Price, with Direct Current Motor.....100.00

For use in public garages or very large private ones, we mount this equipment on a neat metal truck with wheels and handle, as shown by cut.

Priceextra \$8.00

STATE CURRENT CONDITIONS WHEN ORDERING

Our stock motors are for 110 or 220 volt, direct current and 110 or 220 volt, single phase, 60 cycle, alternating current. Motors for special current conditions to special order only.

MODEL "Y" GARAGE PUMP

Model "Y" Master Garage Pump is an ideal outfit for the garage or repair shop with a line of shafting installed. It may be mounted on a shelf or on the floor, out of the way, but always ready for service. To operate, it is only necessary to belt it up to a pulley on your shaft or any other driving mechanism.

Regular equipment includes 20 feet of heavy wire bound rubber air hose with tire pressure gauge attached.

We also furnish a small nozzle to fit on the end of the hose so that the outfit may be used as a compressed air cleaner. It is very handy as such for blowing the dust out of various obscure parts of the upholstery and the little nooks and corners in a car which are hard to reach with a brush or otherwise.

Model "Y" may be efficiently operated at any speed from 300 R. P. M. to 650 R. P. M., but we recommend about 500 R. P. M. for best results. At this speed it will deliver 3 cubic feet of free air per minute or will completely inflate a 37"x5" tire from flat to 90 lbs. in less than 2 minutes. Net weight complete, 65 lbs.

Price complete\$60.00

GARAGE AIR STORAGE TANKS



FIG. 974

These Copper-Brazed Air Tanks are absolutely air-tight and are guaranteed to hold air indefinitely without any loss of pressure. For garages they are ideal. It has been conclusively proved by actual tests that the brazed seams are stronger than any other part of the tank.



FIG. 975

Riveted and calked tanks are not absolutely air-tight, and cannot prevent the air from gradually escaping. Moreover, the best made single-riveted seam is only 50% as strong as the material it holds together, and a double riveted seam about 70%.

These Brazed Tanks are thoroughly tested to twice the working pressure and are designed to have a theoretical factor of safety of five.

Nominal Capacity	Dimensions over all	100 lb. Pressure		150 lb. Pressure		200 lb. Pressure	
		Painted	Galvd.	Painted	Galvd.	Painted	Galvd.
15 Gals.	12" dia. x 36"	\$ 7.00	\$ 8.00	\$10.00	\$12.00	\$12.00	\$13.00
30 Gals.	14" " 48"	12.00	14.00	16.00	17.00	21.00	23.00
40 Gals.	16" " 48"	17.00	19.00	22.00	24.00	30.00	32.00
50 Gals.	16" " 60"	20.00	23.00	27.00	29.00	36.00	39.00
75 Gals.	18" " 72"	29.00	33.00	41.00	45.00	58.00	61.00
105 Gals.	24" " 60"	45.00	50.00	69.00	74.00	76.00	82.00

The above prices include no fittings. The openings can be tapped to suit individual requirements, but unless otherwise specified the tanks are provided with three one-inch pipe openings; one in head and two in shell. These holes can be readily reduced with bushings to any other sizes desired for gauge, inlet and discharge openings.

For private garages the 16" x 48" tank for 150 lbs. working pressure is the one most generally used. In addition to the tanks above listed we can furnish any other size required.

UNION ENCLOSED-TYPE COMPRESSORS

Belt Driven, Size 10x10

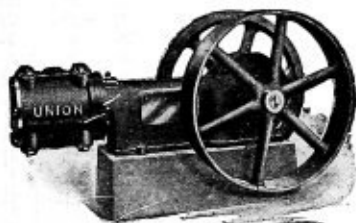


FIG. 976

Steam-Driven, Showing type of 12x14x12 and smaller



FIG. 977

Built in all sizes and combinations, both single and duplex, from 6-inch to 20-inch cylinders, furnishing 51 to 1,150 cubic feet free air per minute. We also build vertical belt-driven compressors in still smaller sizes.

For sizes, etc., see following page.

SINGLE BELT-DRIVEN ENCLOSED-TYPE AIR-COMPRESSORS

CODE WORD	Air Cylinder		Revolutions per Minute	Displacement Cubic Feet Free Air		Maximum Air Pressure	Brake Horse- Power Required at Pressure Stated	Pipe Openings			Driving Pulley		Diameter Fly-Wheel
	Diameter	Stroke		Per Revolution	Per Minute			Suction	Discharge	Cooling Water Inlet	Diameter	Width of Belt	
Crab	6 $\frac{1}{2}$	6	275	.205	57	100	10	2	2	1 $\frac{1}{2}$	28	6	28
Crag	8	6	275	.349	96	50	12	2 $\frac{1}{2}$	2 $\frac{1}{2}$	1 $\frac{3}{4}$	28	6	28
Cran	8	8	265	.467	124	100	22	2 $\frac{1}{2}$	2 $\frac{1}{2}$	1 $\frac{3}{4}$	42	8	42
Crack	9	8	265	.590	156	85	26	3	3	1 $\frac{3}{4}$	42	8	42
Crape	10	8	265	.730	193	75	30	3	3	1 $\frac{3}{4}$	42	8	42
Crank	12	8	265	1.05	278	50	35	3 $\frac{1}{2}$	3 $\frac{1}{2}$	1 $\frac{3}{4}$	42	8	42
Crash	10	10	250	.91	228	100	41	3	3	1 $\frac{3}{4}$	48	10	48
Crawl	12	10	250	1.30	325	80	52	4	4	1 $\frac{3}{4}$	54	10	54
Cray	14	10	250	1.78	445	60	63	4 $\frac{1}{2}$	4 $\frac{1}{2}$	1 $\frac{3}{4}$	54	10	54
Crazy	10	12	235	1.09	246	100	46	3 $\frac{1}{2}$	3 $\frac{1}{2}$	1 $\frac{3}{4}$	54	10	54
Cramp	12	12	235	1.58	371	100	66	4	4	1 $\frac{3}{4}$	66	12	55
Craze	14	12	235	2.14	501	85	83	4 $\frac{1}{2}$	4 $\frac{1}{2}$	1 $\frac{3}{4}$	66	12	55
Crap	16	12	235	2.79	655	60	92	5	5	1 $\frac{3}{4}$	66	12	55
Crano	18	12	235	3.54	830	40	99	6	6	1 $\frac{3}{4}$	66	12	55
Crass	14	15	210	2.68	561	100	101	4 $\frac{1}{2}$	4 $\frac{1}{2}$	1 $\frac{3}{4}$	72	15	60
Crate	16	15	210	3.49	730	85	121	5	5	1 $\frac{3}{4}$	72	15	60
Craft	18	15	210	4.42	929	60	130	6	6	1 $\frac{3}{4}$	72	15	60
Crane	20	15	210	5.46	1146	40	135	7	7	1 $\frac{3}{4}$	72	15	60

SINGLE STEAM-DRIVEN ENCLOSED-TYPE AIR-COMPRESSORS

CODE WORD	Size of Compressor			Revolutions Per Minute	Displacement Cubic Feet Free Air		Maximum Air Pressure	Required Steam Pressure $\frac{1}{2}$ Cut Off	I. H. P. of Steam Cylinder at Pressure Stated	Pipe Openings				
	Diameter Steam Cylinder	Diameter Air Cylinder	Stroke		Per Revolution	Per Minute				Steam	Exhaust	Suction	Discharge	Cooling Water Inlet
Creak	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6	275	.205	57	100	75	10	1 $\frac{1}{2}$	2	2	2	1 $\frac{1}{2}$
Cream	6 $\frac{1}{2}$	8	6	275	.349	96	50	12	12	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	2 $\frac{1}{2}$	1 $\frac{1}{2}$
Creap	8	8	8	265	.467	124	100	75	22	2	2 $\frac{1}{2}$	3	3	1 $\frac{1}{2}$
Creat	8	9	8	265	.59	163	85	95	26	2	2 $\frac{1}{2}$	3	3	1 $\frac{1}{2}$
Crenk	8	10	8	265	.73	193	75	100	30	2	2 $\frac{1}{2}$	3	3	1 $\frac{1}{2}$
Crepo	8	12	8	265	1.05	278	50	110	35	2	2 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	1 $\frac{1}{2}$
Crepv	10	10	10	250	.91	228	100	75	41	3	3 $\frac{1}{2}$	3	3	1 $\frac{1}{2}$
Crema	10	12	10	250	1.30	325	80	100	52	3	3 $\frac{1}{2}$	4	4	1 $\frac{1}{2}$
Crelo	10	14	10	250	1.78	445	60	115	63	3	3 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	1 $\frac{1}{2}$
Crepe	10	12	12	235	1.09	256	100	75	46	3	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	1 $\frac{1}{2}$
Crept	10	12	12	235	1.58	370	100	110	66	3	3 $\frac{1}{2}$	4	4	1 $\frac{1}{2}$
Cresp	10	14	12	235	2.14	501	85	130	83	3	3 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	1 $\frac{1}{2}$
Crestr	12	12	12	235	1.09	276	100	60	46	3 $\frac{1}{2}$	4	4	4	1 $\frac{1}{2}$
Crete	12	12	12	235	1.58	371	100	75	66	3 $\frac{1}{2}$	4	4	4	1 $\frac{1}{2}$
Cree	12	14	12	235	2.14	501	85	100	83	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$	4 $\frac{1}{2}$	1 $\frac{1}{2}$
Crevo	12	16	12	235	2.79	655	60	110	92	3 $\frac{1}{2}$	4	5	5	1 $\frac{1}{2}$
Crew	12	18	12	235	3.54	830	40	110	99	3 $\frac{1}{2}$	4	6	6	1 $\frac{1}{2}$
Crebo	14	14	15	210	2.68	561	100	75	101	4	5	4 $\frac{1}{2}$	4 $\frac{1}{2}$	1 $\frac{1}{2}$
Crey	14	16	15	210	3.49	730	85	90	121	4	5	5	5	1 $\frac{1}{2}$
Creo	14	18	15	210	4.42	929	60	100	130	4	5	6	6	1 $\frac{1}{2}$
Creky	14	20	15	210	5.46	1146	40	100	135	4	5	7	7	1 $\frac{1}{2}$

INFORMATION REQUIRED FOR ESTIMATES FOR PUMPING PLANTS

1. For what service is the pump to be used?
2. What is the liquid to be pumped? And is it hot, cold, clear, gritty, acid, fresh or salt?
3. From what source is the supply to be taken?
4. What is the maximum quantity to be pumped per hour?
5. To what height is liquid to be lifted by suction? What is the length and diameter of suction pipe, and number of angles or turns?
6. To what height or against what pressure is liquid to be forced? What is the length and diameter of delivery pipe, and the number of angles or turns?
7. What power will be used to drive pump?
8. Do you wish us to figure on the power unit?
9. If you will furnish the Engine, Motor, or whatever power is necessary, advise us the kind and give the speed of the driving shaft and size of the driving pulley.
10. If an Electric Motor is used it should be either medium or slow speed. High speed motors should never be used on pumping outfits.
11. Is pump to be driven by direct connection, belt, gearing, or otherwise?
12. When electric motors are to be used, please state whether the current available is direct current or alternating current, and give its voltage. If the current is alternating current, state whether it is a single-phase or three-phase, and state how many cycles per second.
13. If steam pressure is to be used state the boiler pressure, distance from boiler to pump and whether it will exhaust to the atmosphere, into a condenser, or into a closed pipe and if the latter, what will be the back pressure?

Be sure that you order a pump large enough for the service intended. Many make the mistake of ordering a pump too small. A slow piston speed is desirable, especially when pumping against heavy pressure.

FOR HOT WATER—For handling hot water, a pump should be ordered at least one-half larger than would be required for handling cold water. (At varying altitudes, the temperature at which water boils should be considered.)

INFORMATION REQUIRED FOR ESTIMATING DEEP WELL PUMPING OUTFITS

WHEN REQUESTED TO ESTIMATE ON DEEP WELL PUMPING ENGINES,
WE SHOULD BE FURNISHED WITH THE FOLLOWING
INFORMATION:

1. Depth of well in feet.....
2. Inside diameter of well from surface down to.....feet is.....
Inside diameter of well from that depth down to.....feet is.....
Inside diameter of well from last depth down to.....feet is.....
6. How many feet to water when not pumping?.....
7. State largest number gallons per minute ever pumped from well.....
8. To what depth below surface did that pumping lower water?.....
9. For how many gallons per minute shall we calculate plate?.....
10. Will less quantity answer If yes, state gallons per minute.....
12. If water is to be elevated above well, state how high.....
13. If elevated tank not over well, state feet distant.....
14. If pipe already laid from well to tank, state diameter.....
15. State number of elbows, globe and check valves in this pipe line.....
16. Is it convenient to deliver at surface, then pump to elevation?.....
17. What power will be used to drive the pump?.....
18. If steam, state boiler steam pressure.....
19. Have you ample steam supply?.....
20. How many feet will pump or compressor be from boiler?.....
21. If electric motor, is the service alternating or direct current?.....
22. If alternating current, what is the frequency, phase and voltage?.....
23. If direct current, what is the voltage?.....
24. Do you wish belt drive or direct-connected outfit?.....

DATA REQUIRED FOR ESTIMATING ON CENTRIFUGAL PUMPS

The conditions under which centrifugal pumping units operate vary considerably. In order to enable us to furnish final figures and correct recommendations by return mail, the purchaser should give the information requested below. In sending inquiries, please answer all the questions as fully as possible, for by so doing you will assist us in making proper recommendations.

PUMP

1. Number of pumps required.....
2. Capacity of each.....gallons per minute.
3. Character of fluid.....salt, fresh, clean, dirty or acidulous.
4. Temperature of liquid.....°Fah. Specific Gravity.....
5. If solid matter is contained, state size and character of largest pieces.
6. Service continuous.....Service intermittent.....
7. Total head including discharge, suction, pipe friction and velocity.....ft.
8. Suction lift (if any).....ft. Suction pressure (if any).....ft.
9. Length and diameter of discharge pipe.....
10. Number of turns in discharge pipe (state nature).
11. Length and diameter of suction pipe.
12. Number of turns in suction pipe (state nature).

MOTIVE POWER

13. Belted—Give speed of motive power.....Diameter of driving pulley.....
14. Direct connected to motor—Direct Current, Voltage.....
Alternating Current, Voltage.....Cycles.....
Phase.....
15. Direct connection to steam turbine—Steam pressure.....
Condensing..... Non-Condensing
16. Direct connection to steam engine—Steam pressure.....
Condensing..... Non-Condensing
17. Motive power furnished by purchaser.....By builder.....

The determination of the total head against which a centrifugal pump operates is most important. It is made of the sum of four factors, namely: suction lift, discharge head, friction head (due to losses in pipe line) and velocity head. The suction lift is the vertical distance from the level of the water to be pumped to the center line of the pump. If the water level is above the center line of the pump, the pump is then said to operate under a suction head and the distance must be subtracted from the sum of the remaining factors. The discharge head is the vertical distance between the center of the pump and the level to which the water is elevated. The friction head is determined by the losses in pipe lines and elbows for different sizes and capacities. The velocity head (H) is determined

$$H = \frac{V^2}{64.4}$$

by solving for H in the equation $= \frac{V^2}{64.4}$ where V is the velocity of the water at the discharge nozzle of the pump.

In all cases send sketch showing the dimensions of the pipe line which will be used with the centrifugal pumping unit. Always give the size and length of line and indicate the number and character of the bends.

WAGENER NEW IMPROVED DUPLEX STEAM PUMPS

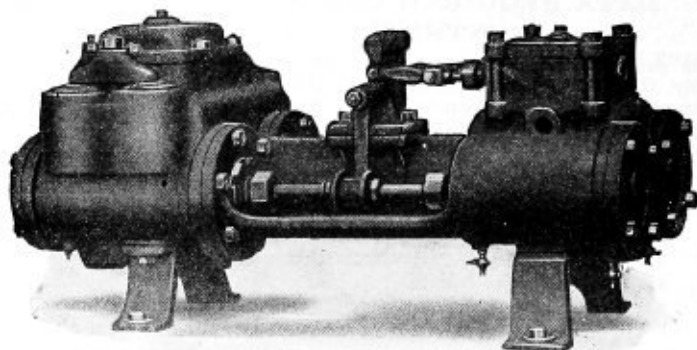


FIG. 978

"T" STYLE—LOW SERVICE TANK PUMPS FOR PRESSURES
UP TO 75 LBS.

Number of Pump	Diameter of Steam Cylinders	Diameter of Water Pistons	Length of Stroke	Gallons per Revolution	Revolutions per Minute	Capacity, Gallons per Minute	Size of Short Length Pipe to be Increased as Length increases				Approximate Shipping Weight
							Steam Connection	Exhaust Connection	Discharge Pipe	Suction Pipe	
T4	3½	2¾	4	.391	75	29.3	½	¾	1¼	1½	250
T5	4½	3½	5	.795	70	55.7	¾	1	2	2½	450
T5A	4½	4	5	1.04	70	72.8	¾	1	2	2½	450
T6	5¼	4	6	1.25	65	81.3	¾	1	2	2½	525
T6A	5¼	4½	6	1.46	65	94.8	¾	1	3	3½	700
T6B	5¼	5	6	1.80	65	117	¾	1	3	4	700
T7	6	5	6	1.80	65	117	1	1¼	3	4	950
T7A	6	6	6	2.59	65	168	1	1¼	3½	4	950
T7B	7	6	6	2.59	65	168	1¼	1½	3½	4	975
T8	7	7	10	5.88	55	324	1½	2	4	5	1800
T8A	7	8	10	8.26	55	455	1½	2	5	6	2200
T8B	7	9	10	10.46	55	575	1½	2	6	7	2300
T9	8	7	10	5.88	55	324	1½	2	5	6	2200
T9A	8	8	10	8.26	55	455	1½	2	5	6	2200
T9B	8	9	10	10.46	55	575	1½	2	6	7	2400
T9C	8	10	10	12.93	55	712	1½	2	7	8	3000
T10	10	8	10	8.26	55	455	2	2½	5	6	3200
T10A	10	9	10	10.46	55	575	2	2½	6	7	3300
T10B	10	10	10	12.93	55	712	2	2½	7	8	3400

NOTE.—One revolution equals four single strokes.

Air Chambers are furnished on all 10-inch stroke pumps.

Accessories: Each pump is supplied with all necessary plugs; drain cocks and special wrenches.

In ordering pumps refer to pages 347 to 349.

WAGENER NEW IMPROVED DUPLEX STEAM PUMPS

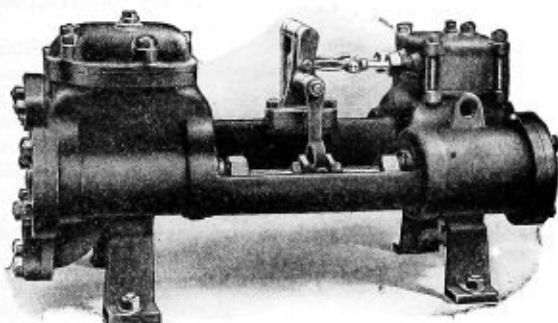


FIG. 979

The Wagener Duplex Packed Piston Pump, Style, "U," is known as the Standard Trade Pump plus. They are used for Boiler Feed or General Service where water pressure is not over 150 pounds per square inch.

Number of Pump	Diameter of Steam Cylinders		Diameter of Water Pistons	Length of Stroke	Gallons per Revolution	Revolutions per Minute	Capacity, Gallons per Minute	Horse Power Boiler, Cold Water	Horse Power Boiler, Hot Water	Size of Short Length Pipe to be Increased as Length Increases				Approximate Shipping Weight
										Steam Connection	Exhaust Connection	Discharge Pipe	Suction Pipe	
U 3	3	3	3	3	.156	80	12.5	85	75	1½	¾	1	1¼	125
U 4	3¾	3¾	3¾	4	.225	75	24.4	165	150	1½	¾	1¼	1½	175
U 5	4½	4½	4½	5	.585	70	41.	275	250	¾	1	1½	2	275
U 6	5¼	5¼	5¼	6	.953	65	62.	400	360	¾	1	2	2½	440
U 7	6	6	6	6	1.248	65	81.	550	500	1	1¼	2½	3	550
U 8	7	7	7	8	1.943	60	117.	750	675	1¼	1½	3	3½	800
U 8½	7	7	7	8	2.40	60	144.	950	850	1¼	1½	3	3½	850
U 9	8	8	8	10	3.00	55	165.	1100	1000	1½	2	3	4	1300
U 10	10	10	10	10	4.32	55	237.	1600	1440	2	2½	4	5	1700
U 10½	10	10	10	10	5.88	55	324.	2200	2000	2	2½	5	6	1800

NOTE.—One revolution equals four single strokes.

WHEN ORDERING PUMPS OR REQUESTING QUOTATIONS GIVE:

Suction lift in feet.

Length of suction pipe in feet.

Discharge pressure in pounds square inch or head in feet.

Length of discharge pipe.

Character of water or liquid.

Quantity required in gallons per minute.

Steam pressure at the pump in pounds square inch.

Also refer to pages 347 to 349.

BURNHAM HIGH-DUTY AND BOILER-FEED PUMPS**STANDARD PISTON PATTERN 150 POUNDS MAXIMUM PRESSURE**

The illustrations on the following pages represent our Regular Pattern Burnham Pumps for general service, such as boiler feeding and other high-duty work. These pumps are designed for a water pressure not exceeding 150 pounds per square inch, with the exception of the first fourteen sizes shown in the table, which are suitable for use at 200 pounds pressure per square inch. They are double-acting and have water pistons arranged for square fibrous packing suitable for handling hot or cold water.

They are regularly fitted with solid bronze piston rod; but the pumps 14x8x16 and larger are made with two-piece piston rods, of bronze in water end and steel in the steam end; the two parts of the piston rod being fastened together by a heavy coupling. This design enables the engineer to remove the water piston with the least amount of trouble and in the minimum space.

Heavy bronze linings are provided for all water cylinders; the sizes 7x4½x10 and smaller have water-cylinder linings pressed in place; on the larger pumps, removable linings are used.

This line of pump is fitted with bronze valve seats securely screwed in place with taper thread; bronze valve bolts and springs; bronze plates over each valve to provide a bearing for the springs; and hard rubber valves, unless otherwise ordered, with exception of first two sizes, which are always built with brass valves. The piston rods of 6½x4x8 pumps and larger have engine glands with two studs; the smaller sizes having bronze screwed stuffing boxes and glands.

These pumps are designed to permit of ready access to the internal parts. On the water cylinders of 12-inch diameter and larger, convenient hand-hole plates are provided, so that all water valves can be easily reached.

All the smaller pumps, including 7x4½x10, are tapped for suction and discharge pipes; 7x5x10 and larger pumps are flanged for suction and discharge pipes.

The first three sizes in this table have the steam cylinder and the water cylinder cast in one piece; the pumps having from 5 to 12-inch stroke, inclusive, are made with a cast-iron yoke; pumps with longer stroke are made with a rod yoke, built up of four substantial steel tie-rods and two heavy cast-iron heads, all securely fastened together.

The Steam Cylinders have a removable chest; the steam valves are flat-faced D slide valves accurately fitted to the valve faces, thus requiring a minimum amount of steam, and being positive and durable under all conditions of service. The main steam piston and chest piston have expansion rings.

The Valve gear is simple of construction, with external adjustment for lengthening or shortening the stroke on either end. A threaded adjustment is provided on the valve stem.

For handling hot water, and for continuous work, such as feeding boilers, we recommend a slow speed, and in order to have sufficient reserve capacity, we advise selecting a pump amply large.

This enables the engineer to run at a reasonable speed, but in an emergency the capacity of the pump may be increased by increasing the speed.

If hot water is to be pumped, always see that the supply is above the pump valves. (Four feet is good practice.) Place the pump as close to supply as possible and make sure that there is no obstruction in the suction pipe. Very frequently a suction pipe becomes clogged with lime or mud without apparent cause. If a strainer is used, it should be frequently inspected and cleaned.

When it is necessary to place the pump a considerable distance from the water supply, use pipes two or three sizes larger than the size given, reducing the size of pipes at the pump openings. Run all pipes in as direct a line as possible, avoiding all angles and turns, as they retard the flow of water to a far greater extent than length of pipes.

BURNHAM PUMPS

TABLE OF BOILER HORSE-POWER CAPACITIES

TABLE OF BOILER HORSE-POWER CAPACITY OF BURNHAM PUMPS at various speeds, based on four gallons (33½ pounds) water per horse-power per hour. In this table an allowance of ten per cent has been made for clearance and slippage. We recommend for pumping HOT WATER a piston travel of not to exceed from forty to sixty strokes per minute on pumps up to and including 5x3x6; thirty-five strokes per minute on the 5½x3½x7 up to and including the 8½x5½x10, and thirty strokes per minute on the larger sizes, although this speed may be increased or decreased as desired. Remember that other manufacturers usually base the capacity of their pumps on high piston travel, but it is always best to have a pump run slowly, and this table gives conservative capacity for the various pumps listed.

Strokes per Minute	20	25	30	35	40	50	60
Size of Pump	Boiler Horse-power Pumps Will Feed						
3 x 1½x3	....	....	....	....	17	21	25
3 x 2 x3	....	....	....	....	22	28	33
4 x 2½x3½	....	....	30	35	40	50	60
4 x 2½x5	....	35	40	50	60	70	85
5 x 3 x6	50	60	75	90	100	125	150
5½x 3½x7	80	100	120	140	160	200	235
6½x 4 x8	120	150	175	200	235	290	...
7 x 4½x10	185	235	280	325	375	465	...
7 x 5 x10	230	290	345	400	460	...	...
8½x 5 x10	230	290	345	400	460	...	...
8½x 5½x10	280	350	415	485	550	...	...
10 x 6 x12	400	500	600	700	...	...	...
10 x 6½x12	465	580	700	815	...	...	...
12 x 7 x12	545	675	810	950	...	...	...
12 x 7½x12	620	775	935	1100	...	...	...
12 x 7 x16	725	900	1080	1260	...	...	...
12 x 7½x16	825	1050	1250	1450	...	...	...
14 x 7½x12	620	775	935	1100	...	...	...
14 x 8 x12	700	880	1060	1230	...	...	...
14 x 8½x12	790	990	1190	1380	...	...	...
14 x 8 x16	950	1175	1400	1650	...	...	...
14 x 8½x16	1060	1325	1600	1850	...	...	...
14 x 9 x16	1200	1500	1800	2100	...	...	...
16 x 9 x16	1200	1500	1800	2100	...	...	...
16 x10 x16	1475	1850	2200	2600	...	...	...
18 x12 x16	2100	2650	3175	3700	...	...	...
20 x14 x16	2875	3600	4300	5000	...	...	...

BURNHAM HORIZONTAL BOILER-FEED OR HIGH-DUTY PUMPS

PISTON PATTERN

THESE PUMPS DO NOT SHORT STROKE

Sizes: 4x2½x5, 5x3x6, 5½x3½x7, 6½x4x8.

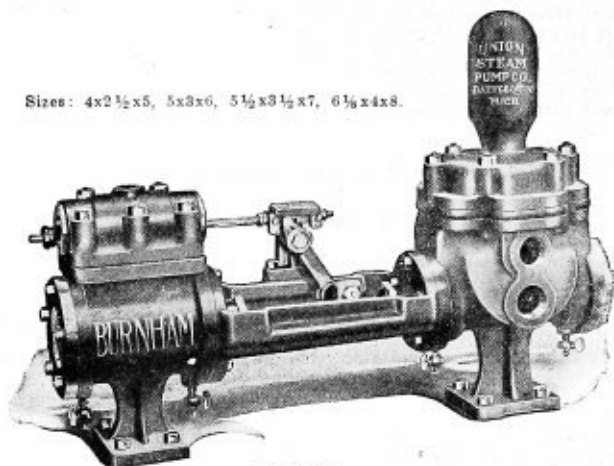


FIG. 980

Sizes: 10x6x12, 10x6½x12, 12x7x12,
12x7½x12, 12x8x12, 14x8x12, 14x8½x12.

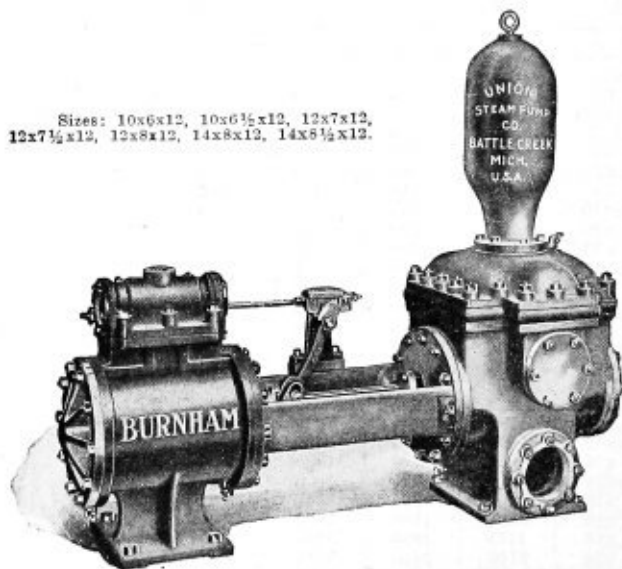


FIG. 981

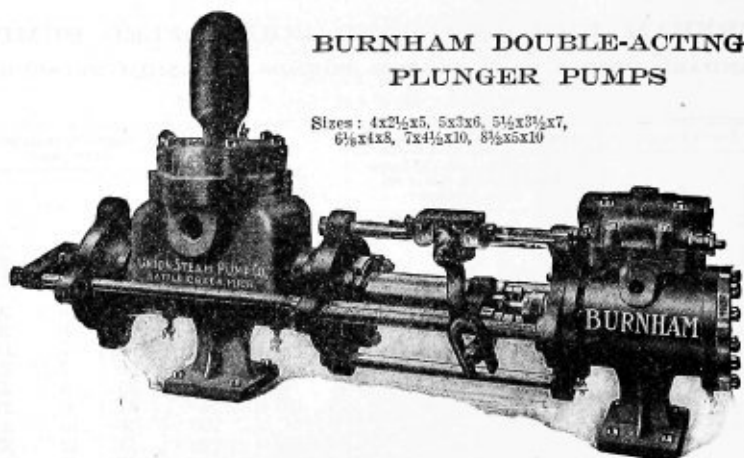
BURNHAM HIGH-DUTY AND BOILER-FEED PUMPS **STANDARD PISTON PATTERN. 150 POUNDS MAXIMUM PRESSURE**

Size of Pump			Diameter of Pump Opening				Gallons per Stroke	Horse-power of Boiler, Pump Will Feed at Speed Recommended	Dimensions in Inches, Approximate		
Diameter of Steam Cylinder	Diameter of Water Cylinder	Length of Stroke	For Long Pipe Lines Use Larger Pipes, Reducing Size at the Pump Openings						Length	Width	Height
			Steam	Exhaust	Suction	Discharge					
3	1 3/4	3	3/8	1/2	1 1/4	1	.031	25	21	6	20
3	2	3	3/8	1/2	1 1/4	1	.04	30	21	6	20
4	2 1/2	3 1/2	3/8	1/2	1 1/4	1	.074	45	26	7	18
4	2 1/2	5	3/8	1/2	1 1/4	1 1/4	.106	60	30	7	22
5	3	6	1/2	1	2	1 1/2	.183	100	35	8	25
5 1/2	3 1/2	7	1/2	1	2 1/2	2	.291	140	41	8	27
6 1/2	4	8	3/4	1 1/4	2 1/2	2	.44	200	47	10	30
7	4 1/2	10	3/4	1	3	2 1/2	.688	325	54	12	37
7	5	10	3/4	1	3 1/2	3	.85	400	59	15	45
8	5	12	1	1 1/2	3 1/2	3	1.02	485	66	15	45
8 1/2	5	10	1	1 1/2	3 1/2	3	.85	400	61	15	45
8 1/2	5 1/2	10	1	1 1/2	3 1/2	3	1.02	485	61	15	45
10	6	12	1 1/4	2	4	3	1.46	600	68	18	46
10	6 1/2	12	1 1/4	2	4	3	1.72	700	68	18	46
12	7	12	1 1/2	2 1/2	5	4	2.00	810	69	19	52
12	7 1/2	12	1 1/2	2 1/2	5	4	2.29	935	69	19	52
12	8	12	1 1/2	2 1/2	5	4	2.61	1060	72	22	60
12	7	16	1 1/2	2 1/2	5	4	2.66	1080	88	20	60
12	7 1/2	16	1 1/2	2 1/2	5	4	3.05	1250	88	20	60
12	8	16	1 1/2	2 1/2	6	5	3.48	1400	88	20	60
14	8	12	2	2 1/2	5	4	2.61	1060	72	22	60
14	8 1/2	12	2	2 1/2	6	5	2.94	1190	71	24	61
14	8	16	2	2 1/2	6	5	3.48	1400	95	20	61
14	8 1/2	16	2	2 1/2	6	5	3.93	1600	95	20	61
14	9	16	2	2 1/2	6	5	4.40	1800	96	24	65
16	10	16	2	2 1/2	8	6	5.44	2200	97	25	65
18	12	16	2 1/2	3 1/2	8	6	7.82	3175	104	29	91
20	14	16	2 1/2	3 1/2	10	8	10.66	4300	105	29	91
18	12	20	2 1/2	3 1/2	8	6	9.78	3915	116	29	91
20	14	20	2 1/2	3 1/2	10	8	13.32	5375	117	29	91
24	16	20	3	5	10	8	17.40	.....	121	37	100
26	18	20	3	5	12	10	22.00	.....	122	37	100
30	20	24	4	6	14	12	32.64	.....	130	42	128

We recommend that a boiler-feed pump should be run at a moderate speed. This prolongs the life of the pump and decreases the repair bill. For general service, such as handling cold water, the pump may run at a much higher speed. If the liquid handled is clear, cold water, the pump may run from 75 to 100 feet per minute. If the water is hot the pump must run more slowly, or if the suction lift is high, the pump should not be expected to run at maximum speed. In no case should the pump be expected to lift water by suction more than 22 feet, even when handling cold water.

*10x6 1/2 x12 pumps and smaller are suitable for use at 200 pounds pressure, per square inch.

In ordering pumps, refer to pages 347 to 349.



BURNHAM DOUBLE-ACTING PLUNGER PUMPS

Sizes: 4x2½x5, 5x3x6, 5½x3½x7,
6½x4x8, 7x4½x10, 8½x5x10

FIG. 982

Outside-end-packed. 150 pounds maximum water pressure.

Size of Pump			Diameter of Pump Openings				Gallons per Stroke	Horse-Power of Boiler Pump will Feed at Speed Recommended	Dim. in Inches, Approximate		
Diameter of Steam Cylinder	Diameter of Water Cylinder	Length of Stroke	For long pipe lines use larger pipes, reducing size at the pump openings						Length, Plunger in Extreme Position	Width	Height
			Steam	Exhaust	Suction	Discharge					
4	2½	5	½	¾	1½	1¼	.106	60	46	7	22
5	3	6	½	¾	2	1 ½	.183	100	55	9	26
5½	3½	7	½	¾	2½	2	.291	140	61	11	29
6½	4	8	¾	1	2½	2	.44	200	71	14	32
7	4½	10	¾	1	3	2½	.688	325	86	16	34
8½	5	10	1	1½	3½	3	.85	400	87	17	34
10	6	12	1¼	2	4	3	1.46	600	100	14	50
12	7	12	1½	2½	5	4	2.00	810	107	18	61
12	8	12	1½	2½	6	5	2.61	1060	108	19	65
14	8	12	2	2½	6	5	2.61	1060	108	19	65
14	9	16	2	2½	6	5	4.40	1800	136	21	83
16	10	16	2	2½	8	6	5.44	2200	137	21	83
18	12	16	2½	3½	8	6	7.82	3175	141	28	93
20	14	16	2½	3½	10	8	10.66	4300	141	28	93
24	16	20	3	5	10	8	17.40	7000	166	35	100
26	18	20	3	5	12	10	22.00	9000	166	35	100

We recommend that a boiler-feed pump should be run at a moderate speed. This not only gives the engineer a large reserve capacity should he have to force his boiler in case of emergency, but it prolongs the life of the pump and decreases the repair bill. For general service, such as handling cold water, the pump may run at a much higher speed. If the liquid handled is clear, cold water, the pump may run from 75 to 100 feet per minute. Under these conditions, the capacity of the pump can be readily ascertained by referring to table of capacities. If the water is hot, the pump must run more slowly; or if the suction lift is high, the pump should not be expected to run at maximum speed. In no case should the pump be expected to lift water by suction more than 22 feet, even when handling cold water.

In ordering pumps, refer to pages 347 to 349.

BURNHAM TANK OR LIGHT SERVICE PUMPS
LOW STEAM CONSUMPTION. BRONZE FITTED AT REGULAR PRICES

5x5x10

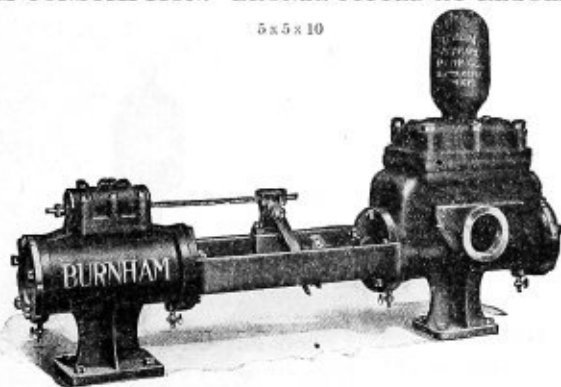


FIG. 983

This shows general design of the entire list, although larger sizes have flanged openings.

75 Pounds Maximum Water Pressure.

Size of Pump			Diameter of Pump Openings (For long pipelines use larger pipes, reducing size at the pump openings)				Gallons per Stroke	Strokes per Minute	Gallons per Minute at Given Number of Strokes	Gallons per Hour at Given Speed
Diameter of Steam Cylinder	Diameter of Water Cylinder	Length of Stroke	Steam	Exhaust	Suction	Discharge				
3	2 1/2	3	3/4	1 1/2	1 1/4	1	.0636	150	9.5	570
3	3	3	3/4	1 1/2	1 1/4	1	.0918	150	13.8	828
4	3	5	1 1/2	2 1/2	2	1 1/2	.1530	140	21.4	1264
4	6	5	1 1/2	2 1/2	3 1/2	4	.6115	140	85.5	5130
4 1/2	4	8	1 1/2	2 1/2	2 1/2	2 1/2	.4344	125	54	3240
5	3 1/2	6	1 1/2	2 1/2	2 1/2	2	.2496	125	31	1860
5	4	6	1 1/2	2 1/2	2 1/2	2	.3258	125	40.5	2430
5	5	6	1 1/2	2 1/2	3 1/2	3	.5094	125	63.5	3810
5	6	6	1 1/2	2 1/2	3 1/2	3 1/2	.7338	125	92	5520
5	5	10	1 1/2	2 1/2	3 1/2	3	.84	100	85	5100
5	8	10	1 1/2	2 1/2	5	4	2.17	100	217	13020
5 1/2	4	7	1 1/2	2 1/2	2 1/2	2	.3801	125	47.5	2850
5 1/2	7	7	1 1/2	2 1/2	5	4	1.1655	125	146	8760
6 1/2	5	8	1 1/2	2 1/2	3 1/2	3	.6792	125	85	5100
7	6	10	1 1/2	2 1/2	4	3 1/2	1.223	100	122	7320
7	8	10	1 1/2	2 1/2	5	4	2.175	100	217	13020
7	10	10	1 1/2	2 1/2	6	5	3.4	100	340	20400
8	8	12	1 1/2	2 1/2	5	4	2.61	100	261	15660
8	10	12	1 1/2	2 1/2	8	6	4.08	100	408	24480
8	12	12	1 1/2	2 1/2	8	6	5.8704	100	587	35220
8 1/2	7	10	1 1/2	2 1/2	5	4	1.665	100	166	9990
8 1/2	8	10	1 1/2	2 1/2	5	4	2.175	100	217	13020
8 1/2	10	10	1 1/2	2 1/2	6	5	3.4	100	340	20400
10	10	12	1 1/2	2 1/2	8	6	4.08	100	408	24480
10	12	16	1 1/2	2 1/2	8	6	7.8272	75	587	35220
12	8	12	1 1/2	2 1/2	5	4	2.61	100	261	15660
12	12	12	1 1/2	2 1/2	8	6	5.8704	100	587	35220

In ordering pumps, refer to pages 347 to 349.

BURNHAM OUTSIDE-CENTER-PACKED PLUNGER PUMPS

Sizes: 6½x4x12 to 14x9x16

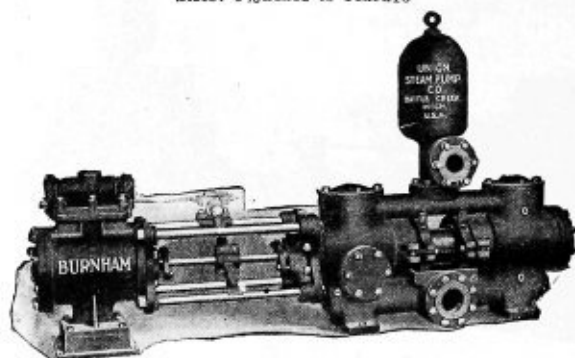


FIG. 984

Water cylinders on pumps up to 14x9x16 are cast in one piece. Larger sizes have water cylinder cast in two duplicate halves, securely bolted.

180 Pounds Maximum Water Pressure.

Size of Pump			Diameter of Pump Openings For long pipe lines use larger pipes, re- ducing size at the pump openings				Gallons per Stroke	Horsepower of Boiler Pump will Feed at Speed Recommended	Type of Water Cylinder
Diameter of Steam Cylinder	Diameter of Water Cylinder	Length of Stroke	Steam	Exhaust	Suction	Dis- charge			
6½	4	8	¾	1	2½	2	.44	200	1-pc.
6½	4	12	¾	1	3	2½	.65	260	1-pc.
7	4½	10	¾	1	3	2½	.688	325	1-pc.
8	5	12	1	1½	3½	3	1.01	415	1-pc.
10	6	12	1¼	2	4	3	1.46	600	1-pc.
12	7	12	1½	2½	5	4	2	810	1-pc.
12	8	12	1½	2½	5	4	2.61	1060	1-pc.
12	8	16	1½	2½	6	5	3.48	1400	1-pc.
14	8	16	2	2½	6	5	3.48	1400	1-pc.
14	9	16	2	2½	6	5	4.40	1800	1-pc.
16	10	16	2	2½	8	6	5.44	2200	2-pc.
16	10½	16	2	2½	8	6	6	2400	2-pc.
16	10	20	2	2½	8	6	6.80	2750	2-pc.
16	10½	20	2	2½	8	6	7.49	3000	2-pc.
18	12	16	2½	3½	8	6	7.82	3175	2-pc.
18	12	20	2½	3½	8	6	9.78	3915	2-pc.
20	14	20	2½	3½	10	8	13.32	5375	2-pc.
24	16	20	3	5	10	8	17.4	7000	2-pc.
26	18	20	3	5	12	10	22	9000	2-pc.
26	18	24	3	5	12	10	26.42	10575	2-pc.
30	20	24	4	6	14	12	32.64	13000	2-pc.

In ordering pumps, refer to pages 347 to 349.

BURNHAM PUMP PARTS

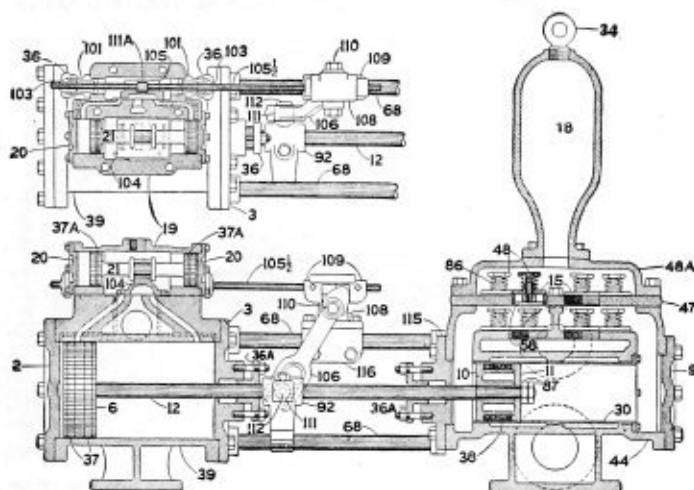


FIG. 985

SECTIONAL VIEW OF BURNHAM PUMP WITH STEEL TIE-ROD YOKE

PISTON PATTERN

NUMBER AND NAME OF PART

39	Steam Cylinder.	103	Auxiliary Valve Stem Stuffing Box Glands.
2	Outside Steam Cylinder Head.	3	Inside Steam Cylinder Head (for Yoke).
6	Steam Piston.	115	Water Cylinder Head for Yoke Rods.
19	Steam Valve Chest.	36A	Piston Rod Glands.
21	Steam Chest Piston.	68	Tie Rods.
37A	Steam Chest Rings.	44	Water Cylinder.
37	Steam Cylinder Rings.	9	Water Cylinder Head.
104	Main Slide Valve.	47	Water Valve Plate.
105	Auxiliary Slide Valve.	48A	Water Cylinder Hood.
92	Piston Rod Guide.	18	Air Chamber.
108	Standard for Actuating Lever.	10	Water Piston Head.
109	Right and Left Cam Blocks on Valve Stem.	11	Water Piston Follower.
106	Actuating Lever.	30	Water Cylinder Lining.
116	Clamp to Hold Standard for Actuating Lever.	34	Air Chamber Plug.
105½	Auxiliary Valve Stem.	15	Water Valves.
111A	Collar on Valve Stem.	58	Water Valve Seats.
110	Actuating Lever Stud.	48	Water Valve Bolts.
112	Piston Rod Guide Stud.	86	Water Valve Springs.
111	Piston Rod Stud Collar.	12	Piston Rod.
20	Steam Valve Chest Heads.	87	Water Piston Jam Nuts.
101	Auxiliary Valve Stem Stuffing Boxes.	38	Water Piston Packing.
36	Auxiliary Valve Stem Stuffing Box Nuts.		

N. B.—Always give Shop Number of Pump.

BURNHAM HYDRAULIC-PRESSURE PUMPS

WITH CAST-IRON WATER CYLINDERS

Showing 4½x1x8 up to 10x1½x12



FIG. 986

Size of Pump			Diameter of Pipe Openings (For long pipe lines use larger pipes, reducing size at the pump openings)				Strokes per Minute	Gallons per Minute	*Balanced Pressure at 85 lbs. of Steam	Maximum Pressure for Cast Iron Cylinders
Diameter of Steam Cylinder	Diameter of Water Cylinder	Length of Stroke	Steam	Exhaust	Suction	Dis-charge				
8½	1½	10	1	1½	1¼	1	120	6.37	3530	2000
8½	1½	10	1	1½	1¼	1	120	7.71	2920	2000
8½	1½	10	1	1½	1¼	1	120	9.18	2450	2000
8½	1½	10	1	1½	1¼	1	120	10.77	2090	2000
8	1½	12	1	1½	1¼	1	100	6.37	3130	2000
8	1½	12	1	1½	1¼	1	100	9.18	2170	2000
8	1½	12	1	1½	1¼	1	100	12.49	1600	2000
8	2	12	1	1½	1¼	1	100	16.31	1200	2000
8	2½	12	1	1½	1½	1¼	100	25.49	800	2000
10	1½	12	1¼	2	1¼	1	100	9.18	3400	2000
10	1½	12	1¼	2	1¼	1	100	12.49	2500	2000
10	2	12	1¼	2	1¼	1	100	16.31	1910	2000
10	2½	12	1¼	2	1½	1¼	100	25.49	1200	2000
12	1½	12	1½	2½	1¼	1	100	9.18	4890	2000
12	1½	12	1½	2½	1¼	1	100	12.49	3590	2000
12	2	12	1½	2½	1¼	1	100	16.31	2750	2000
12	2½	12	1½	2½	1½	1¼	100	25.49	1760	2000
14	1½	12	2	2½	1¼	1	100	12.49	4900	2000
14	2	12	2	2½	1¼	1	100	16.31	3750	2000
14	2½	12	2	2½	1½	1¼	100	25.49	2400	2000

When pressure regulator is wanted, one can be furnished at small additional cost.

*These balanced pressures are figured for use with steam pressure at 85 pounds per square inch.

In ordering pumps, refer to pages 347 to 349.

BURNHAM DEEP-WELL ENGINES

Showing Type of 5 x 10



FIG. 987

All 5- and 6-inch steam cylinders have regulating plugs to be handled by ordinary wrenches; 8-inch steam cylinders and larger have regulating plugs provided with hand-wheels.

Showing Type of 6 x 16 up to 6 x 36, inclusive

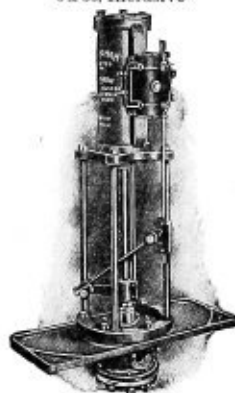


FIG. 988

Size of Engine		Diameter of Engine Openings			††Size of Plunger Rod Connection	Dimensions in Inches, Approximate			Shipping Weight, Approximate
Diameter of Steam Cylinder	Length of Stroke	For Long Pipe Lines Use Larger Pipes, Reducing Size at the Engine Openings				Length	Width	Height Above Floor	
		Steam	Exhaust	Pipe Size of Well Connection					
5	10	3/4	1	2 1/2	3/4 pipe	11	11	40	250
6	16	3/4	1	6	1 1/2	34	14	50	500
6	24	3/4	1	6	1 1/2	34	14	67	580
6	36	3/4	1	6	1 1/2	34	14	96	650
8	24	1	1 1/2	8	1 1/2	40	17	70	950
8	36	1	1 1/2	8	1 1/2	40	17	99	1150
10	24	1 1/2	2	8	1 1/2	41	18	70	1200
10	36	1 1/2	2	8	1 1/2	41	18	98	1300
12	36	1 1/2	2 1/2	8	1 1/2	52	20	96	1700
14	36	2	2 1/2	†8	1 3/4	56	21	98	2300
16	42	2	2 1/2	†8	1 3/4	64	32	112	3150
18	42	2	3	†8	2	64	32	112	3450

*Well connection opening is tapped for 2 1/2-inch pipe in the base of deep-well head; all other sizes are furnished with companion flanges.

†10-inch opening may be furnished on request.

††All plunger-rod connections are threaded eight threads to the inch, unless otherwise ordered, excepting 5x10, which is 3/4 pipe thread.

NOTE.—We are prepared to furnish, if desired, water cylinders to be used with deep-well pumping engines, sizes and styles to suit requirements of each individual well. But as no two are alike, we must know the full particulars in each and every case, in order to intelligently recommend an outfit.

Figure No. 988 shows displacement plunger for which an extra charge is made when furnished.

In ordering pumps, refer to pages 347 to 349.

UNION POWER DEEP - WELL ENGINES

For use in places where belt, electric-motor or gas-engine drive is more desirable than steam.

These engines are constructed along lines of the best engine practice. Special attention is called to the three essential features below.

Main Frame.—One-Piece Casting. Not an assemblage of small parts weakly bolted together.

Gears.—All machine-cut from solid blanks; Steel Pinions. All Gears thoroughly guarded. Ratio six to one.

Inspection of Well Cylinder.—Base plates are so arranged that by swinging the pump-head to one side the well-rod and lower cylinder parts can be drawn up through discharge chamber without disturbing any pipe connections.



FIG. 989

CODE WORD	Size and H. P. Motor or Engine Required	Approximate Shipping Weights	Capacity				Diameter Well/Cylinder	Pipe Sizes Regularly Furnished			Pulleys		Approximate Dimensions, in Inches	
			Speed, R. P. M. for Various Lifts	Gallons per Minute	Gallons per Hour	Extreme Lift in Feet		Use Bushings if Smaller Sizes are Required			Regular Size	Special Large Size for Motor Drive	Founda- tion Space	Height above Foundation
								Drop Pipe Well Casing	Dis- charge Pipe to Tank					
Fibob...	6-in. Stroke 1 H. P.	275 pounds	50	9.18	550	100	3							
			50	7.71	462	120	2 3/4							
			45	5.71	342	150	2 1/2							
			45	4.64	278	175	2 1/4	3 1/2	1 1/2	10x2 1/2	18x2 1/2	16x16	20	
			40	3.26	196	200	2							
			40	2.50	150	250	1 3/4							
Fibap...	8-in. Stroke 2 H. P.	400 pounds	50	14.36	862	140	3 1/4							
			50	12.24	734	200	3							
			45	9.25	555	250	2 3/4							
			45	7.63	458	300	2 1/2	4	2	12x3	24x3	18x18	40	
			40	5.50	330	350	2 1/4							
			40	4.34	260	400	2							
Fidem...	10-in. Stroke 2 H. P.	450 pounds	45	24.43	1466	75	4							
			45	21.46	1287	90	3 3/4							
			40	12.24	734	140	3							
			40	8.48	508	200	2 1/2	4	2	12x3	24x3	20x20	42	
			35	6.02	361	240	2 1/4							
			30	4.08	245	275	2							
Fidmo...	12-in. Stroke 3 H. P.	700 pounds	40	26.06	1564	150	4							
			40	22.50	1350	175	3 3/4							
			40	14.69	881	275	3							
			35	8.90	534	400	2 1/2	6	3	20x4	30x4	18x24	60	
			35	7.21	432	450	2 1/4							
			30	4.90	294	500	2							
			30	3.74	224	600	1 3/4							

Extreme Lift means Vertical Distance from Level of Water in well to point of Discharge.

Pumps are furnished with tight pulley only. Slight additional charge for loose or special pulleys. The ratings shown above may be considerably increased if required.

*If the Power Head is to be used with these sizes of working barrels, a special base plate must be ordered with extra large hole so that the well plunger may be withdrawn. This involves a slight additional charge.

In ordering pumps, refer to pages 347 to 349.

UNION DUPLEX POWER PUMPS

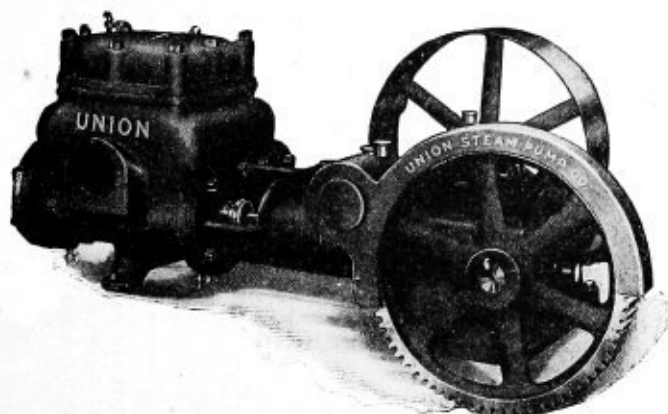


FIG. 990

6x6 Belt-Driven Union General-Service Pumps

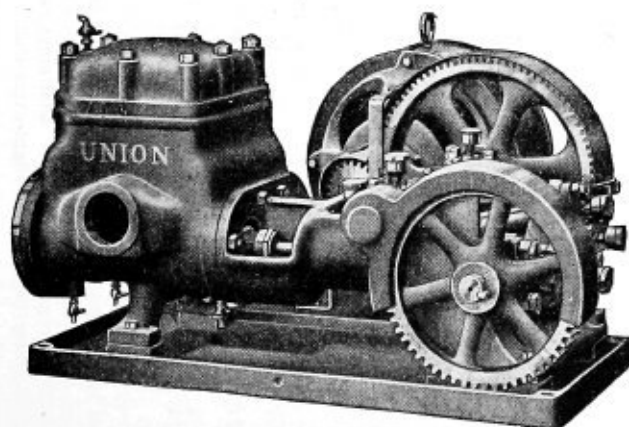


FIG. 991

6x6 Motor-Driven Union Duplex Power Pump, Packed-Piston Pattern,
for General Service.

A Base-Plate is provided for motor-driven pumps on which both pump and motor are located.

For sizes see following page.

PACKED-PISTON PATTERN, UNION DUPLEX POWER PUMPS FOR GENERAL SERVICE

*CODE WORD Belt-Driven	Size		Maximum Water Pressure	Revolutions per Minute	Capacity			Pipe Openings		Pulleys			Approximate Dimensions in inches			Approximate Shipping Weight, in Pounds
	Diameter Water	Stroke			Revolutions per Minute	Gallons per Minute	Extreme Height in Feet to Pump Against	Section	Discharge	Diameter	Width	Single or Double	Length	Width	Height	
Dixol.....	2 1/2	4	150	75	34	25	346	11 1/2	1 1/2	16	3	S	34	24	17	500
Dixar.....	2 3/4	4	125	75	41	30	290	11 1/2	1 1/2	16	3	S	34	24	17	520
Dixon.....	3	4	110	75	49	36	254	11 1/2	1 1/2	16	3	S	36	24	19	550
Dixif.....	3 1/2	4	100	75	66	50	230	11 1/2	1 1/2	16	3	S	36	24	19	570
Dixum.....	4	4	100	75	87	66	230	12 1/2	2 1/2	18	3 1/2	S	37	24	19	600
Dixro.....	4 1/2	4	90	75	110	82	28	12 1/2	2 1/2	18	3 1/2	S	38	24	19	650
Dixal.....	4 3/4	4	75	75	122	92	173	12 1/2	2 1/2	18	3 1/2	S	40	24	19	700
Dixbi.....	5 1/4	6	100	60	184	110	230	12 1/2	2 1/2	24	5	D	53	32	23	1000
Dixpan.....	5 1/2	6	90	60	204	122	288	12 1/2	2 1/2	24	5	D	53	32	23	1080
Dixru.....	5 3/4	6	80	60	246	148	185	12 1/2	2 1/2	24	5	D	53	32	23	1100
Dixcap.....	5 3/4	6	70	60	269	161	160	12 1/2	2 1/2	24	5	D	55	32	23	1150
Dixdom.....	6	6	60	60	293	175	140	12 1/2	2 1/2	24	5	D	55	32	23	1200

Valve seats are of bronze and screwed into decks; valve bolts, valve covers and springs are of bronze; valves of hard or soft rubber, or brass, as service may require. Bronze water-cylinder lining, bronze stuffing-boxes, glands and nuts, and bronze rods are furnished as regular equipment. Additional charge is made for bronze water-pistons. Tight pulley is regular equipment; loose pulley furnished at slight extra cost.

*If a geared Motor-Driven pump is desired, add the ending "tric" to the code word.

In ordering pumps, refer to pages 347 to 349.

UNIQUE POWER PUMPS

This Outfit will pump 20,000 gallons of water into a tank 50 feet high using approximately one gallon of gasoline.

Why Endure the Drudgery of Hand Pumping?

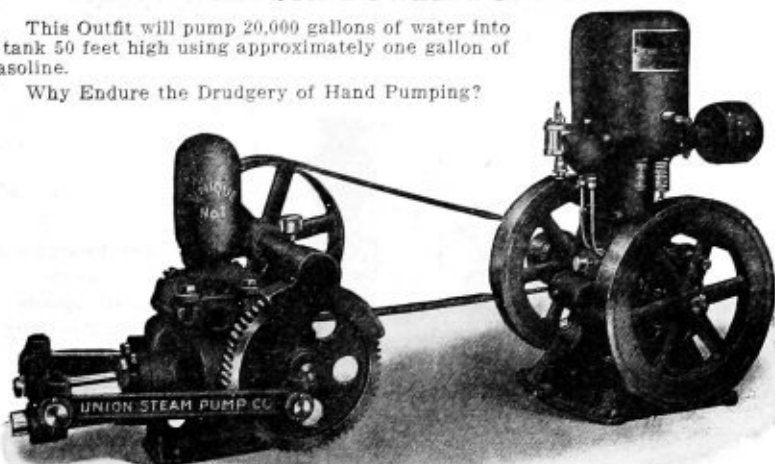


FIG. 392

Unique Power Pump Connected to a Gasoline Engine
 Sizes, Capacities and H. P. of Unique Pumps. For 350 feet lift above pump.
 We recommend 18 feet as the practical limit for
 suction lift of any pump

CODE WORD	Size No.	SIZE OF PUMP	Weight, in pounds	Speed R. P. M.	Gallons per Minute	Gallons per Hour	H. P. Recommended for 350 ft. lift	Pulley Bolt	Suction Pipe	Discharge Pipe	Gear Ratio
Lonfi.....	1	2 x 4	150	60	6.5	390	1	9 x 2	1	1	1 to 1
Longu.....	2	2½ x 5	225	50	10.6	636	1½	12 x 2½	1¼	1¼	
Lonib.....	3	3 x 5	290	50	15.3	918	2	12 x 2½	1½	1½	
Lonol.....	4	4 x 5	300	50	27.1	1629	3	16 x 3	2	2	
Lopna.....	5	5 x 5	400	50	42.5	2547	5	16 x 3	2	2	

Fully Brass Fitted. Tight and Loose Pulleys regularly furnished. For installations requiring greater capacities we recommend our Duplex Power Pumps

Pump and Power Frame combined in one casting. No "Bolted on" Brackets to work loose.

Brass-Lined Cylinders.—Bronze Piston-Rods.

Brass Wing-Valves with Bevel Seats easily reached for inspection by removing four nuts, and lifting air chamber. No piping disturbed.

Removable Brass Valve Seats.

Water-Piston packed with cup leathers.

Brass Stuffing-Box, Gland and Nut.

Suction Valves above piston—pump always primed.

Suction and Discharge on both sides of pump.

Cut Gears—Steel Pinions—Completely guarded.

Extra Heavy Crank-Shaft—Straight Side-Rods—Will not spring.

Perfect Alignment insured by one Extra Large Crosshead Support. Main-Shaft Bearing Babbitted. Adjustable Cap. Gear-shaft Bearings have removable bushings quickly and cheaply renewed.

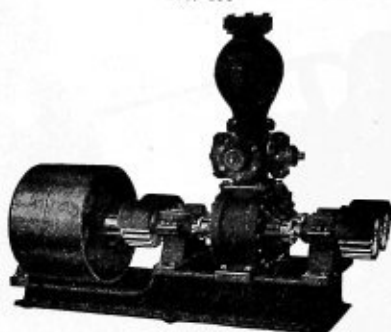
In ordering pumps, refer to pages 347 to 349.

RUMSEY POWER ROTARY FORCE PUMPS

FOR WATER SUPPLY AND FIRE PROTECTION

No. 199

For Pressures
of up to 75 pounds
for
General Service



For Pressures of
up to
100 pounds
for Fire Duty

FIG. 993

No. 199 is designed for water supply, fire protection, handling oils or special liquids and for general pumping in mills and factories wherever a moderate priced pump of large capacity is desired.

The cams are of the most effective pattern with the ends of the teeth packed with bronze blocks, which secure a high vacuum and take up the wear. Glands are brass. Shafts are unusually large, run in extra long babbitted bearings and operate with two pairs of heavy gears to relieve the cams.

Discharge is arranged for pipe and hose and the arrangement can be varied to order to suit requirements.

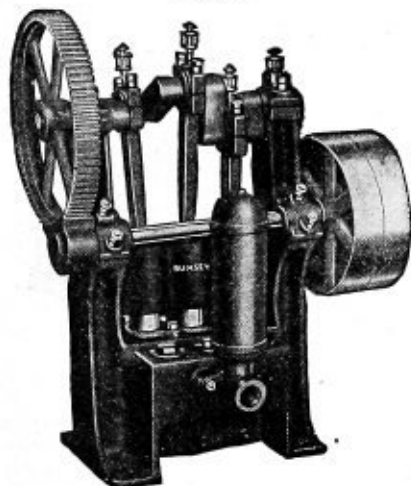
Pulley sizes are suitable for general service under moderate pressure. For heavy service the three larger sizes are supplied with single broad face pulley or with short bed plate, outboard bearing and tight and loose pulleys.

Bronze pumps, pumps with short bed plate and jaw clutch, or electric-driven pumps, may be supplied to order and will be quoted on inquiry.

No.	General Service		Fire Duty		Suction Pipe In.	Discharge		Number of Fire Streams	Pulleys Inches	Iron List	Bronze Case and Cams List
	Usual Speed and Capacity per Minute		Usual Speed and Capacity per Minute			Pipe In.	Hose In.				
	R.P.M.	Gal.	R.P.M.	Gal.							
1	100	29	350	100	2	2	2	1	14 x 4½	\$125.00	\$ 170.00
2	100	43	350	150	2½	2½	2	1	16 x 5½	140.00	210.00
3	100	87	350	300	3	3	2½	2	18 x 6½	200.00	320.00
4	100	168	300	500	5	4	2½	2	20 x 8½	290.00	490.00
5	100	270	280	750	6	6	2½	3	24 x 8	375.00	625.00
6	75	342	220	1000	8	8	2½	4	28 x 9	600.00	1000.00

RUMSEY SINGLE-ACTING TRIPLEX PLUNGER PUMP

No. 681



For Pressures
ranging from 120
to 150 pounds,
see Table

For Elevations
ranging from 275
to 350 feet,
see Table

FIG. 994

No. 681 is designed for tank pumping, boiler feeding and special service in industrial plants of all kinds. This pump is of standard construction throughout and fully guaranteed. It is highly recommended as a pump which will give long life and satisfactory service.

All working parts are readily accessible. Gearing is machine cut. Bearings are babbitted. Plungers are outside guided and outside packed. Valves for hot water are supplied to order. Pumps may be bronze fitted to order at extra price.

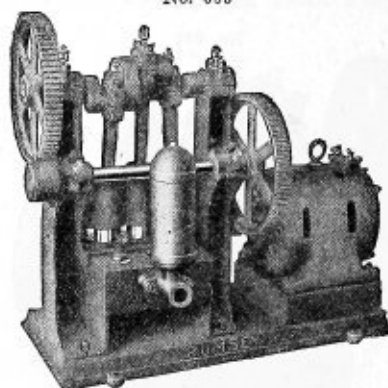
Plungers Diam. x Stroke Inches	Capacity per Min. at 40 to 60 Rev. Gallons	Working Pressure Pounds*	Pipe Sizes		Size Puller Inches	List
			Suction Inches	Discharge Inches		
1¼ x 2	1.2 to 1.8	150	1	¾	12 x 1½	\$ 50.00
1¼ x 3	3.6 to 5.4	150	1	1	12 x 2	73.00
2 x 3	4.8 to 7.2	130	1¼	1¼	12 x 2	78.00
2¼ x 4	8. to 12.	150	1¼	1¼	12 x 2½	115.00
2½ x 4	10. to 15.	150	1¼	1¼	12 x 2½	120.00
3 x 4½	16. to 24.	150	1½	1½	15 x 2½	155.00
3½ x 4½	20. to 30.	150	1½	1½	15 x 2½	160.00
3½ x 5	25. to 37.	150	2	2	20 x 3	215.00
4 x 6	40. to 60.	150	2½	2	20 x 4	255.00
4½ x 6	49. to 74.	120	3	2½	20 x 4	260.00
5 x 6	61. to 91.	150	3	3	24 x 5	400.00
5½ x 6	74. to 111.	120	3	3	24 x 5	415.00

*One pound pressure is equivalent to 2.31 feet head. Gear ratio 5 to 1.

RUMSEY ELECTRIC TRIPLEX PLUNGER PUMP

No. 683

For Pressures
ranging from 120
to 150 pounds,
see Table



For Elevations
ranging from 275
to 350 feet,
see Table

FIG. 995

No. 683 is particularly adapted for tank pumping in private homes, office buildings and hotels, as well as for general service. It operates smoothly and quietly and requires but little attention. It may be arranged with single electric controlling devices to automatically maintain water in tanks at fixed levels.

This outfit includes pump, bed-plate, intermediate gear and rawhide motor pinion, all complete, ready to receive electric motor. Motor is not included but may be furnished to order at extra price.

Table shows power for moderate heads. These pumps are also furnished for use with larger motors for heavier duty. (See table No. 681.)

Plungers Diam. x Stroke Inches	Capacity per Hour Gallons	Usual Size of Motor		Pipe Sizes		List Ready to Receive Motor
		For Elevation in Feet*	Select Motor of H. P.	Suction Inches	Discharge Inches	
1½ x 2	90	300	¼	1	¾	\$ 70.00
1¾ x 3	270	200	½	1	1	95.00
1¾ x 3	270	350	1	1	1	95.00
2 x 3	360	100	½	1¼	1¼	100.00
2¼ x 4	600	100	¾	1¼	1¼	145.00
2½ x 4	750	100	1	1¼	1¼	150.00
3 x 4½	1200	100	1¼	1½	1½	185.00
3½ x 4½	1500	100	1½	1½	1½	190.00
3½ x 5	1800	100	1½	2	2	270.00
4 x 6	3000	100	2½	2½	2	330.00
4½ x 6	3720	100	3½	3	2½	335.00
5 x 6	4590	100	5	3	3	490.00
5½ x 6	5550	100	5	3	3	505.00

*2.31 feet head is equivalent to one-pound pressure.

RUMSEY TRIPLEX PUMPS FOR BOILER FEEDING

Showing By-Pass, Relief Valve and Discharge Check Valve, attached to Triplex Pump.

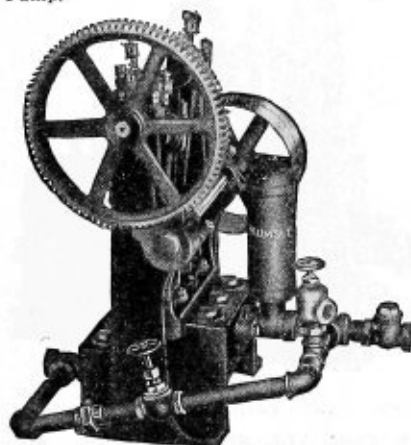


FIG. 996

The single-acting triplex pump is unsurpassed for boiler feeding, because of its high efficiency and economy, steady delivery and adaptability for ready control of the quantity of water discharged. To secure a variation in the capacity to meet the actual requirements, which may vary, we recommend the use of a by-pass, as shown in the illustration, consisting of piping from the discharge to the suction and check, relief and gate valves. By regulating the gate valve, the delivery may be controlled to a nicety, the surplus feed water being returned to the source of supply; and by setting the automatic relief valve at a pressure slightly above that of the boilers, the possibility of excessive pressure damaging the pump is eliminated. Any of our triplex pumps may be equipped in this manner; and we also bronze-fit them, when so ordered, at an extra price.

Boiler feed pumps should run slower than for ordinary duty, and hot water must flow to the pump. The annexed table gives approximately the proper selection of pumps for this service; although the speeds may be altered to suit intermediate sizes of boilers, or to meet varying conditions. Recommendations for larger sizes of boilers will be made upon request. In making inquiry always state the horsepower of boilers, boiler pressure, whether the pump is to handle hot or cold water and the number of hours per day the pump will run.

Rated Capacity of Boiler, H. P.	Pump Plungers Diameter Stroke, Inches	Capacity of Pump per Minute, Gallons	Speed of Pump per Minute, Revolutions	Size of By-Pass, Inches
50	1 $\frac{3}{4}$ x 3	3.5	39	$\frac{3}{4}$
100	2 $\frac{1}{4}$ x 4	7.	35	1
150	3 x 4	10.5	30	1
200	3 x 4 $\frac{1}{2}$	14.	35	1 $\frac{1}{4}$
250	3 $\frac{1}{2}$ x 5	18.	30	1 $\frac{1}{4}$
300	3 $\frac{1}{2}$ x 5	21.	34	1 $\frac{1}{4}$
400	4 x 6	28.	28	1 $\frac{1}{2}$
500	4 $\frac{1}{2}$ x 6	36.	29	1 $\frac{1}{2}$
600	5 x 6	41.	27	1 $\frac{1}{2}$
700	5 x 6	47.	31	1 $\frac{1}{2}$
800	5 x 8	53.	26	1 $\frac{1}{2}$
900	5 $\frac{1}{2}$ x 8	62.	25	1 $\frac{1}{2}$
1000	5 $\frac{1}{2}$ x 8	69.	28	1 $\frac{1}{2}$
1100	6 x 8	73.	25	2
1200	6 x 8	82.	28	2
1500	6 $\frac{1}{2}$ x 10	103.	24	2 $\frac{1}{2}$
1800	6 $\frac{1}{2}$ x 10	120.	28	2 $\frac{1}{2}$
2000	7 $\frac{1}{4}$ x 10	134.	25	2 $\frac{1}{2}$
2200	7 $\frac{1}{4}$ x 10	150.	28	2 $\frac{1}{2}$
2500	8 x 10	170.	26	2 $\frac{1}{2}$
3000	9 x 10	206.	25	3

RUMSEY TRIPLEX POWER PUMPS

No. 691

No. 691—Electric-Driven

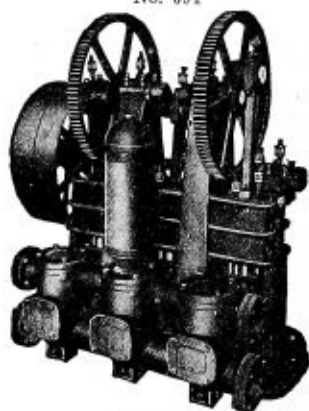


FIG. 997

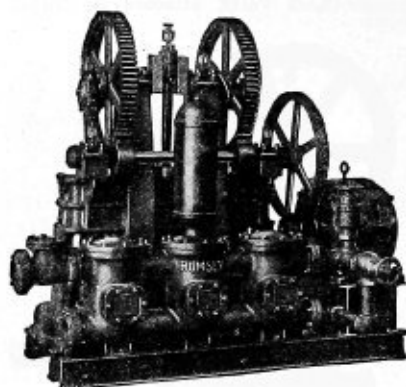


FIG. 998

We offer a complete line of belt-driven, electric, gas or gasoline-driven

TRIPLEX POWER PUMPS FOR ALL SERVICES

For Water Supply.

For Fire Duty.

For Boiler Feeding.

For Circulating.

For Hydraulic Elevators.

For Pumping Chemicals.

For Exerting Pressures.

For Condensers.

For Oil Refineries.

For Railroad Tanks.

For Mine Service.

For Special Liquids.

Inquiries should state fully the conditions under which the pump is to operate. Recommendations will be made and prices quoted for a pump suitable for any requirements. A sketch showing the relative position of supply, pump and discharge point with dimensions, and giving the length, size and turns or bends of pipe line will be a great aid to an intelligent understanding of your needs.

Rumsey No. 798
16x16-inch Triplex
Power Pump,
mounted on Sub-
base with 150 H.
P. Motor. Capacity
over a million gal-
lons a day.

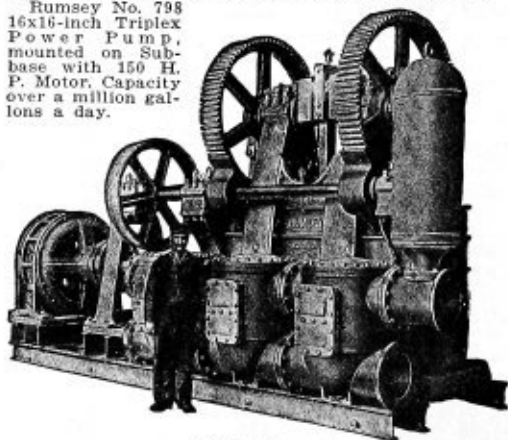


FIG. 999

AMERICAN CENTRIFUGAL PUMPS

TYPE A. LOW PRESSURE, SINGLE STAGE, HORIZONTAL, BELT DRIVEN, CENTRIFUGAL PUMP, FOR TOTAL HEAD UP TO 65 FEET

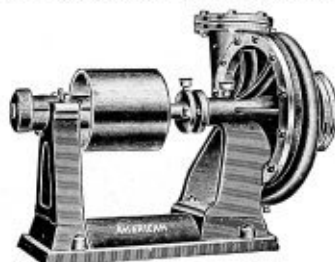


FIG. 1000

Economical Capacity per Min. in U. S. **Gals.			Pump No. and Diam. Discharge in Inches	Diam. Suction in Inches	Weight Iron	
					Domestic	Export
10	30	35	1c	1 1/4	45	60
30	55	80	1 1/4 c	1 1/2	115	140
40	75	150	1 1/2 c	2	125	150
60	125	195	2	2 1/2	145	170
110	200	385	2 1/2	3	215	260
135	265	470	3	4	230	275
225	410	720	3 1/2	5	360	420
250	500	845	4	6	380	440
350	750	1200	5	7	680	790
400	900	1350	6	8	725	1440
600	1550	2200	7	9	950	1490
800	1600	2600	8	10	1280	1520
1100	2600	3950	10	12	2045	2400
1500	4000	5800	12	15	2420	2810
2900	6000	8800	15	15	3040	3500
4500	10000	14000	18d	18	5320	6150
6100	13500	18500	20d	20	7200	8280
7500	16500	22000	24d	24	11400	13200

Horse power required per foot of lift depends upon quantity of water and head.

Pumps are also made all brass, or brass fitted as required, at an advance in price.

An all brass pump consists of Brass Volute, Cover, Runner, Shaft, Gland and Flanges, the balance of pump being Iron. A Brass Fitted pump consists of Brass Shaft and Gland, the balance of pump being iron.

(c) Nos. 1, 1 1/4 and 1 1/2 Pumps have screwed connections. Nos. 2 to 15 inclusive are provided with companion flanges on both suction and discharge. They are regularly threaded for standard pipe, but will be fitted for oil well casing thread on request at a slight advance in price. No. 18 and larger pump flanges will be drilled either for standard or for spiral riveted pipe flanges; but no companion flanges are furnished.

(d) Has Bracket Box on each side of pulley, both covers flanged and bolted to each side of volute.

Motor driven pumps operating on an open or closed tank system may be arranged to stop and start automatically as required, by means of automatic devices, which we can furnish when desired.

- (b) {An American gallon contains 231 cubic inches, weighs 8.3356 pounds.
 {An Imperial gallon contains 277.274 cubic inches, weight 10 pounds.

BARNES FRICTIONLESS DIAPHRAGM PUMPS BOTTOM SUCTION

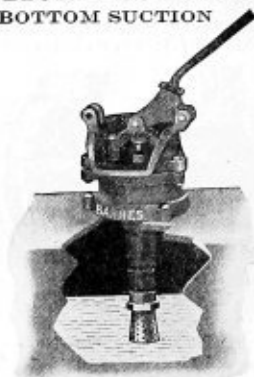


FIG. 1001

For handling a large quantity of water with the minimum of labor no other hand pump compares with the Diaphragm Pump. It will successfully handle anything of a liquid nature and is used very largely by contractors and others for handling muddy or gritty water, quicksands, sewage, etc.

	Suction Fitted for Pipe	Approx. Cap. Per Hour	Price Each
No. 1.....	2½ inch	1500 Gallons	\$18.00
No. 2.....	3 inch	3500 Gallons	24.00
No. 3.....	4 inch	6000 Gallons	37.00

SIDE SUCTION



FIG. 1002

The above pump is similar in construction to pump shown at top of page except is provided with side suction.

The outfits listed below include Hose Bands, Galvanized Suction Strainer and Brass Couplings for connecting hose to pump and to strainer.

Brass Strainer can be furnished, when so ordered, at an extra charge.

	Suction fitted for Pipe and Size Hose fur- nished when ordered	Approximate capacity per hour	Pump only no Hose or Trimings	Pump with 12 feet Hose and Trimings	Pump with 15 feet Hose and Trimings	Pump with 20 feet Hose and Trimings
No. 1.....	2½-inch	1500 gals.	\$20.00	44.00	48.00	56.00
No. 2.....	3 -inch	3500 gals.	26.00	58.00	64.00	74.00
No. 3.....	4 -inch	6000 gals.	48.00	105.00	116.00	134.00

BARNES ANTI-SPLASH POWER DIAPHRAGM PUMPING OUTFITS

GUARANTEED TO DELIVER 5,000 TO 19,000 GALLONS PER HOUR
WITHOUT A SPLASH

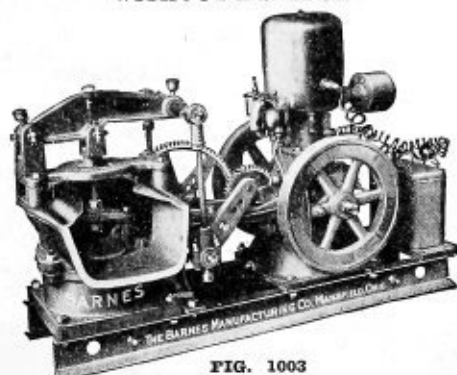


FIG. 1003

Single unit mounted upon Frame. Also furnished on Steel Trucks if desired.

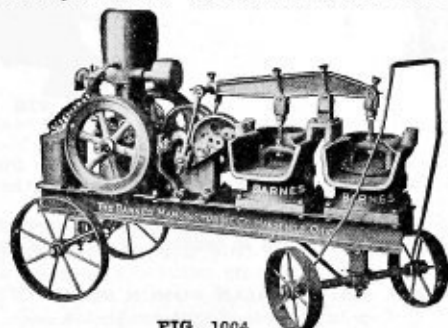


FIG. 1004

Twin units mounted upon Steel Truck.

SPECIFICATIONS

Outfit Number	Engine H. P.	Pump Size Suction	Capacity Gallons per hour	Weight, Pounds
1	1½	3 ins.	4,000 to 5,000	575
1D	2	3 ins.	4,000 to 5,000	725
2	2	4 ins.	8,500 to 9,500	840
2D	3	4 ins.	8,500 to 9,500	920
3	2	Two 3 in.	8,000 to 10,000	950
3D	3	Two 3 in.	8,000 to 10,000	1,000
4	3	Two 4 in.	17,000 to 19,000	1,200
4D	4	Two 4 in.	17,000 to 19,000	1,320

NOTE—In the table of capacities the smaller figure is the capacity at a 15 ft. lift; the larger at a 5 ft. lift. If suction lift is more than 15 feet use a foot valve. All outfits mounted on steel trucks if desired.

SUCTION HOSE, ETC. We also have in stock a complete line of suction hose; brass hose couplings; strainers, with and without foot valve, both galvanized and black hose bands, enabling us to ship a complete outfit.

BARNES NEW IMPROVED "MOHICAN" DOUBLE-ACTING HORIZONTAL FORCE PUMPS

FOR USE ON SHIPBOARD, WHARVES, AROUND FACTORIES, MILLS
AND IN RESIDENCES FOR DOMESTIC WATER SUPPLY



FIG. 1005

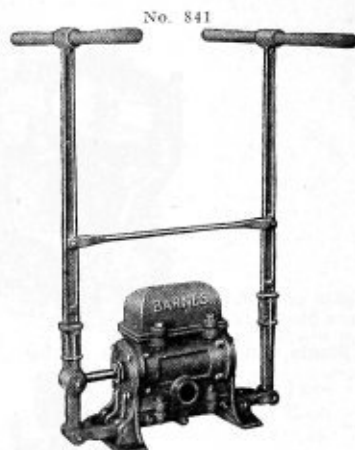


FIG. 1006

The cylinder is brass lined or all-brass, as ordered; the Piston Rod, Valves, Valve Seats and Stuffing-Box are all brass, so that all parts of the pump exposed to water are non-corrosive.

Both suction and discharge are fitted regularly for wrought iron pipe, but can be fitted with hose couplings when so ordered, at an extra charge.

NO. 840—ONE MAN FORCE PUMP

No.	Diameter Cylinder, Inches	Stroke, Inches	Suction Fitted for Pipe, Inches	Discharge Fitted for Pipe, Inches	Brass Lined Cylinder,	Brass Cylinder,	Brass,
					Price	Price	Price
2	2½	4½	1¼	1	\$27.00	\$55.00	\$75.00
4	3	4½	1¼	1	28.00	55.00	75.00
8	4	4½	1½	1¼	30.00	60.00	90.00
12	5	5¼	2	1½	40.00	90.00	150.00
16	6	5¼	2½	2	50.00	120.00	185.00

NO. 841—TWO OR FOUR MAN FORCE PUMP

No.	Diameter Cylinder, Inches	Stroke, Inches	Suction Fitted for Pipe, Inches	Discharge Fitted for Pipe, Inches	Brass Lined Cylinder,	Brass, Cylinder,	Brass
					Price	Price	Price
8	4	4½	1½	1¼	\$35.00	\$65.00	\$100.00
12	5	5¼	2	1½	45.00	95.00	155.00
16	6	5¼	2½	2	55.00	125.00	195.00

BARNES DOUBLE-ACTING FORCE PUMPS ANTI-FREEZING

No. 828 Thresher Tank

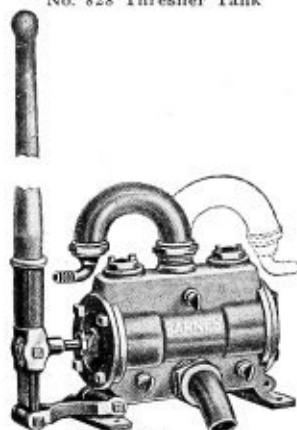


FIG. 1007

"Pneumatic"



FIG. 1008

BARNES FAVORITE THRESHER TANK FORCE PUMP

The Favorite is easily operated, and will discharge about $2\frac{1}{2}$ barrels of water per minute; has a 5-inch polished cylinder, brass valve seats and full 2-inch openings.

No. 828	Size Cylind'r	Stroke	Suction	Discharge	Price
Pump and Strainer only.	5-inch	5-inch	2-inch hose and pipe	1-inch hose or 2-inch pipe	\$18.00
No. 1 Outfit.	No. 828—Thresher Tank Pump, with 15 ft. 2-in. spiral wired suction hose, 10 ft. 1-in. 3-ply discharge hose, clamps, suction strainer and nozzle, all complete				40.00
No. 2 Outfit.	No. 828—Thresher Tank Pump, with 20 ft. 2-in. spiral wired suction hose, 10 ft. 1-in. 3-ply discharge hose, clamps, suction strainer and nozzle, all complete				45.00
No. 3 Outfit.	No. 828—Thresher Tank Pump, with 25 ft. 2-in. spiral wired suction hose, 10 ft. 1-in. 3-ply discharge hose, clamps, suction strainer and nozzle, all complete				50.00

No. 828 can be furnished with Brass Lined Cylinder by adding \$8.00 to above list prices.

BARNES PNEUMATIC FORCE PUMP

Has ratchet head and air cylinder and is used in connection with compressed air water system.

The special ratchet head is very powerful and will easily produce a pressure of 100 lbs. to the square inch, which is more than is ever necessary.

No.	Diameter of Cylinder	Stroke	Suction Fitted for	Discharge Fitted for	Iron, Price	Brass Lined, Price
4	3-inch	4 $\frac{1}{2}$ -inch	1 $\frac{1}{4}$ -inch pipe	1 $\frac{1}{4}$ -inch pipe	\$16.00	\$18.00

NELSON HOME WATER WORKS SYSTEM

WITH HAND FORCE PUMP

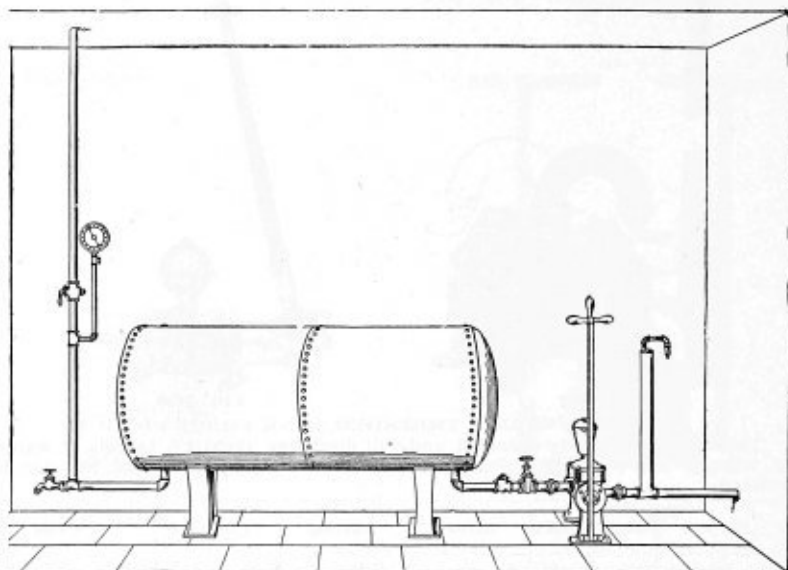


FIG. 1009

This combination illustrates our home water works system with priming chamber. The tank has a total capacity of 220 gallons and will deliver 160 gallons of water, an amount sufficient to supply an ordinary family two days for kitchen and bathroom purposes. The pump is especially constructed for this work and has the strength and ease of operation seldom found in an ordinary pump of this type. The outfit is equipped with our positive intake air valve and priming chamber which insures not only the right amount of air, but prevents the pump from losing its priming. The pump is suitable for either well or cistern water, but in no case should the level of the water in well or cistern be more than 20 feet below the pump. A complete outfit consists of the following:

- One 30-inch x 6-foot Nelson air pressure tank.
- One double acting horizontal force pump with brass lined cylinder.
- One priming chamber.
- One intake air valve.
- One 5-inch air pressure gauge.
- One water gauge.
- One 1-inch gate valve.
- One 1-inch swing check valve.
- One $\frac{3}{4}$ -inch stop and waste cock.
- One $\frac{1}{2}$ -inch drain cock.

No pipe or fittings are included. Tank supports, as shown, are not included with this outfit.

Price of complete outfit..... \$140.00

THE EMERSON STEAM PUMP

STANDARD TYPE

The EMERSON is a steam vacuum pump designed and built to handle mud, sand, grit, etc., in percentages with the water impossible by any other type or make of pump. For this reason it is the best pump for contractors, mines, railroads and all having rough and unusual pumping problems.

The pump is hung from a beam or tripod, and can be raised or lowered as conditions warrant. It is practically indestructible, is entirely self-contained, and has no working parts exposed or in sight, nor do any working parts come in contact with the material being pumped.

It is most economical of steam, this being used twice; first to force the water from the pump and then, by condensing, to form the vacuum which makes the suction. No steam is liberated to interfere with the work.

The latest type pump has the body of steel pipe instead of cast iron, thus greatly reducing weight and facilitating handling and installation.

EMERSON PUMPS require NO LUBRICATION. This, too, is a great saving in cost of operation.

Table showing sizes, capacities, weights, price list and other data of Emerson Standard Steam Pumps:

No.	Inside Diam. of Cylinders Inches	Length of Cyls., Feet	Size of Steam Pipe, Inches	Size of Suction, Inches	Size of Discharge, Inches	Capacity in Gallons Per Minute	Dimensions Over All in Inches			Shipping Weight in Pounds	List Price
							Breadth	Width	Height		
E1	4	6	1½	2	2½	140	16	13	75	485	\$175.00
EE1	5	6	¾	3	3	200	16	19	84	625	225.00
1	6	6	¾	4	2½	260	16½	18	97½	900	275.00
2	8	6½	1	4	3	450	21½	21	104	1050	350.00
3	10	7	1¼	5	4	735	26	24	113	1700	500.00
4	12	8	1½	6	5	1150	29½	27½	127	2075	700.00
5	16	8	2	8	6	2000	43¼	33	132	5500	1150.00
6	20	8	2½	10	8	3000	51½	36¾	135	6000	1500.00

Capacities stated in table, in gallons per minute, are calculated on a head or lift of 20 feet. These diminish at the rate of about 4 per cent for every 10 feet additional head up to 150 feet, the highest head for which we recommend our Standard Pumps.

Pumps entirely of bronze will be made on application at special prices.

*All pumps are securely crated and bolted to heavy skids, thus guaranteeing safe carriage.

NOTE—The above list prices are subject to a general increase of 10 per cent.

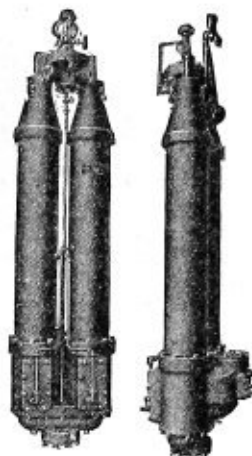


FIG. 1010

FIG. 1011

BARNES HIGH PRESSURE FORCE PUMP

COMPLETE WITH GAS OR GASOLINE ENGINE AND ELECTRIC MOTORS

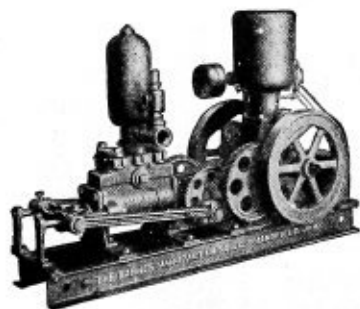


FIG 1012

For long distance pumping, high vertical lifts, and all severe conditions where the suction lift is not greater than 25 feet.

JUST THE OUTFIT TO SUPPLY WATER

- for road construction, where many times water must be forced several miles horizontally.
- for concrete mixers in sidewalk construction on subdivisions.
- for well drilling and boiler supply in oil fields.
- for farm, cottage or country estate.
- for fire protection.
- for village water systems.
- for factory water supply.
- for coal mine drainage.

SPECIFICATIONS

Outfit No.	H. P. Engine	Size of Pump		Size of Suction and Discharge, Inches	Capacity Gallons, Per Hour	Pump, Revolutions Per Minute	Total Head in Feet	Pressure, Pounds Per Square Inch	Bare Weight Pounds	Shipping Weight, Pounds
		Cyl. Diam. Inches	Stroke Inches							
11	3	3	5	1½	850	50	400	175	700	825
11A	4	3	5	1½	850	50	515	225	850	975
12	4	3	5	2	1200	45	400	175	975	1100
12A	6	4	5	2	1300	50	515	225	1250	1425
13	6	5	5	2½	2000	45	400	175	1475	1600
13A	8	5	5	2½	2200	50	515	225	1700	1950

SPECIAL HIGH PRESSURE OUTFITS

14	4	3	5	2	800	45	690	300	1000	1125
14A	6	3	5	2	850	50	690	300	1300	1450
15	6	4	5	2½	1200	45	690	300	1500	1650
15A	8	4	5	2½	1800	50	690	300	1775	1925
16	6	3	5	2	800	45	1000	450	1475	1650
16A	8	3	5	2	850	50	1150	500	1750	2000

LARGE CAPACITY OUTFITS

17	6	6	6	3	3000	50	175	90	1425	1600
17A	8	6	6	3	3000	50	265	125	1700	1900

NOTE—The capacities shown in the above tables are actual and not theoretical piston displacements.

THE PROPER SIZE OF PUMP—To determine the size of pump for a particular job the following data must be known: The

- 1—Number of gallons required per minute or per hour.
- 2—Discharge head.
- 3—Suction head.
- 4—Number of feet of discharge pipe to be used.
- 5—Diameter of discharge pipe.

BARNES ROTARY FORCE PUMPS

Construction—The cases and cams on our Rotary Pumps are carefully machined on all faces and are fitted so accurately that the pumps will produce almost a perfect vacuum. They will draw water as far as the best pumps of other types, and for certain purposes are superior to any other style of pump. The cams are of the shape long experience has found to be most efficient and durable. For pumping alkalies, wines, acids, etc., the bronze pumps should always be used.

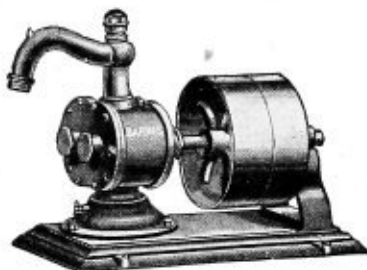


FIG. 1013

This Pump is adapted for use in creameries, factories, distilleries, breweries, etc., and occupies a smaller space than any other style of pump of equal capacity making it especially desirable for such places. The working parts are all securely mounted on a heavy iron frame with tight and loose pulleys. Bearings on shaft are babbitt-lined and of ample width to give long wear. When desired we will make the shaft long enough to take a fly-wheel outside of the bearing; but fly-wheel and long shaft are only furnished at an extra charge.

The spout is adjustable to any position desired. By removing the cap from the top and placing it on the end of the spout—the pump will discharge vertically and may be connected with iron pipe for forcing into elevated storage tanks. For pumping hot water metallic valves must be used, and the liquid must flow to the pump as the vapor arising prevents the formation of a vacuum. Freezing is prevented by removing the drain plugs, and turning the cams backward to let out the water. Every pump is tested before leaving our factory.

Bronze Pumps are all bronze except Base, Bearings and Pulleys. Pumps with Bronze Case and Cams have bronze shafts also, but Spout and Base with lower valve are of iron.

No.	Capacity Per Min. 100 Rev., Gal.	Suction Pipe, In.	Dis- charge Pipe, In.	Pulley, Each, In.	Lift and Force, Ft.	Iron	Bronze Case and Cams	Bronze
						Price	Price	Price
1	10	1½	1	8x2½	60	\$27.00	49.00	60.00
2	13	1½	1	8x2½	60	32.00	56.00	65.00
3	17	1½	1½	8x2½	60	38.00	63.00	75.00
4	27	2	1½	12x3½	60	48.00	78.00	100.00
5	36	2	2	12x3½	60	54.00	90.00	120.00
6	45	3	2½	14x4	60	80.00	135.00	175.00

BARNES "CAPITAL" HOUSE FORCE PUMP
WITH BRASS CYLINDER AND WOOD HANDLE



FIG. 1014

This pump is especially desirable for raising water from cisterns or shallow wells to an attic tank and at the same time will furnish an abundance of water for the laundry or kitchen sink.

It has a full 6-inch stroke and 3-inch Brass Cylinder, Brass Piston Rod and Oval Brass Valve Seat. It is fitted with our New Compression Spout and is tapped back of the spout for 1-inch pipe connection. Suction is regularly fitted for 1 1/4 in. iron pipe, but can be fitted for lead pipe, if desired, at a small extra charge.

No. 205.....Price, each \$10.00

BARNES "HANDY" HOUSE FORCE PUMPS

No. 211



FIG. 1015

No. 207



FIG. 1016

"Handy" House Force Pumps are suitable for raising and forcing water to any part of a house from cisterns or shallow wells. These pumps all have seamless brass tube cylinders, brass plungers, brass plunger rods and brass valve seats. They are tapped in back for 1-inch iron pipe. No. 211 is tapped for 3/4-inch bibb at discharge, while No. 207 has spout cast on with shut-off forcing water up into tanks.

We fit these pumps for iron pipe unless otherwise specified, but can fit them for lead pipe when ordered.

To prevent freezing raise handle to extreme height, thus tripping the valves. All parts are lettered and numbered.

	Diameter Cylinder	Fitted for pipe	Stroke	Price
No. 211, complete, as shown.....	3-inch	1 1/4-inch	3 1/2-inch	\$7.50
No. 207, complete, as shown.....	3-inch	1 1/4-inch	3 1/2-inch	7.50

We furnish Compression or Fuller Bibb Spouts for No. 211 when ordered, at an extra charge.

BARNES PITCHER SPOUT PUMPS

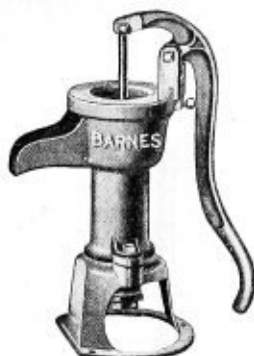


FIG. 1017

This cut shows new style Closed Top Pitcher Spout Pump with revolving top, so that lever can be placed on any side of the pump, and is furnished with or without brass valve seats.

The new style top is a decided improvement over any other similar pump on the market. Valves trip by raising handle to extreme height, thus preventing freezing of the pump.

No.	Size Cylinder, Inches	Fitted for Pipe, Inches	Stroke, Inches	Iron,	Brass	Porcelain Lined, Price
				Price	Lined, Price	
1	2½	1	4	\$4.25	\$6.50	\$6.50
2	3	1¼	4	4.75	7.25	7.25
3	3½	1¼	4	5.25	8.00	8.00
4	4	1½	4½	6.25	9.00	9.00
5	4½	2	5	9.50	12.50	12.50

Unless otherwise ordered all Pitcher Spout Pumps will be fitted for iron pipe only.

If lead pipe connections are wanted there will be an extra charge. If brass valve seats are wanted there will be an extra charge.



FIG. 1018

BARNES "UNIVERSAL" DOUBLE-ACTING OSCILLATING FORCE PUMP

It is a very powerful and substantial pump and having no leather valves is suitable for pumping hot liquids, wines, oils, etc. The working parts consist of a brass double-swing oscillating piston with bronze valves on each wing. The waterways of each set of valves are separate in the suction chamber. The piston is operated by the shaft or piston rod to which the lever is attached. This lever can be placed in any position to suit the convenience of the operator.

"Bronze Fitted" Pumps have all working parts and valves of bronze. "Bronze" Pumps have the entire case and working parts of bronze. Fitted regularly for iron pipe. Lead pipe connections can be furnished when so ordered at an additional cost.

Size Number	Capacity Per Minute, Gals.	Suction and Discharge Pipe, Inches	Bronze Fitted,	Bronze,
			Price	Price
1	4	½	\$ 8.00	\$16.00
2	5	¾	9.50	20.00
3	6	1	11.00	27.50
4	9	1¼	13.00	35.00
5	13	1¼	16.00	42.50
6	19	1½	20.00	50.00
8	26	2	27.50	70.00
9	36	2½	40.00	90.00

BARNES WELL PUMPS

No. 606



FIG. 1019

No. 300



FIG. 1020

No. 554



FIG. 1021

NO. 606. ANTI-FREEZING WELL PUMP

Has wrought iron set lengths. Open top for wells ordinary depth.

Size No.	Diameter Cylinder, Inches	Fitted for Pipe, Inches	Stroke, Inches	Iron Cylinder,	Brass or Porcelain Lined Cylinder,	Brass Tube Cylinder,
				Price	Price	Price
2	2½	1¼	6	\$7.50	\$10.00	\$12.00
3	2¾	1¼	6	7.75	10.25	12.25
4	3	1¼	6	8.00	10.50	12.50

NO. 300. LIFT PUMP

With revolving top, adjustable base and brace. Syphon Spout. Anti-Freezing. For cisterns and wells up to 50 feet deep.

Size No.	Diameter Cylinder, Inches	Fitted for Pipe, Inches	Stroke, Inches	Price	Price	Price
2	2½	1¼	6	\$5.00	\$6.00	\$7.00
4	3	1¼	6	5.50	6.50	7.50

NO. 554. "IMPERIAL" DOUBLE-ACTING FORCE PUMP

With windmill head and three-way valve. Anti-freezing. For deep or shallow wells.

Size No.	Size Lower Cylinder, Inches	Diameter Upper Cylinder, Inches	Fitted for Pipe, Inches	Stroke, Inches	Brass Lined Cylinder, Price	Brass Cylinder, Price
1	2½x12	1½	1¼	6	\$19.00	\$20.00
2	2½x12	1¾	1¼	6	19.00	20.00
4	3x12	2	1¼	6	19.00	20.00
6	3½x12	2½	1¼	6	20.00	21.00
7	2½x14	1¾	1¼	10	20.00	21.00
8	3x14	2	1¼	10	20.00	21.00

BARNES ADJUSTABLE BASE LIFT PUMP WITH TIGHT REVOLVING TOP AND SYPHON SPOUT

No. 301 is a Closed Top adjustable base set length pump, with syphon spout and revolving top. It is an excellent pump for general purposes and has made itself many friends among the driven-well men. It works very easily and always throws a steady continuous stream. The chamber is large and the spout opening full size so that the pump will not overflow when operated rapidly.

The stock of the pump is $1\frac{1}{2}$ -inch wrought iron pipe and set length is $1\frac{1}{4}$ -inch pipe. By lowering the cylinder into or near the water this pump will give excellent satisfaction in wells of 50 to 75 feet in depth. The Plunger Rod is galvanized steel and is coupled at top of cylinder for convenience in lowering same for deep wells.

No.	Diam. Cyl., In.	Fitted for Pipe, In.	Stroke, In.	Iron Cyl.	Brass Lined Cyl.	Brass Cyl.
				Price	Price	Price
2	$2\frac{1}{2}$	$1\frac{1}{4}$	6	\$6.00	7.00	8.00
4	3	$1\frac{1}{4}$	6	6.00	7.00	8.00
6	$3\frac{1}{2}$	$1\frac{1}{4}$	6	7.00	8.00	9.00



FIG. 1022

BARNES IMPROVED THREE-WAY WIND MILL FORCE PUMPS

ANTI-FREEZING

No. 575 represents a new Anti-Freezing Wind Mill Force Pump, with three-way distributing valve. The water may be controlled by a slight turn of the hand wheel and discharged through the spout or forced under the ground through the brass elbow as shown in lower working head, which contains the distributing valve. By removing cap on lower working head and plate on platform, plungers from 2 inches to 3 inches in diameter can be drawn up and repaired without removing pump from well.

No. 1 has $1\frac{1}{2}$ -inch air chamber, while No. 2 has 2-inch air chamber. The upper discharge is fitted for $\frac{3}{4}$ -inch hose, the lower discharge at brass elbow is fitted for 1-inch pipe.

No.	6-Inch Stroke		10-Inch Stroke	
	Fitted for	Price	Fitted for	Price
1	$1\frac{1}{4}$ -inch pipe	\$17.00	2-inch pipe	\$18.50
2	$1\frac{1}{4}$ -inch pipe	18.00	2-inch pipe	19.50



FIG. 1023

PUMP CYLINDERS

Sectional View

Inside Cap



FIG. 1024

Inside Cap



FIG. 1025



FIG. 1026

Iron



FIG. 1027

Size	All Iron	Iron		Brass Body & Brass Lined Iron Caps	
		Iron	Brass Cage and Valve	Brass Cage and Valve Iron Follow Plunger	All Brass Plunger
2 x10	\$3.75	\$4.50	\$7.50	\$8.00	\$10.75
2 1/2 x10	4.35	5.35	8.00	8.50	12.25
3 x10	5.00	6.25	9.00	9.75	13.50
3 1/2 x10	7.00	8.75	10.50	11.50	16.75
4 x10	9.00	11.50	13.00	15.50	21.50
4 1/2 x10	12.50	15.75	20.00	22.50	30.00
5 x10	16.50	20.50	26.50	30.00	40.00
6 x10	24.00	29.00	40.00	45.00	60.00
2 x12	5.50	6.25	8.00	9.25	11.25
2 1/2 x12	6.00	7.00	8.50	9.75	12.75
3 x12	7.00	8.25	9.50	11.00	14.00
3 1/2 x12	9.00	10.75	11.25	13.75	17.50
4 x12	11.50	14.00	14.25	18.00	22.50
4 1/2 x12	15.00	18.25	22.00	26.00	34.00
5 x12	20.00	24.00	30.00	35.00	46.00
6 x12	28.50	33.50	45.00	50.00	65.00
2 x14	6.00	6.75	8.50	9.75	13.00
2 1/2 x14	6.50	7.50	9.25	10.50	14.75
3 x14	7.50	8.75	10.25	11.75	16.25
3 1/2 x14	10.00	11.75	12.25	14.75	21.00
4 x14	13.00	15.50	15.75	19.00	26.50
4 1/2 x14	17.50	20.75	24.00	28.00	36.00
5 x14	22.50	26.50	33.00	38.00	50.00
6 x14	33.50	38.50	50.00	56.00	70.00
2 x16	6.00	6.75	9.00	10.50	13.75
2 1/2 x16	7.00	8.00	10.25	11.75	16.00
3 x16	8.00	9.25	11.25	12.75	17.25
3 1/2 x16	11.25	13.00	13.50	16.00	22.25
1 3/4 x12 All brass	\$11.25		1 3/4 x20 All brass	\$14.75	
1 3/4 x14 All brass	13.00		1 3/4 x22 All brass	15.25	
1 3/4 x16 All brass	13.75		1 3/4 x24 All brass	15.75	
1 3/4 x18 All brass	14.25		1 3/4 x26 All brass	16.25	

These small cylinders are tapped for one-inch pipe for use in a two-inch cased well.

NELSON PUMPING JACKS

No. 1 Clamp Jack

No. 2 Double Back Geared Jack

No. 4 Double Geared Jack



FIG. 1028



FIG. 1029



FIG. 1030

NO. 1 JACK

No. 1 Clamp Jack is single geared 4 to 1, three throw cranks for 5, $7\frac{1}{2}$ and 10 inch stroke. Tight and loose pulleys 13-in. diameter, 2-in. face. Price.....\$7.70

NO. 2 JACK

No. 2 Double Back Geared Jack is geared 16 to 1, three throw cranks for 5, $7\frac{1}{2}$ and 10 inch stroke. Tight and loose pulley 10 inch diameter, 2 inch face. Steel shafts, long bearings. Price.....\$11.00

NO. 4 JACK

No. 4 Double Geared Jack is geared 4 to 1, three throw cranks for 5, $7\frac{1}{2}$ and 10 inch stroke. Tight and loose pulleys, 13 inch diameter, 2 inch face.....\$8.80

CHAMBERLAIN RING-OILING PUMPING JACKS

No. 5 Single Gear

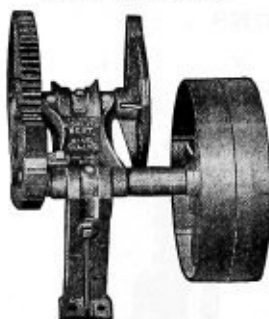


FIG. 1031

Vertical View of
Main Frame Showing Rings

FIG. 1032

No. 4 Double Gear

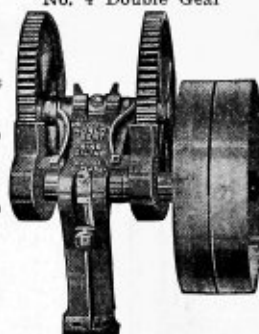


FIG. 1033

NO. 5 SINGLE GEAR

These jacks are ring-oiled and have extra long bearing surfaces, insuring long, satisfactory service. Built for wells 150 to 200 feet deep.

NO. 4 DOUBLE GEAR

These jacks are built with the same care as the No. 5, but are designed for wells 200 to 300 feet deep.

Number	5	4
Stroke, Adjustable	inches 5, 7½, 10	5, 7½, 10
Size of Pulleys, Tight and Loose	" 13	13
Gear Ratio	5 to 1	5 to 1
Weight, Crated	pounds 83	90
Price	each 7.00	7.75

CHAMBERLAIN PLAIN-OILING PUMPING JACK

(NOT ILLUSTRATED)

NO. 2 TRIPLE GEAR

These jacks are very strong and reliable and are built for wells over 300 feet deep.

NO. 0 SINGLE GEAR

These jacks are built with the same care and precision as the triple gear, but are more especially designed for wells less than 100 feet deep.

Number	2	0
Stroke, Adjustable	inches 5, 7½, 10	5, 7½, 10
Size of Pulleys, Tight and Loose	" 10	13
Gear Ratio	8 to 1	5 to 1
Weight, Crated	pounds 96	69
Price	each 12.00	6.00

BRASS ARTESIAN DEEP WELL CYLINDERS



FIG. 1034

Inside Diameter, Inches	Stroke, Inches	Capacity per Stroke, Gal.	Length Pump Chamber, Inches	Top and Bottom Con't'g Pipes, In.	Square Wood Sucker Rod, Inches	All Brass
2 1/4	10	.172	26	2 1/2	1 1/4	\$26.00
2 1/4	12	.206	28	2 1/2	1 1/4	28.00
2 1/4	16	.275	32	2 1/2	1 1/4	28.00
2 1/4	20	.344	36	2 1/2	1 1/4	30.00
2 1/4	24	.413	40	2 1/2	1 1/4	30.00
2 1/4	30	.516	46	2 1/2	1 1/4	32.00
2 3/4	10	.257	26	3	1 1/2	34.00
2 3/4	12	.309	28	3	1 1/2	36.00
2 3/4	14	.359	30	3	1 1/2	36.00
2 3/4	16	.411	32	3	1 1/2	36.00
2 3/4	20	.514	36	3	1 1/2	38.00
2 3/4	24	.617	40	3	1 1/2	38.00
2 3/4	30	.771	46	3	1 1/2	40.00
2 3/4	36	.925	52	3	1 1/2	42.00
3 1/4	10	.359	30	3 1/2	2	45.00
3 1/4	12	.431	32	3 1/2	2	48.00
3 1/4	14	.503	34	3 1/2	2	48.00
3 1/4	16	.574	36	3 1/2	2	48.00
3 1/4	20	.718	40	3 1/2	2	52.00
3 1/4	24	.862	44	3 1/2	2	52.00
3 1/4	30	1.077	50	3 1/2	2	55.00
3 1/4	36	1.290	56	3 1/2	2	58.00
3 3/4	10	.478	34	4	2 1/4	67.50
3 3/4	12	.574	36	4	2 1/4	70.00
3 3/4	14	.669	38	4	2 1/4	70.00
3 3/4	16	.764	40	4	2 1/4	70.00
3 3/4	20	.956	44	4	2 1/4	75.00
3 3/4	24	1.140	48	4	2 1/4	75.00
3 3/4	30	1.430	54	4	2 1/4	80.00
3 3/4	36	1.721	60	4	2 1/4	85.00
4 1/4	10	.614	34	4 1/2	2 1/2	87.50
4 1/4	12	.737	36	4 1/2	2 1/2	90.00
4 1/4	14	.859	38	4 1/2	2 1/2	90.00
4 1/4	16	.982	40	4 1/2	2 1/2	90.00
4 1/4	20	1.228	44	4 1/2	2 1/2	95.00
4 1/4	24	1.470	48	4 1/2	2 1/2	95.00
4 1/4	30	1.840	54	4 1/2	2 1/2	100.00
4 1/4	36	2.211	60	4 1/2	2 1/2	105.00
4 3/4	10	.77	34	5	3	120.00
4 3/4	12	.92	36	5	3	127.50
4 3/4	14	1.07	38	5	3	127.50
4 3/4	16	1.22	40	5	3	127.50
4 3/4	20	1.53	44	5	3	135.00
4 3/4	24	1.84	48	5	3	135.00
4 3/4	30	2.30	54	5	3	142.50
4 3/4	36	2.76	60	5	3	150.00
5 3/4	10	1.12	34	6	3 1/2	172.50
5 3/4	14	1.57	38	6	3 1/2	180.00
5 3/4	16	1.78	40	6	3 1/2	180.00
5 3/4	20	2.25	44	6	3 1/2	195.00

DRIVE WELL POINTS

Brass
Jacket

FIG. 1035



Washer

FIG. 1036



Flush

FIG. 1037

Trade No.	Inside Diam., Inches	Length of Pipe Inches	Length of Jacket Inches	Price, Per Dozen					
				No. 60 Gauze	No. 70 Gauze	No. 80 Gauze	No. 90 Gauze	No. 100 Gauze	No. 120 Gauze
74	1	24	18	\$33.00	\$40.00	\$46.00	\$52.00	\$62.00	\$74.00
76	1	30	24	42.00	49.00	56.00	64.00	78.00	94.00
78	1	36	30	51.00	59.00	66.00	76.00	94.00	114.00
80	1	42	36	60.00	68.00	76.00	88.00	120.00	134.00
82	1	48	42	69.00	78.00	86.00	100.00	136.00	154.00
84	1	54	48	78.00	87.00	96.00	112.00	152.00	174.00
86	1 1/4	20	14	30.00	36.00	42.00	50.00	64.00	80.00
90	1 1/4	24	18	36.00	44.00	52.00	60.00	80.00	105.00
94	1 1/4	30	24	46.00	55.00	64.00	75.00	100.00	130.00
98	1 1/4	36	30	56.00	66.00	76.00	90.00	120.00	155.00
100	1 1/4	42	36	66.00	77.00	88.00	105.00	140.00	180.00
102	1 1/4	48	42	76.00	88.00	100.00	120.00	160.00	205.00
106	1 1/4	54	48	86.00	99.00	112.00	135.00	180.00	230.00
110	1 1/4	60	54	96.00	110.00	124.00	150.00	200.00	255.00
112	1 1/4	66	60	106.00	121.00	136.00	165.00	220.00	280.00
114	1 1/4	72	66	116.00	132.00	148.00	180.00	240.00	305.00
126	1 1/2	24	18	48.00	57.00	65.00	78.00	94.00	112.00
140	1 1/2	30	24	60.00	70.00	80.00	96.00	118.00	139.00
144	1 1/2	36	30	72.00	84.00	95.00	114.00	142.00	166.00
146	1 1/2	42	36	84.00	97.00	110.00	132.00	166.00	193.00
148	1 1/2	48	42	96.00	111.00	125.00	150.00	188.00	220.00
150	1 1/2	54	48	108.00	124.00	140.00	168.00	204.00	247.00
152	1 1/2	60	54	120.00	138.00	155.00	186.00	228.00	274.00
154	1 1/2	66	60	132.00	151.00	170.00	204.00	252.00	301.00
156	1 1/2	72	66	144.00	165.00	185.00	222.00	276.00	328.00
160	2	24	18	75.00	85.00	94.00	110.00	130.00	150.00
164	2	30	24	90.00	101.00	112.00	132.00	160.00	185.00
168	2	36	30	105.00	118.00	130.00	154.00	190.00	220.00
170	2	42	36	120.00	134.00	148.00	176.00	220.00	255.00
172	2	48	42	135.00	151.00	166.00	198.00	250.00	290.00
174	2	54	48	150.00	167.00	184.00	220.00	280.00	325.00
176	2	60	54	165.00	184.00	202.00	242.00	310.00	360.00
178	2	66	60	180.00	200.00	220.00	264.00	340.00	395.00
180	2	72	66	195.00	217.00	238.00	286.00	370.00	430.00
184	2 1/2	36	30	180.00	205.00	230.00	260.00	300.00	350.00
188	2 1/2	48	42	230.00	265.00	300.00	340.00	400.00	470.00
192	2 1/2	60	54	280.00	325.00	370.00	420.00	500.00	590.00
196	2 1/2	72	66	330.00	385.00	440.00	500.00	600.00	710.00
200	3	36	30	240.00	275.00	310.00	340.00	410.00	490.00
204	3	48	42	300.00	345.00	390.00	430.00	520.00	630.00
208	3	60	54	360.00	415.00	470.00	520.00	630.00	770.00
212	3	72	66	420.00	485.00	550.00	610.00	740.00	910.00
216	4	48	36	480.00	520.00	560.00	600.00	700.00	810.00
220	4	72	60	630.00	695.00	760.00	840.00	1000.00	1270.00
224	4	96	84	780.00	870.00	960.00	1080.00	1300.00	1610.00
228	4	120	108	930.00	1045.00	1160.00	1320.00	1600.00	2010.00

CUP AND VALVE LEATHERS



FIG. 1038

Made from best quality oak tanned leather.

Uniform in diameter and thickness.

In ordering please specify whether solid bottom or hole is wanted; if hole, give diameter of same.

Size . inches	1	1¼	1½	1¾	2	2¼	2½	2¾	3	3¼	3½
Per gross...	\$3.50	4.50	6.00	8.00	9.00	10.00	13.00	14.50	16.50	18.50	24.50

Size.....inches	3¾	4	4¼	4½	4¾	5	5¼	5½	5¾	6
Per gross	\$29.00	31.50	37.50	40.00	43.00	49.00	50.00	57.50	65.00	72.00

No. 700
Lower Valve Leather

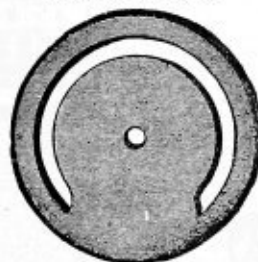


FIG. 1039

No. 701
Flat Plunger Leather



FIG. 1040

VALVE AND
PLUNGER
LEATHERS

MADE OF PURE OAK
TANNED STOCK

Outside Diam., inches	For Cylinder, Inches	Per Gross	Outside Diam., inches	For Cylinder, Inches	Per Gross
2	1½	\$5.00	4½	4	\$18.00
2¼	1¾	6.00	5	4¼	19.50
2½	2	6.50	5¼	4½	21.00
2¾	2¼	8.00	5½	5	26.00
3	2½	8.50	6¾	6	35.00
3¼	2¾	10.00	7¾	7	46.00
3½	3	10.50	8¾	8	60.00
3¾	3¼	13.00	9¾	9	78.00
4	3½	15.50	10¾	10	100.00

EARTH AUGERS

Chisel Bit Auger



FIG. 1041

Pod Auger



FIG. 1042

Ribbon Auger



FIG. 1043

Twist Auger



FIG. 1044

Spiral Auger



FIG. 1045

Size of hole augers will make.....Inches	2	2½	3	3½	4	4½	5	6
Chisel Bit Auger, for clay and hard pan.....each	6.00	6.50	7.00	8.50	10.00	15.00	20.00	25.00
Pod Auger, for boring and removing core.....	6.00	6.50	7.00	8.50	10.00	15.00	20.00	25.00
Ribbon Auger, for general boring.....	6.00	6.50	7.00	8.50	10.00	15.00	20.00	25.00
Twist Auger, for general boring.....	6.00	6.50	7.00	8.50	10.00	15.00	20.00	25.00
Spiral Auger, for loosening and removing stones.....	6.00	6.50	7.00	8.50	10.00	15.00	20.00	25.00

LIFTING AND SLIDING TONGS

USED FOR LOWERING PIPE INTO WELLS

Lifting Tong

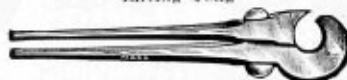


FIG. 1046

Sliding Tong

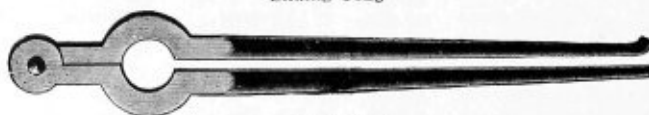


FIG. 1047

PRICE LIST EITHER TOOL

Number.....	1	2	3	4	5
Used for pipe.....inches	¾	1	1½	1¾	2
Price.....each	4.00	4.50	5.00	5.50	6.00

MALLEABLE WOOD ROD COUPLINGS



FIG. 1048

These couplings have a socket for the ends of the rods to be driven into to prevent them splitting.

For 1 and 1½ inch Rod, plain, 2 hole, per pair.....	\$0.10
For 1 and 1½ inch Rod, galv., 2 hole, per pair.....	.14
For 1 and 1½ inch Rod, plain, 3 hole, per pair.....	.16
For 1 and 1½ inch Rod, galv., 3 hole, per pair.....	.20
For 1½ and 1¾ inch Rod, plain, 3 hole, per pair.....	.20
For 1½ and 1¾ inch Rod, galv., 3 hole, per pair.....	.24

FORGED STEEL SUCKER ROD COUPLINGS



FIG. 1049

These are of forged steel, with straight box and pin. They are interchangeable with oil well couplings of same size.

Size of Wood Rod, Inches	Size of Box and Pin, Inches	Adapted for Size Working Barrel	Price per Set, Plain	Price per Set, Galvanized
1½	¾	1¾ to 2¼	\$0.60	\$0.85
1¾	¾	2¼ to 2¾	.75	1.15
1¾	1	2¾ to 3¾	1.30	1.75
2¼	1½	3¾ to 5¾	2.00	2.60
3½	1½	5¾ to 8¾	5.00	6.00

For special sizes not listed above, prices quoted upon request.

OCTAGON WOOD SUCKER RODS



FIG. 1050

Our Wood Sucker Rods are made of best quality selected ash and are furnished in random lengths of about 20 feet unless otherwise specified.

Size of Rod, Inches	Size Working Barrel Adapted for	Price per Foot, Blank	Price Per Foot with Forged Sucker Rod Couplings	Price per Foot with Forged Galvanized Sucker Rod Couplings and Copper Rivets
1½	1¾ to 2¼	\$0.04	\$0.08	\$0.15
1¾	2¼ to 2¾	.05	.11	.20
1¾	2¾ to 3¾	.09	.18	.30
2¼	3¾ to 5¾	.14	.25	.40
3½	5¾ to 8¾	.30	.65	1.10

On special sizes not listed above, prices will be quoted upon request.

PUMP ROD COUPLINGS, GALVANIZED

Price, per pound, \$0.20



FIG. 1051

GALVANIZED STEEL PUMP ROD



FIG. 1052

Price, ¾-inch Steel Pump Rods, Galvanized.....per foot \$.....

WATER TANKS

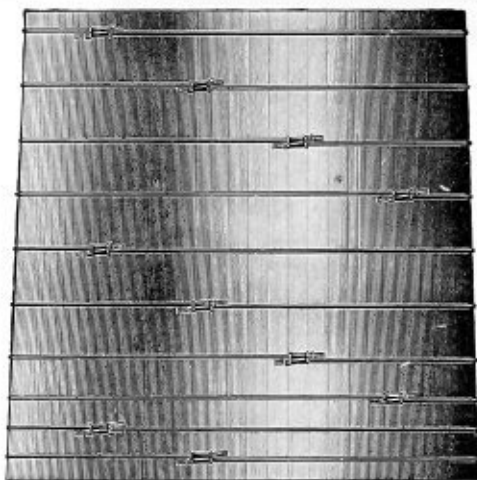


FIG. 1053

CYPRESS

Cypress is everywhere recognized as the ideal wood for tank purposes. It is the most durable wood known and, being very straight grained, will warp and twist but little. It also shrinks and swells less than other woods, and it will not give off any taste or odor or color. For this reason it is especially suitable for cider and vinegar, fruit syrups, coloring dyes and other preparations that would be injured by any contamination from the wood.

Cypress Tanks are used almost exclusively for acids and chemicals, and for hot liquids, as nothing else will give as lasting service.

All of our Cypress is thoroughly kiln-dried or air-dried.

YELLOW PINE

Yellow Pine is used almost altogether for Water Tanks, where something cheaper than Cypress is wanted, and for Brine Tanks in pickle works. This lumber has more knots than Cypress, but our tank plank is cut to our own specifications, and only thoroughly sound and tight knots are accepted, and these must have no black rims, so the value of the lumber is in no wise impaired for tank purposes. This material, when carefully selected stock, such as ours, is used, makes a good, serviceable tank that will last for years.

LIST PRICES OF ROUND TANKS CYPRESS AND YELLOW PINE

Prices quoted for White Pine and Yellow Poplar on Application.

No.	Gals.	Weights and List Prices on Wood Tanks								
		Inside Diam. Ft. In.	Inside Depth Ft. In.	No. of H'ps	1½ In. Cyp.		2 In. Cypress		3 In. Yellow Pine	
					Ship- ping Wt., Lbs.	Price f.o.b. Fcty.	Ship- ping Wt., Lbs.	Price f.o.b. Fcty.	Ship- ping Wt., Lbs.	Price f.o.b. Fcty.
1	127	3.0	2.5	3	157	\$16.68	199	\$21.9	266	\$16.68
2	158	3.0	3.0	3	173	18.57	221	24.14	300	18.57
3	180	3.0	3.5	4	199	21.06	251	37.38	341	21.06
4	174	3.6	2.5	3	182	19.62	234	25.50	336	19.62
5	216	3.6	3.0	3	202	21.87	260	28.43	364	21.87
6	246	3.6	3.5	4	231	24.72	295	32.13	399	24.72
7	226	4.0	2.5	3	214	22.05	274	28.67	376	22.05
8	281	4.0	3.0	3	236	24.51	304	31.86	420	24.51
9	321	4.0	3.5	4	268	27.69	344	36.00	470	27.69
10	413	4.0	4.5	4	312	32.64	404	42.44	564	32.64
11	288	4.6	2.5	3	244	25.35	314	32.96	457	25.35
12	357	4.6	3.0	3	268	27.99	346	36.39	491	27.99
13	407	4.6	3.5	4	306	31.56	392	41.03	533	31.56
14	526	4.6	4.5	4	356	39.66	458	48.09	642	36.99
15	501	5.0	3.5	4	345	34.29	443	44.58	602	34.29
16	587	5.0	4.0	4	373	37.11	479	48.24	661	37.11
17	648	5.0	4.5	4	407	40.35	521	52.46	718	40.35
18	794	5.0	5.5	5	474	46.98	608	61.08	800	46.98
19	317	6.0	1.5	2	279	26.52	357	34.47	475	26.52
20	422	6.0	2.0	3	327	30.90	417	40.17	556	30.90
21	527	6.0	2.5	3	359	34.20	461	44.46	611	34.20
22	720	6.0	3.5	4	440	41.73	562	54.26	752	41.73
23	845	6.0	4.0	4	472	45.03	606	58.55	814	45.03
24	934	6.0	4.5	4	514	48.81	658	63.45	883	48.81
25	1145	6.0	5.5	5	602	56.86	768	73.95	1018	56.88
26	1356	6.0	6.5	6	684	64.56	872	83.93	1162	64.56
27	1567	6.0	7.5	7	770	72.51	980	94.26	1284	72.51
28	1778	6.0	8.5	7	836	79.11	1068	112.84	1427	79.11
29	1989	6.0	9.5	8	924	87.12	1176	113.25	1585	87.12
30	1006	6.6	4.5	4	563	53.46	721	69.50	964	53.46
31	1344	6.6	5.5	5	657	62.16	839	81.81	1122	62.16
32	1592	6.6	6.5	5	742	70.35	950	91.47	1277	70.35
33	1840	6.6	7.5	7	839	79.08	1069	102.81	1411	79.08
34	2088	6.6	8.5	7	909	86.13	1163	111.98	1568	86.13
35	2336	6.6	9.5	8	1005	94.83	1381	123.29	1729	94.83
36	1271	7.0	4.5	4	616	58.59	790	76.17	1059	58.59
37	1659	7.0	5.5	5	717	67.86	917	88.22	1219	67.86
38	1847	7.0	6.5	6	819	77.10	1042	100.23	1384	77.10
39	2135	7.0	7.5	7	912	85.95	1162	111.74	1508	85.95
40	2423	7.0	8.5	7	997	94.02	1271	122.22	1690	94.02
41	2711	7.0	9.5	8	1104	103.77	1404	134.90	1873	103.77
42	1790	7.6	5.5	5	775	73.50	991	95.55	1330	73.50
43	2120	7.6	6.5	6	884	83.34	1128	105.35	1491	83.34
44	2450	7.6	7.5	7	985	92.73	1255	120.56	1660	92.73

LIST PRICES OF ROUND TANKS
CYPRESS AND YELLOW PINE

No.	Gals.	Inside Diam. Ft. In.	Inside Depth Ft. In.	Number of Hoops	Weight and List Prices on Wood Tanks					
					1½ In. Cyp.		2 In. Cypress		2 In. Yel. P.	
					Ship- ping Wt., Lbs.	Price f.o.b. Fcty.	Ship- ping Wt., Lbs.	Price f.o.b. Fcty.	Ship- ping Wt., Lbs.	Price f.o.b. Fcty.
45	2780	7.6	8.5	7	1073	\$101.34	1371	\$131.75	1838	\$101.34
46	3110	7.6	9.5	8	1187	111.75	1513	145.28	2018	111.75
47	563	8.0	1.5	2	423	40.35	545	52.46	735	40.35
48	751	8.0	2.0	3	477	45.42	613	59.04	820	45.42
49	939	8.0	2.5	3	519	49.62	669	64.50	916	49.62
50	1294	8.0	3.5	4	635	60.27	815	78.35	1110	60.27
51	1656	8.0	4.5	4	730	69.45	938	90.29	1240	69.45
52	2031	8.0	5.5	5	846	79.92	1082	103.89	1453	79.92
53	2406	8.0	6.5	6	951	89.94	1217	116.93	1618	89.94
54	2781	8.0	7.5	7	1067	100.44	1361	130.58	1802	100.44
55	3156	8.0	8.5	7	1168	109.95	1490	142.94	1990	109.95
56	3531	8.0	9.5	8	1317	122.85	1669	159.71	2195	122.85
57	4281	8.0	11.5	10	1563	144.84	1971	188.30	2542	144.84
58	2299	8.6	5.5	5	909	85.92	1163	111.69	1576	85.92
59	2723	8.6	6.5	6	1022	96.45	1306	125.39	1744	96.45
60	3148	8.6	7.5	7	1143	107.64	1459	139.94	1921	107.64
61	3572	8.6	8.5	7	1251	117.84	1597	153.20	2137	117.84
62	3696	8.6	9.5	8	1408	131.22	1784	170.58	2335	131.22
63	4844	8.6	11.5	10	1670	154.65	2106	201.05	2713	154.65
64	2577	9.0	5.5	5	1037	92.88	1259	120.75	1670	92.88
65	3053	9.0	6.5	6	1116	104.61	1420	135.99	1838	104.61
66	3529	9.0	7.5	7	1244	116.34	1580	151.25	2059	116.34
67	4004	9.0	8.5	7	1357	127.20	1727	165.36	2256	127.20

No.	Gals.	Inside	Inside	Number of Hoops	Weight and List Prices on Wood Tanks			
		Diam.	Depth		2 In. Cypress		2 In. Yel. P.	
		Ft. In.	Ft. In.		Ship- ping Wt. Lbs.	Price f.o.b. Fcty.	Ship- ping Wt. Lbs.	Price f.o.b. Fcty.
68	4479	9.0	9.5	8	1865	\$182.06	2485	\$140.04
69	5429	9.0	11.5	10	2242	213.96	2877	164.58
70	881	10.0	1.5	2	758	72.93	1023	56.10
71	1175	10.0	2.0	3	862	82.76	1122	63.66
72	1468	10.0	2.5	3	934	89.78	1257	69.06
73	2006	10.0	3.5	4	1113	106.67	1488	82.05
74	2592	10.0	4.5	4	1255	120.51	1694	92.70
75	3182	10.0	5.5	5	1450	138.96	1928	106.89
76	3770	10.0	6.5	6	1631	156.05	2136	120.03
77	4357	10.0	7.5	7	1809	172.85	2386	132.96
78	4945	10.0	8.5	7	1969	188.30	2638	144.84
79	5532	10.0	9.5	8	2165	206.70	2927	159.00
80	6706	10.0	11.5	10	2539	241.95	3405	186.12
81	7880	10.0	13.5	11	2897	275.93	3973	212.25
82	6100	10.6	9.5	8	2290	218.55	3058	168.12
83	1269	12.0	1.5	2	1004	96.84	1365	74.49
84	1692	12.0	2.0	3	1133	108.96	1518	83.82
85	2115	12.0	2.5	3	1217	117.15	1636	90.12

LIST PRICES OF ROUND TANKS

CYPRESS AND YELLOW PINE

Prices quoted for White Pine and Yellow Poplar on Application.

No.	Gallons	Inside Diam.	Inside Depth	Number of Hoops	2 Inch Cypress		2 Inch Yellow Pine	
		Ft. In.	Ft. In.		Shipping Weight, Lbs.	Price f.o.b. Fcty.	Shipping Weight, Lbs.	Price f.o.b. Fcty.
86	2891	12.0	3.5	4	1431	\$137.48	1888	\$105.75
87	3737	"	4.5	4	1623	156.00	2159	120.50
88	4582	"	5.5	5	1837	176.36	2446	135.66
89	5428	"	6.5	6	2050	196.68	2733	151.29
90	6274	"	7.5	7	2284	218.87	3040	168.36
91	7110	"	8.5	7	2479	237.44	3291	182.64
92	7956	"	9.5	8	2715	259.67	3543	199.74
93	9658	"	11.5	10	3164	302.18	4197	232.44
94	11350	"	13.5	12	3637	346.79	4625	266.76
95	13042	"	15.5	14	4150	395.12	5301	303.93
96	7726	12.6	8.5	7	2602	249.17	3506	191.67
97	8644	"	9.5	8	2844	272.37	3788	209.52
98	10481	"	11.5	10	3316	316.64	4461	243.57
99	12317	"	13.5	10	3717	362.90	4876	179.15
100	14153	"	15.5	14	4345	413.16	5738	317.82
101	10080	13.6	9.5	8	3122	298.44	4118	229.56
102	12220	"	11.5	10	3650	348.12	4710	267.78

NOTE—Previous prices are for 1½ and 2-inch Tanks, but the following sizes are priced in 2, 2½ and 3 inch. Tanks 14.0 and 16.0 foot diameter are usually built of 2-inch, and often 18-foot diameter Tanks, but we advise 2½-inch for Tanks over 16 feet diameter to 20 feet inclusive, and 3-inch for larger sizes.

No.	Gals.	Bottom Diam.	Inside Depth	No. Hoops	2 Inch		2½ Inch		3 Inch	
		Ft. In.	Ft. In.		Shipping Weight, Lbs.	Price f.o.b. Fcty.	Shipping Weight, Lbs.	Price f.o.b. Fcty.	Shipping Weight, Lbs.	Price f.o.b. Fcty.
103	8540	14.0	7.5	7	Cyp. 2766	\$264.69	3728	\$365.67	4392	\$431.85
					Y. P. 3654	203.61	4837	281.28	5732	332.19
104	9691	"	8.5	7	Cyp. 2990	286.22	4031	395.51	4270	467.27
					Y. P. 3953	220.17	5232	304.23	6192	359.43
105	10843	"	9.5	8	Cyp. 3264	311.93	4386	429.71	5162	507.05
					Y. P. 4299	239.94	5680	330.54	6715	390.03
106	13146	"	11.5	10	Cyp. 3835	365.39	5123	500.13	6005	588.47
					Y. P. 5020	281.07	6598	384.72	7780	452.67
107	15449	"	13.5	12	Cyp. 4382	416.84	5825	568.35	6822	667.68
					Y. P. 5714	320.64	7490	437.19	8819	513.60
108	16600	"	15.5	14	Cyp. 5038	478.10	6643	646.58	7752	757.14
					Y. P. 6517	367.77	8493	497.37	9972	582.42
109	11631	14.6	9.5	8	Cyp. 3403	325.22	4576	448.38	5386	529.11
					Y. P. 4546	250.17	5929	344.91	7009	407.01
110	14102	"	11.5	10	Cyp. 3996	380.72	5333	521.09	6260	613.47
					Y. P. 5232	292.86	6877	400.83	8113	471.90
111	16573	"	13.5	12	Cyp. 4560	432.68	6065	591.68	7107	695.52
					Y. P. 5949	332.60	7801	455.13	9190	535.02
112	21761	15.6	15.5	14	Cyp. 5705	540.23	7515	730.32	8768	855.23
					Y. P. 7376	415.56	9603	561.78	11274	657.87
113	11155	16.0	7.5	7	Cyp. 3308	316.14	4456	436.65	5250	515.82
					Y. P. 4670	243.18	5781	335.88	6840	396.78
114	12659	"	8.5	7	Cyp. 3561	340.40	4802	470.69	5659	556.14
					Y. P. 4707	261.84	6233	362.07	7376	427.80
115	14163	"	9.5	8	Cyp. 3872	369.60	5204	509.42	6125	600.19
					Y. P. 5102	284.31	6741	391.86	7968	462.45
116	17171	"	11.5	10	Cyp. 4578	435.05	6093	585.09	7141	698.57
					Y. P. 5976	334.65	7840	456.99	9838	537.36

LIST PRICES OF ROUND TANKS CYPRESS AND YELLOW PINE

Price quoted for White Pine and Yellow Poplar on Application.

No.	Gals.	Bot'm	Inside	No.	Cyp.	2 Inch		2½ Inch		3 Inch	
		Dia.	Depth			Ship-	Price	Ship-	Price	Ship-	Price
		Ft. In.	Ft. In.			ping	f. o. b.	ping	f. o. b.	ping	f. o. b.
						Wgt.	fac-	Wgt.	fac-	Wgt.	fac-
						Lbs.	tory	Lbs.	tory	Lbs.	tory
117	20179	16.0	13.5	12	Cyp.	5319	\$503.81	7018	\$682.19	8193	\$799.26
					Y. P.	6885	387.54	8977	524.76	10543	614.82
118	23187	"	15.5	14	Cyp.	6062	572.72	7941	770.01	9244	899.88
					Y. P.	8299	440.55	10111	592.32	11848	692.22
119	26195	"	17.5	17	Cyp.	6827	643.35	8891	899.58	10320	1,049.88
					Y. P.	8732	494.88	11272	691.98	13177	807.60
120	29203	"	19.5	20	Cyp.	7661	719.79	10774	1,043.72	11464	1,216.26
					Y. P.	9734	553.68	12502	802.86	14575	935.58
121	15988	17.0	9.4	8	Cyp.	4266	406.11	5706	568.62	6705	670.22
					Y. P.	5598	312.39	7369	437.40	8701	515.55
122	19384	"	11.4	10	Cyp.	5017	476.00	6652	658.95	7784	774.08
					Y. P.	6526	366.15	8539	506.88	10048	595.44
123	22639	"	13.4	12	Cyp.	5771	546.00	7601	749.39	8868	878.09
					Y. P.	7460	420.00	9712	576.45	11401	675.45
124	26035	"	15.4	14	Cyp.	6532	618.69	8554	881.33	9958	984.51
					Y. P.	8401	475.92	10889	677.94	12761	757.32
125	29431	"	17.4	17	Cyp.	7398	696.15	9615	982.14	11152	1,145.75
					Y. P.	9447	535.50	12174	755.49	14223	881.34
126	18924	18.0	9.4	8	Cyp.	4672	445.43	6226	621.23	7301	730.91
					Y. P.	6106	342.63	8019	477.87	9453	562.23
127	21730	"	11.4	10	Cyp.	5442	517.49	7201	714.82	8420	838.89
					Y. P.	7065	398.07	9231	549.87	10857	645.20
128	25378	"	13.4	12	Cyp.	6247	592.65	8211	811.47	9572	949.70
					Y. P.	8062	455.88	10478	624.21	12293	730.53
129	29184	"	15.4	15	Cyp.	7128	676.02	9299	916.62	10800	1,068.72
					Y. P.	9132	520.02	11804	705.09	13805	822.09
130	32990	"	17.4	18	Cyp.	8050	759.48	10426	1,065.99	12071	1,241.33
					Y. P.	10243	584.22	13168	819.99	15361	954.87
131	36796	"	19.4	21	Cyp.	9126	856.27	11707	1,239.57	13719	1,465.43
					Y. P.	11511	659.43	14686	953.52	17368	1,127.25

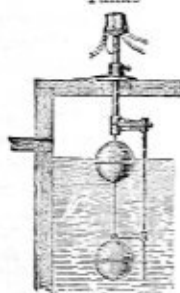
PRICES FOR PLAIN CONICAL COVERS

Cover for Tank	With Battens Over Joints		With Rubber- oid Roofing		With Shingles		With Rubberoid Roofing and Flat Cover		With Cypress Shingles and Flat Cover	
Diameter	Wgt. lbs.	Price	Wgt. lbs.	Price	Wgt. lbs.	Price	Wgt. lbs.	Price	Wgt. lbs.	Price
5 ft. 0 in.	180	\$ 13.65	195	\$ 20.67	342	\$ 21.45	301	\$ 26.16	449	\$ 26.91
6 ft. 6 in.	200	15.15	217	22.95	380	23.85	335	29.01	498	29.91
8 ft. 0 in.			327	34.38	540	35.52	482	42.33	695	43.47
10 ft. 0 in.			485	45.45	750	46.89	734	61.29	999	62.73
12 ft. 6 in.			832	62.10	1175	64.02	1271	83.55	1614	86.55
14 ft. 0 in.			1117	74.91	1500	77.07	1657	103.44	2040	105.60
16 ft. 0 in.			1249	98.31	1810	101.46	1942	133.89	2503	137.04
18 ft. 0 in.			1612	118.17	2300	121.98	2467	162.06	3135	165.87
19 ft. 6 in.			1926	136.95	2625	140.91	2948	189.39	3647	193.35
22 ft. 0 in.			2161	176.88	3200	182.64	3631	244.80	4670	250.56
24 ft. 0 in.			2491	232.08	4040	240.45	4221	312.00	5770	320.37
26 ft. 0 in.			2991	288.06	5050	298.89	4864	374.58	6923	385.45
28 ft. 0 in.			3716	356.40	6350	370.11	5991	457.35	8535	471.06
30 ft. 0 in.			4750	452.13	8100	469.41	7425	576.03	10775	593.31

Not made
with battens
over 6 ft. 6 in.
diameter.

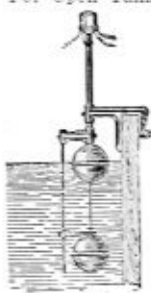
INDICATOR GAUGE AND FLOAT FOR WOOD TANKS

For Tanks 6 ft. and less in height	.....	\$ 7.50
For Tanks 7 ft. to 8 ft. in height (inclu.)	.....	8.00
For Tanks 9 ft. to 10 ft. in height (inclu.)	.....	8.50
For Tanks 11 ft. to 12 ft. in height (inclu.)	.....	9.00
For Tanks 13 ft. to 14 ft. in height (inclu.)	.....	9.50
For Tanks 15 ft. to 16 ft. in height (inclu.)	.....	10.00
For Tanks 17 ft. to 18 ft. in height (inclu.)	.....	10.50
For Tanks 19 ft. to 20 ft. in height (inclu.)	.....	11.00
For Tanks 21 ft. to 22 ft. in height (inclu.)	.....	11.50
For Tanks 23 ft. to 24 ft. in height (inclu.)	.....	12.00
For Tanks 25 ft. to 26 ft. in height (inclu.)	.....	12.50
Extra for open top steel tank	.....	1.00
Extra for steel tank with cover	.....	1.00

High and Low
Water Floats
For Closed
Tanks

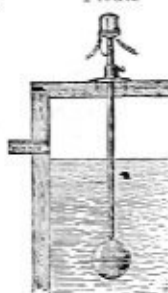
No. 1

FIG. 1054

High and Low
Water Floats
For Open Tanks

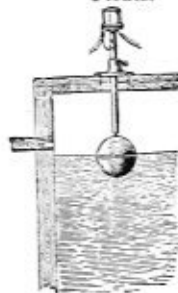
No. 2

FIG. 1055

Low Water
Floats

No. 3

FIG. 1056

High Water
Floats.

No. 4

FIG. 1057

No. 1. For High and Low, closed tank, with one foot of stem	.....	\$22.40
No. 2. For High and Low, open tank, with one foot of stem	.....	23.40
No. 3. For Low Water, open or closed tank, with one foot of stem	.....	12.00
No. 4. For High Water, open or closed tank, with one foot of stem	.....	13.00
Extra lengths on single or double floats	.....	per foot .75

TANK FIXTURES

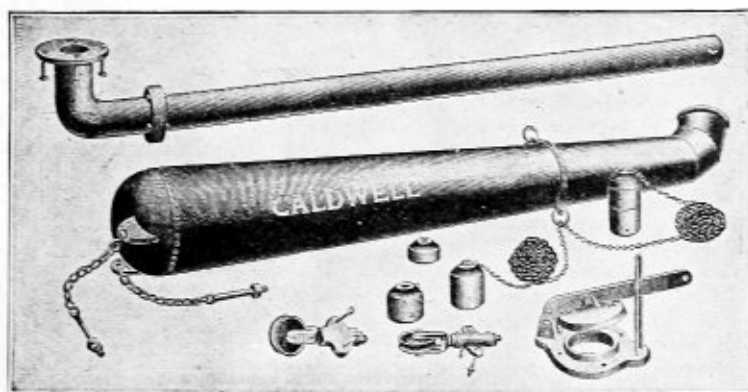


FIG. 1058

	4 in.	6 in.	7 in.	8 in.	10 in.
Fixtures for 10 to 14 ft. diameter Tank	\$105.98	\$144.00	\$170.00	.....	.....
Fixtures for 16 ft. diameter Tank	125.97	154.02	180.00	205.00	230.00
Fixtures for 20 ft. diameter Tank	.....	164.01	190.02	215.00	240.00
Fixtures for 24 ft. diameter Tank	.....	174.00	200.01	225.01	250.01
Fixtures for 30 ft. diameter Tank	.....	195.00	215.01	235.02	260.01

TANKS AND TOWERS

WATER WORKS FOR COUNTRY HOMES



FIG. 1059

We supply these tank and tower outfits without a windmill where some other power is to be used for filling the tank.

They are ornamental as well as substantial and durable.

No country home, however humble, is complete without a Caldwell tank and tower, which gives full benefit of city water service to house, grounds, stock and for fire protection. First cost small, no expense for repairs. Outfit strong, durable, handsome; stands any storm, lasting a life time.

Outfit illustrated is combined tank, tower and windmill, suitable for house of five or six rooms, a few head of stock and sprinkling lawns. Tank holds up to 3000 gallons.

This cut represents our 63-foot Steel Tower and 30,000 Gallons Cypress Tank.

SECTIONAL ROUND COLUMN
STEEL TOWERS

This cut illustrates our 4-column patent steel tower, which we build in sections, suitable to support tanks of dimensions up to and including 20 feet in diameter and of 40,000 gallons capacity.

These towers are strong, durable and attractive in appearance, and cost much less than steel or iron towers of any other design, and, when durability and strength are considered, they are much cheaper than any all-wooden structures.

This style of tower is used extensively in connection with automatic sprinkler plants, for protection against fire in mills, factories and other large buildings, as whenever a large storage of water is kept on hand, elevated and ready for use, it greatly reduces the fire risk and consequently lessens the cost of insurance. They are also largely used by gardeners and florists for irrigation, and also for water supplies for small villages and private grounds.

See prices of towers and estimated cost of foundations on opposite page.



FIG. 1060

TANKS AND TOWERS—CONTINUED

CLASS O

For 1,000 to 1,500 Gallon Tanks

Hght. in Feet	Weight in Pounds	Prices Complete
15	1535	\$121.44
20	1988	169.53
27	2129	185.13
39	2750	252.75
51	3532	339.00
63	4345	424.86
75	5217	516.87

Extra for Steel Girders and Joists.....\$39.00

Estimated cost of Foundations in good ground.....\$22.50

CLASS C

For 10,000 to 12,000 Gallon Tanks

Hght. in Feet	Weight in Pounds	Prices Complete
15	4287	\$306.60
20	4795	364.26
27	5777	452.64
39	7373	607.74
51	9148	784.14
63	10988	963.12
75	12967	1154.40
87	15059	1306.30
100	17288	1569.69

Extra for Steel Girders and Joists.....\$117.00

Estimated cost of Foundations in good ground.....\$48.75

CLASS ES

For 25,000 Gallon Tank

Hght. in Feet	Weight in Pounds	Prices Complete
15	8117	\$581.25
20	8737	655.41
27	10316	824.28
39	12650	1079.28
51	15133	1348.32
63	17863	1633.23
75	20545	1928.70
87	23478	2240.43
100	26560	2566.38

Extra for Steel Girders and Joists.....\$210.00

Estimated cost of Foundations in good ground.....\$87.50

CLASS A

For 2,000 to 3,000 Gallon Tanks

Hght. in Feet	Weight in Pounds	Prices Complete
15	2022	\$153.18
20	2638	217.47
27	2776	232.71
39	3581	316.59
51	4515	416.07
63	5450	514.80
75	6458	619.56
87	7783	751.32

Extra for Steel Girders and Joists.....\$39.00

Estimated cost of Foundations in good ground.....\$30.00

CLASS D

For 15,000 to 17,000 Gallon Tanks

Hght. in Feet	Weight in Pounds	Prices Complete
15	5601	\$395.70
20	6264	462.21
27	7367	567.93
39	9229	747.93
51	11210	939.66
63	13312	1147.43
75	15535	1355.43
87	17827	1579.28
100	20344	1815.75

Extra for Steel Girders and Joists.....\$195.00

Estimated cost of Foundations in good ground.....\$60.00

CLASS F

For 30,000 to 33,000 Gallon Tanks

Hght. in Feet	Weight in Pounds	Prices Complete
15	10127	\$710.19
20	11194	830.19
27	12658	988.02
39	15325	1278.96
51	18145	1584.51
63	21110	1904.16
75	24232	2237.43
87	27499	2588.55
100	30925	2948.94

Extra for Steel Girders and Joists.....\$323.70

Estimated cost of Foundations in good ground.....\$90.00

CLASS B

For 5,000 to 6,000 Gallon Tanks

Hght. in Feet	Weight in Pounds	Prices Complete
15	2826	\$205.14
20	3204	253.50
27	3879	312.42
39	5011	426.78
51	6290	539.42
63	7614	653.24
75	9016	835.41
87	10531	986.58
100	11947	1025.33

Extra for Steel Girders and Joists.....\$48.75

Estimated cost of Foundations in good ground.....\$37.50

CLASS E

For 20,000 to 22,000 Gallon Tanks

Hght. in Feet	Weight in Pounds	Prices Complete
15	7462	\$547.71
20	8082	621.87
27	9661	790.74
39	11995	1045.74
51	14478	1314.81
63	17208	1599.69
75	19890	1895.16
87	22822	2206.59
100	25905	2532.84

Extra for Steel Girders and Joists.....\$195.00

Estimated cost of Foundations in good ground.....\$75.00

CLASS FS

For 35,000 Gallon Tank.

Hght. in Feet	Weight in Pounds	Prices Complete
15	11439	\$898.95
20	12776	1044.93
27	14690	1246.05
39	18077	1606.23
51	21617	1980.48
63	25302	2370.00
75	29144	2772.51
87	33131	3192.87
100	37277	3622.53

Extra for Steel Joists.....\$180.00

Estimated cost of Foundations in good ground.....\$105.00

Prices include Longleaf Yellow Pine Girders, Joists and Walkway with Iron Hand-rail and Ladder, except Classes FS and G, which have Steel Girders instead of Wood. Note extra price for Steel Girders and Joists.

Heights are standard and are from ground or grade line to bottom of tank.

On all towers a ladder is supplied from 3 feet above the top of the tank to 13 feet above the ground.

Prices do not include tank.

GALVANIZED STEEL TANKS



FIG. 1061
ROUND END PRICE LIST

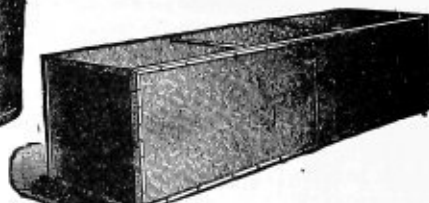


FIG. 1062
SQUARE END PRICE LIST

No.	L'gth Feet	W'th Feet	Ht. Feet	Capa- city Gals.	List Price 20 Gal.	No.	L'gth Feet	W'th Feet	Ht. Feet	Capa- city Gals.	List Price 20 Gal.
300	4	1-6	1	40	\$ 9.75	400	4	1	1	29	\$10.73
301	4	2	1	50	10.73	401	4	2	1	58	12.68
302	4	2	2	91	14.85	402	4	2	2	101	15.69
303	5	1-6	1	50	12.23	403	5	1	1	37	12.23
304	5	2	1	70	12.98	404	5	2	1	74	14.63
305	5	2	1-6	105	15.60	405	5	2	2	148	18.53
306	5	2	2	140	16.95	406	6	2	1	89	16.58
307	6	2	1	80	14.63	407	6	2	2	152	19.38
308	6	2	1-6	120	17.55	408	8	1	1	58	16.58
309	6	2	2	144	18.99	409	8	2	1	119	20.48
310	7	2	2	171	21.98	410	8	2	2	202	26.40
311	8	1-6	1	80	17.10	411	8	2	2-6	253	35.10
312	8	2	1	110	18.53	412	8	2-6	2	262	28.89
313	8	2	1-6	165	21.45	413	8	3	2	318	30.93
314	8	2	2	197	23.52	414	8	3	2-6	397	39.98
315	8	2	2-6	246	27.30	415	8	4	2	424	37.95
316	8	2-6	2	145	25.35	416	8	4	2-6	530	48.75
317	8	2-6	2-6	306	29.25	417	8	4	3	636	51.48
318	8	3	2	298	28.05	418	10	2	1	149	24.38
319	8	3	2-6	372	31.20	419	10	3	2	397	36.20
320	8	4	2	386	30.54	420	10	3	2-6	496	47.78
321	8	4	2-6	482	39.00	421	10	3	3	595	52.20
322	8	4	3	578	42.90	422	10	4	2	530	41.25
323	8	6	2	740	44.85	423	10	4	2-6	662	56.10
324	8	6	2-6	925	50.70	424	10	4	3	795	61.95
325	10	2	1	140	23.40	425	16	4	2	945	67.65
326	10	2	1-6	210	27.30						
327	10	2	2	280	29.25						
328	10	2-6	2	378	32.76						
329	10	3	2	384	32.19						
330	10	3	2-6	480	39.00						
331	10	3	3	576	46.32						
332	10	4	2	496	37.95						
333	10	4	2-6	620	46.80						
334	10	4	3	744	55.58						
335	10	4	5	1240	79.95						
336	10	6	2	897	53.63						
337	10	6	2-6	1121	57.53						
338	10	6	3	1345	63.38						
339	10	6	4	1793	85.80						
340	10	6	5	2241	105.30						
341	12	4	2	693	50.22						

We can furnish these Tanks in any size wanted. We also build Steel Tanks of all sizes and kinds.

GALVANIZED STEEL TANKS



FIG. 1063

These capacities are not meant to be absolutely exact, but reasonably close. Measurements all outside.

Prices do not include covers. When required they will be supplied at proportionate additional prices.

List prices of all Tanks are based on No. 20 Gage. For Tanks 6 feet diameter, 6 feet high, to 8 feet diameter, 8 feet high, inclusive, we recommend No. 13 Gage; for Tanks 10 feet diameter, 8 feet high and 10 feet diameter, 10 feet high, No. 16 Gage; for Tanks 12 feet diameter, 10 feet high, and 12 feet diameter, 12 feet high, No. 14 Gage. Larger Tanks No. 12 and No. 10 Gage. No. 18 Gage increases the price 30 per cent; No. 16, 60 per cent; No. 14, 90 per cent; No. 12, 140 per cent; No. 10, 200 per cent.

No.	SIZE		Capacity Gallons	List Price for 20 Ga.
	Dia. ft.	Ht. ft.		
200	2	2	47	\$ 7.44
201	2½	2½	78	11.55
202	3	2	91	14.85
203	3	3	157	18.99
204	3	4	220	22.29
205	4	2	166	18.15
206	4	2½	215	20.63
207	4	3	254	23.10
208	4	4	338	27.24
209	4	5	423	31.35
210	4	6	508	36.30
211	4	8	688	46.20
212	5	2	262	23.93
213	5	2½	342	26.40
214	5	3	411	28.88
215	5	4	500	34.65
216	5	5	675	42.09
217	5	6	810	47.85
218	5	8	1096	59.40
219	6	2	384	30.53
220	6	2½	480	33.00
221	6	3	583	35.48
222	6	4	786	42.90
223	6	5	1000	49.50
224	6	6	1200	66.00
225	6	8	1600	80.85
226	6½	6½	1500	73.11
227	8	2	691	46.20
228	8	2½	864	49.50
229	8	5	2000	82.50
230	8	6	2400	92.40
231	8	8	3000	118.80
232	8	10	3592	133.65
233	10	2	1089	64.35
234	10	2½	1361	69.30
235	10	8	4500	156.75
236	10	10	6000	181.50
237	10	12	7000	214.50

THE CALDWELL IMPROVED BALANCED
FLOAT VALVE

List Prices

¾ inch	\$ 6.00
1 "	7.50
1¼ "	9.00
1½ "	10.75
2 "	18.75
2½ "	24.00
3 "	33.75
4 "	52.50
5 "	82.50
6 "	122.50

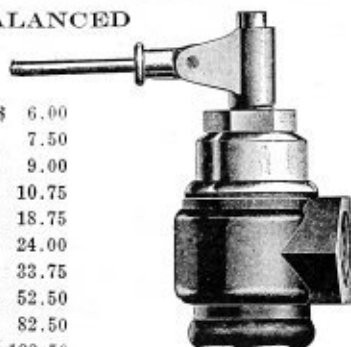


FIG. 1064

MALLEABLE TANK FASTENERS

Double



FIG. 1065

FIG. 1066

STANDARD LIST PRICE

Size of Lug			Size of Bolt	Price	Weight, Pounds
1 in. Single Bolt			$\frac{7}{16}$ x10	\$0.35	1 $\frac{1}{2}$
1 $\frac{1}{4}$	"	"	$\frac{1}{2}$ x13	.40	2
1 $\frac{1}{2}$	"	"	$\frac{1}{2}$ x13	.40	2
1 $\frac{3}{4}$	"	"	$\frac{5}{8}$ x14 E. H.	.50	2 $\frac{3}{4}$
1 $\frac{3}{4}$	"	"	$\frac{1}{2}$ x13	.50	2 $\frac{3}{4}$
2	"	"	$\frac{5}{8}$ x14 E. H.	.60	3 $\frac{1}{2}$
2	"	"	$\frac{3}{4}$ x14	.60	3 $\frac{1}{2}$
2 $\frac{1}{2}$	"	"	$\frac{3}{4}$ x18 E. H.	.80	6 $\frac{1}{4}$
2 $\frac{1}{2}$	"	"	$\frac{5}{8}$ x16	.80	6 $\frac{1}{4}$
3	"	"	$\frac{3}{4}$ x18 E. H.	1.00	7
3	"	"	$\frac{3}{4}$ x18	1.00	7
3 $\frac{1}{2}$	"	"	$\frac{7}{8}$ x18 E. H. & L. D.	1.50	10
4	"	Double	$\frac{3}{4}$ x18	1.50	10
4 $\frac{1}{2}$	"	"	$\frac{3}{4}$ x18	2.00	14
5	"	"	$\frac{3}{4}$ x18 E. H. & L. D.	2.50	18
5	"	"	$\frac{7}{8}$ x18	3.00	20
5 $\frac{1}{2}$	"	"	$\frac{7}{8}$ x18 L. D.	3.00	20
6	"	"	$\frac{7}{8}$ x20	3.25	23
6	"	"	$\frac{7}{8}$ x20	3.50	26
6	"	"	1 x20 E. H. & L. D.	4.00	31

The 4-inch and larger size Lugs are made with two bolts.

Always state thickness of iron to be used when ordering, as it will enable us to ship you a better fitting Lug.

Abbreviations: E. H. (Extra Heavy). L. D. (For Large Diameter).

Specify the "L. D." Lug for tanks of 24 ft. and larger diameter.

Always state width and thickness of Band when ordering.



FIG. 1067

ROUND IRON LUGS

MADE OF MALLEABLE

Size, Inches	Length, Inches	Weight Per 100 Pieces, Lbs.	Size, Inches	Length, Inches	Weight Per 100 Pieces, Lbs.
$\frac{1}{2}$	4	78	1 $\frac{1}{8}$	6 $\frac{3}{8}$	364
$\frac{5}{8}$	4 $\frac{3}{8}$	100	1 $\frac{1}{4}$	6 $\frac{5}{8}$	460
$\frac{3}{4}$	4 $\frac{1}{2}$	142	1 $\frac{3}{8}$	7 $\frac{1}{2}$	700
$\frac{7}{8}$	5 $\frac{5}{8}$	228	1 $\frac{1}{2}$	7 $\frac{1}{2}$	700
1	5 $\frac{3}{4}$	252			

All sizes of Round Lugs are designed like cut above; standard weight Lugs are closed face with core cut through on bottom side.

THE "COLLINS" TUBE EXPANDER

Will answer for any thickness of tube sheet. Powerful, rapid, economical.



FIG. 1068

Collins Self Feed Roller Tube Expander. Needs no hammering; gives smooth, even expansion, with great rapidity. Compact, convenient, and powerful. Made entirely of hardened and tempered steel. Used by hand or power.

PRICE LIST, OUTSIDE DIAMETER OF TUBES

Size	inch	1¼	1½	1¾	1⅞	2	2¼	2½
Price		\$12.00	12.00	14.00	14.00	15.00	18.00	20.00
Size	inch	2¾	3	3¼	3½	3¾	4	4½
Price		\$21.00	22.00	24.00	28.00	30.00	35.00	45.00

THE PITTSBURGH ROLLER TUBE EXPANDER



FIG. 1069

SIZES REFER TO OUTSIDE DIAMETERS OF TUBES

Size	1	1¼	1½	1¾	1⅞	2	2¼	2½	2¾
Price.....each	\$10.00	10.00	10.00	10.00	10.00	10.00	12.00	14.00	16.00
Weight .....pounds	1	1½	2¼	3	4½	4¾	6½	8	8¾
Size	3	3¼	3½	3¾	4	4¼	4½	5	6
Price.....each	\$18.00	20.00	23.00	25.00	30.00	35.00	40.00	50.00	60.00
Weight .....pounds	11	15¾	18¼	23	25	30	35	45	55

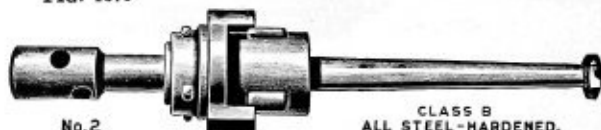
HENDERER'S ROLLER TUBE EXPANDERS



FIG. 1070

Class "A"
Malleable Iron
A Good Tool at a
Low Price
for Light Repairs.

Class B.
Something Better
than the Class A
for Heavy Duty.



No. 2

FIG. 1071

CLASS B
ALL STEEL-HARDENED.

SIZES REFER TO OUTSIDE DIAMETERS OF TUBES

Size	1	1 1/4	1 1/2	1 3/4	1 7/8	2	2 1/4	2 1/2	2 3/4
A or B .....each	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$12.00	\$14.00	\$16.00
Weight .....pounds	1	1 1/2	2 1/4	3	4 1/2	4 3/4	6 1/2	8	8 3/4
Size	3	3 1/4	3 1/2	3 3/4	4	4 1/4	4 1/2	5	6
A or B .....each	\$18.00	\$20.00	\$23.00	\$25.00	\$30.00	\$35.00	\$40.00	\$50.00	\$60.00
Weight .....pounds	11	15 3/4	18 1/4	23	25	30	35	45	55

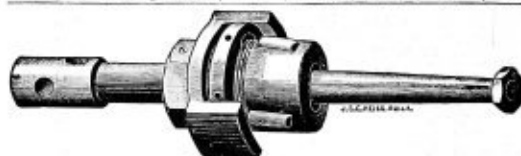


FIG. 1072

Class H.
The Very Best Tool
on the Market.
Patent Self-feed for
Hand or Power Use.
All Steel, Hardened.

SIZES REFER TO OUTSIDE DIAMETERS OF TUBES

Size .....inches	1	1 1/4	1 1/2	1 3/4	1 7/8	2	2 1/4	2 1/2	2 3/4
Price .....each	\$12.00	\$12.00	\$12.00	\$14.00	\$15.00	\$16.00	\$18.00	\$20.00	\$23.00
Size .....inches	3	3 1/4	3 1/2	3 3/4	4	4 1/4	4 1/2	5	6
Price .....each	\$26.00	\$29.00	\$32.00	\$35.00	\$38.00	\$41.00	\$44.00	\$50.00	\$60.00

Class G.
For Water Tube
Boilers.

All Steel, Hardened.



No. 7

FIG. 1073

CLASS G

For water tube boilers that require an Expander to pass the hand holes same size as the tubes.

Prices are for 4-inch size. Other sizes made special.

Body only, with one set each of straight and taper rolls.....	\$30.00
Short square head mandrel.....	\$ 4.00
Long Straight mandrel.....	10.00
Single Joint mandrel	12.00
Double Joint mandrel	14.00

All of above sizes refer to outside diameters of ends of tubes.

TUBE EXPANDERS

Note:—List price shows smallest inside diameter any expander passes into and what it will expand to, enabling you to select an expander with proper range regardless if used on straight tubes, swedged tubes or pipe.

STANDARD ROLLER EXPANDER

No. 3

(Patented)



FIG. 1074

The rolls and mandrel of this expander are made of good tool steel and tempered. The frame is one piece, always furnishing a good bearing to the guard. It has no collar or pin to get loose or lost throwing tool out of commission. This expander will give good ordinary service.

SIZE OF EXPANDER
For Outside Dia. tubes (in.)Will enter and expand
tubes I. D. from (in.)

Price Complete

Approx. Wgt. boxed (lbs.)

Extra Mandrels Each

Extra Rolls Each

1"	1 1/4"	1 1/2"	1 3/4"	1 7/8"	2"	2 1/4"	2 1/2"	2 3/4"
5/8 to 1"	1 1/8 to 1 1/4"	1 1/4 to 1 1/2"	1 1/2 to 1 3/4"	1 3/4 to 1 7/8"	1 7/8 to 2"	2 to 2 1/4"	2 1/4 to 2 1/2"	2 1/2 to 2 3/4"
\$10.00	10.00	10.00	10.00	10.00	10.00	12.00	14.00	16.00
2 1/2	2 3/4	3	4 1/4	4 1/2	5	6	7 1/2	8 1/2
\$2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.50	3.25
\$.20	.20	.20	.20	.20	.20	.20	.20	.35

SIZE OF EXPANDER
For Outside Dia. tubes (in.)Will enter and expand
tubes I. D. from (in.)

Price Complete

Approx. Wgt. boxed (lbs.)

Extra Mandrels Each

Extra Rolls Each

3"	3 1/4"	3 1/2"	3 3/4"	4"	4 1/4"	4 1/2"	5"	6"
2 1/2 to 3"	2 3/4 to 3 1/4"	3 1/4 to 3 1/2"	3 1/2 to 3 3/4"	3 3/4 to 4"	3 3/4 to 4 1/4"	4 1/4 to 4 1/2"	4 1/2 to 5"	5 to 6"
\$18.00	20.00	23.00	25.00	30.00	40.00	50.00	60.00	70.00
10 1/2	14	17	17 1/2	20 1/2	24 1/2	25	34 1/2	49 1/2
\$ 3.75	4.25	4.75	5.50	5.75	6.50	8.50	10.00	11.00
\$.35	.50	.50	.60	.60	.80	.80	1.00	1.75

DAYTON ROLLER EXPANDER

No. 15



FIG. 1075

The rolls and mandrel of this expander are made of the very best tool steel and tempered. The collar and frame is one piece and hardened making it the most economical expander of this class upon the market, having the fewest parts.

SIZE OF EXPANDER
For Outside Dia. tubes (in.)Will enter and expand
tubes I. D. from (in.)

Price Complete

Approx. Wgt. boxed (lbs.)

Extra Mandrels Each

Extra Rolls Each

1"	1 1/8"	1 1/4"	1 3/8"	1 1/2"	1 5/8"	1 3/4"	1 7/8"	2"
5/8 to 1"	1 1/8 to 1 1/4"	1 1/4 to 1 1/2"	1 1/2 to 1 3/8"	1 3/8 to 1 1/2"	1 1/2 to 1 5/8"	1 5/8 to 1 3/4"	1 3/4 to 1 7/8"	1 7/8 to 2"
\$11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00
3	3	3 1/2	3 1/2	4	5	5 1/2	5 1/2	6
\$ 3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
\$.30	.30	.30	.30	.30	.30	.30	.30	.30

SIZE OF EXPANDER
For Outside Dia. tubes (in.)Will enter and expand
tubes I. D. from (in.)

Price Complete

Approx. Wgt. boxed (lbs.)

Extra Mandrels Each

Extra Rolls Each

2 1/8"	2 1/4"	2 3/8"	2 1/2"	2 3/4"	3"	3 1/4"	3 1/2"	4"
1 1/2 to 2 1/8"	1 1/2 to 2 1/4"	2 1/4 to 2 3/8"	2 3/8 to 2 1/2"	2 1/2 to 2 3/4"	2 3/4 to 3"	3 to 3 1/4"	3 1/4 to 3 1/2"	3 1/2 to 4"
\$13.00	13.00	15.00	15.00	17.00	17.00	18.00	20.00	22.00
6 1/2	6 1/2	7	7 1/2	8 1/2	13	13 1/2	16	23
\$ 3.50	3.50	4.50	4.50	4.50	5.50	5.50	6.50	7.50
\$.30	.30	.30	.30	.60	.60	.70	.70	.80

TUBE EXPANDERS

Notes.—List price shows smallest inside diameter any expander passes into and what it will expand to, enabling you to select an expander with proper range regardless if used on straight tubes, swaged tubes or pipe.

IDEAL ALL STEEL EXPANDER

No. 36



FIG. 1076

(Patented) The rolls, detachable mandrel, frame and guard of this expander are made of the very best tool steel and tempered. Rolls cannot fall to inside or outside of frame when mandrel is removed; rolls are double length and reversible. Guaranteed to be strictly the highest grade and is for hand use only. Will do for any thickness tube sheet.

SIZE OF EXPANDER For Outside Dia. tubes (in.)		1 1/2"	1 5/8"	1 3/4"	1 7/8"	2"	2 1/8"	2 1/4"	2 3/8"	2 1/2"
Will enter and expand tubes I. D. from (in.)		1 1/2 to 1 1/2"	1 1/2 to 1 1/2"	1 1/2 to 1 1/2"	1 1/2 to 1 1/2"	1 1/2 to 2"	1 1/2 to 2 1/8"	1 1/2 to 2 1/4"	1 1/2 to 2 3/8"	1 1/2 to 2 1/2"
Price	Complete	\$16.00	16.00	16.00	16.00	16.00	18.00	18.00	19.50	19.50
Approx. Wgt. boxed (lbs.)		4 1/2	6 1/2	7	7 1/2	8	8 1/2	9	10 1/2	11
Extra Mandrels	Each	\$ 3.50	3.50	3.50	3.50	3.50	3.50	3.50	4.50	4.50
Extra Rolls	Each	\$.30	.30	.30	.30	.30	.30	.30	.30	.30

SIZE OF EXPANDER For Outside Dia. tubes (in.)		2 5/8"	2 3/4"	3"	3 1/4"	3 1/2"	3 3/4"	4"	4 1/4"	4 1/2"
Will enter and expand tubes I. D. from (in.)		2 5/8 to 2 5/8"	2 5/8 to 2 5/8"	2 5/8 to 3"	2 5/8 to 3 1/4"	2 5/8 to 3 1/2"	2 5/8 to 3 3/4"	2 5/8 to 4"	2 5/8 to 4 1/4"	2 5/8 to 4 1/2"
Price	Complete	\$22.00	22.00	22.00	24.50	24.50	27.00	27.00	40.00	50.00
Approx. Wgt. boxed (lbs.)		13 1/2	14 1/2	17	18 1/2	21	23	28	31	32
Extra Mandrels	Each	\$ 4.50	4.50	5.50	5.50	6.50	6.50	7.50	10.00	10.00
Extra Rolls	Each	\$.60	.60	.60	.70	.70	.80	.80	1.10	1.10

IDEAL ALL STEEL SELF FEED EXPANDER

No. 40



FIG. 1077

This embodies all the features and guarantee mentioned in detail on the above, only it is self feeding and for power use; can also be used by hand. Furnished with frictionless phosphor bronze bearing, impossible to get out of order, reducing friction to a minimum.

All expanders have a right hand feed and furnished with standard, detachable combination square shank mandrels.

SIZE OF EXPANDER For Outside Dia. tubes (in.)		1"	1 1/8"	1 1/4"	1 3/8"	1 1/2"	1 5/8"	1 3/4"	1 7/8"	2"
Will enter and expand tubes I. D. from (in.)		3/4 to 1"	1 to 1 1/8"	1 1/4 to 1 1/4"	1 3/8 to 1 1/2"	1 1/2 to 1 1/2"	1 5/8 to 1 5/8"	1 3/4 to 1 3/4"	1 7/8 to 1 7/8"	2 to 2"
Price	Complete	\$16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00
Approx. Wgt. boxed (lbs.)		3 1/2	4	4	4 1/2	4 1/2	6 1/2	7	7 1/2	8
Extra Mandrels	Each	\$ 3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
Extra Rolls	Each	\$.30	.30	.30	.30	.30	.30	.30	.30	.30

SIZE OF EXPANDER For Outside Dia. tubes (in.)		2 1/8"	2 1/4"	2 3/8"	2 1/2"	2 5/8"	2 3/4"	3"	3 1/4"	3 1/2"
Will enter and expand tubes I. D. from (in.)		1 1/2 to 2 1/8"	1 1/2 to 2 1/4"	1 1/2 to 2 3/8"	1 1/2 to 2 1/2"	1 1/2 to 2 5/8"	1 1/2 to 2 3/4"	1 1/2 to 3"	1 1/2 to 3 1/4"	1 1/2 to 3 1/2"
Price	Complete	\$18.00	18.00	19.50	19.50	22.00	22.00	22.00	24.50	24.50
Approx. Wgt. boxed (lbs.)		8 1/2	9	10 1/2	11	13 1/2	14 1/2	17	18 1/2	21
Extra Mandrels	Each	\$ 3.50	3.50	4.50	4.50	4.50	4.50	5.50	5.50	6.50
Extra Rolls	Each	\$.30	.30	.30	.30	.60	.60	.60	.70	.70

SIZE OF EXPANDER For Outside Dia. tubes (in.)		3 3/4"	4"	4 1/4"	4 1/2"	4 3/4"	5"	5 1/4"	5 1/2"	6"
Will enter and expand tubes I. D. from (in.)		3 to 3 3/4"	3 to 4"	3 to 4 1/4"	3 to 4 1/2"	3 to 4 3/4"	3 to 5"	3 to 5 1/4"	3 to 5 1/2"	3 to 6"
Price	Complete	\$27.00	27.00	40.00	50.00	55.00	55.00	60.00	60.00	65.00
Approx. Wgt. boxed (lbs.)		23	28	31	32	35	39 1/2	40 1/2	51	55
Extra Mandrels	Each	\$ 6.50	7.50	10.00	10.00	15.00	15.00	18.00	18.00	20.00
Extra Rolls	Each	\$.80	.80	1.10	1.10	2.00	2.00	2.50	2.50	3.00

TUBE EXPANDERS

Note:—List price shows smallest inside diameter any expander passes into, enabling you to select an expander with proper range regardless if used on straight tubes, swedged tubes or pipe.

STANDARD SECTIONAL EXPANDER



FIG. 1078

This expander is made completely of steel and hardened. It is for hand use only. Used mostly on fire boxes of thresher engines and for repair work and gives good ordinary service. When ordering always state thickness of tube sheet; $\frac{3}{8}$ " plate for $\frac{3}{8}$ " thickness tube sheet and $\frac{1}{2}$ " plate for $\frac{1}{2}$ " thickness tube sheet carried in stock. All other plates are special.

SIZE OF EXPANDER For Outside Dia. tubes (in.)		1"	1 $\frac{1}{4}$ "	1 $\frac{1}{2}$ "	1 $\frac{3}{4}$ "	2"	2 $\frac{1}{4}$ "
Will enter and expand tubes I. D. (in.)		$\frac{27}{32}$ "	1 $\frac{1}{8}$ "	1 $\frac{1}{4}$ "	1 $\frac{1}{2}$ "	1 $\frac{3}{4}$ "	1 $\frac{7}{8}$ "
Price Complete		\$12.00	12.00	12.00	12.00	12.00	13.00
Approx. Wgt. boxed (lbs.)		3	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$	5	5 $\frac{1}{2}$
Extra Round Pins Each		\$ 2.50	2.50	2.50	2.50	2.50	2.50
Extra Coil Steel Springs Each		\$.40	.40	.40	.40	.40	.40
SIZE OF EXPANDER For Outside Dia. tubes (in.)		2 $\frac{1}{2}$ "	2 $\frac{3}{4}$ "	3"	3 $\frac{1}{4}$ "	3 $\frac{1}{2}$ "	4"
Will enter and expand tubes I. D. (in.)		2 $\frac{1}{2}$ "	2 $\frac{3}{4}$ "	2 $\frac{5}{8}$ "	2 $\frac{7}{8}$ "	3 $\frac{1}{8}$ "	3 $\frac{3}{8}$ "
Price Complete		\$15.00	18.00	22.00	26.00	30.00	33.00
Approx. Wgt. boxed (lbs.)		7	8 $\frac{1}{2}$	9 $\frac{1}{2}$	13 $\frac{1}{2}$	14	16
Extra Round Pins Each		\$ 3.00	5.00	5.00	7.00	7.00	7.00
Extra Coil Steel Springs Each		\$.40	.75	.75	1.00	1.00	1.00

IDEAL SECTIONAL EXPANDER

This form B. sectional expander is made entirely of the very best tool steel and tempered; is for hand and power use. Guaranteed to be strictly the highest grade. Expanders assume a true circle after expanded in full in the tube. All sections are interchangeable. Made with double taper to relieve rear of sections and releasing pin bringing actual working surface together only. We carry in stock $\frac{1}{2}$ ", $\frac{3}{8}$ " and $\frac{5}{8}$ " plate. Plate is the dimension from the bottom to the bottom of the recess, note .

Mention what plate is desired when ordering.

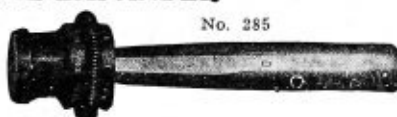


FIG. 1079

SIZE OF EXPANDER For Outside Dia. tubes (in.)		1 $\frac{1}{2}$ "	1 $\frac{5}{8}$ "	1 $\frac{3}{4}$ "	1 $\frac{7}{8}$ "	2"	2 $\frac{1}{8}$ "
Will enter and expand tubes I. D. (in.)		1 $\frac{1}{2}$ "	1 $\frac{3}{8}$ "	1 $\frac{1}{2}$ "	1 $\frac{3}{4}$ "	1 $\frac{3}{4}$ "	1 $\frac{7}{8}$ "
Price Complete		\$12.00	12.00	12.00	12.00	12.00	13.00
Approx. Wgt. boxed (lbs.)		4	4	4 $\frac{1}{2}$	4 $\frac{1}{2}$	5	5
Extra Octagon Pins Each		\$ 3.00	3.00	3.00	3.00	3.00	3.00
Extra Coil Steel Springs Each		\$.40	.40	.40	.40	.40	.40
SIZE OF EXPANDER For Outside Dia. tubes (in.)		2 $\frac{1}{4}$ "	2 $\frac{3}{8}$ "	2 $\frac{1}{2}$ "	3"	3 $\frac{1}{2}$ "	4"
Will enter and expand tubes I. D. (in.)		1 $\frac{1}{2}$ "	2 $\frac{1}{8}$ "	2 $\frac{1}{2}$ "	2 $\frac{5}{8}$ "	3 $\frac{1}{4}$ "	3 $\frac{3}{8}$ "
Price Complete		\$13.00	15.00	15.00	22.00	30.00	33.00
Approx. Wgt. boxed (lbs.)		5 $\frac{1}{2}$	7	7	9 $\frac{1}{2}$	14	16 $\frac{1}{2}$
Extra Octagon Pins Each		\$ 3.00	4.00	4.00	6.00	8.00	8.00
Extra Coil Steel Springs Each		\$.40	.40	.40	.75	1.00	1.00

TUBE EXPANDERS FOR WATER TUBE BOILERS

Note:—List price shows smallest inside diameter any expander passes into and what it will expand to, enabling you to select an expander with proper range regardless if used on straight tubes, swaged tubes or pipe.

All expanders furnished in the self-feeding type, unless order states, wanted for hand use only. Guaranteed to be strictly the highest grade. Will do for any thickness tube sheet.

All expanders have a right hand feed
and furnished with standard detachable
combination square shank mandrels. } Sizes 2" to 2½" inclusive ¾" square.
} Sizes 3" to 4" inclusive 1" square.

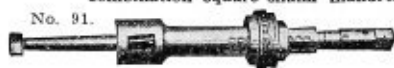


FIG. 1080

The rolls, mandrel, frame and adjustable collar are made of the very best tool steel and tempered. Rolls cannot fall outside of the frame. Made specially for the Heine Safety Water Tube Boiler and similar types, adjustable for all size water legs, maximum range shown in list price.

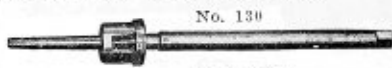


FIG. 1081

The rolls, detachable mandrel and frame are made of the very best tool steel and tempered. Rolls cannot fall to inside or outside of frame when mandrel is removed. Made specially for the Heine Safety Water Tube Boiler and similar types.



FIG. 1082

The rolls, detachable mandrel, frame and guard are made of the very best tool steel and tempered. Rolls cannot fall to inside or outside of frame when mandrel is removed. Rolls are double length and reversible. Made specially for the Sterling Water Tube Boiler and similar types.

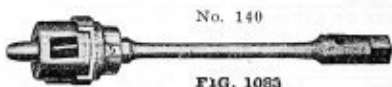


FIG. 1083

The rolls, detachable mandrel, frame and one piece adjustable and reversible guard are made of the very best tool steel and tempered. Rolls cannot fall to inside or outside of frame when mandrel is removed. Made specially for the Babcock & Wilcox Water Tube Boiler and similar types.

No. 91 Made in 9 sizes

SIZE OF EXPANDER For Outside Dia. tubes (in.)	2"	2¼"	2⅜"	2½"	2¾"	3"	3¼"	3½"	4"
Will enter and expand tubes I. D. from (in.)	1½ to 2"	1½ to 2½"	2½ to 2¾"	2½ to 2¾"	2½ to 2¾"	2½ to 3"	2½ to 3½"	3½ to 3½"	3½ to 4"
Price Complete	\$40.00	44.00	45.00	46.00	48.00	48.00	55.00	57.00	60.00
Approx. Wgt. boxed (lbs.)	15½	17	20½	21	23	24	34	38	47
Extra Mandrels Each	\$ 8.00	8.00	11.00	11.00	14.00	14.00	14.00	15.00	16.00
Extra Rolls Each	\$.30	.30	.30	.30	.60	.60	.70	.70	.80
Maximum range through water space	8"	8"	8"	8"	8"	8"	12"	12"	12"

No. 120. Made in 3¼" size. No. 130. Made in 3½" and 4" sizes. No. 140. Made in 4" size.

SIZE OF EXPANDER For Outside Dia. tubes (in.)	No. 120 3¼"	No. 130 3½" 4"	No. 140 4"
Will enter and expand tubes I. D. from (in.)	2½ to 3½"	3½ to 3½" 3½ to 4"	3½ to 4"
Price Complete	\$32.00	32.00 35.00	55.00
Approx. Wgt. boxed (lbs.)	23	25 32	24
Extra Mandrels Each	\$12.00	15.00 16.00	13.00
Extra Rolls Each	\$ 1.00	1.20 1.50	1.00

TUBE CUTTERS

Note.—List price shows smallest inside diameter any tube cutter passes into, enabling you to select a tube cutter with proper range, regardless if used on straight tubes, swaged tubes or pipe.

IDEAL SELF FEED TUBE CUTTER

No. 375

(Patented)



FIG. 1084

FOR HAND USE



Is the only cutter upon the market that solved the problem of cutting off new steel tubes with a bevel ready for beading **without cracking them**, generally caused by turning them outward with a ball-faced hammer. By moving guard back, which requires a minute, you can cut out old tubes inside of boiler head or water tube boiler. (Note illustrations above.) All wearing parts made of steel and tempered, making a first-class tool.

SIZE OF TUBE CUTTER For Outside Dia. tubes (in.)	2"	2 1/4"	2 1/2"	2 3/4"	3"	3 1/4"	3 1/2"	4"	4 1/2"	5"	5 1/2"	6"
Cuts tubes I. D. (in.)	1 1/2"	1 3/4"	2 1/8"	2 1/4"	2 3/8"	2 5/8"	3 1/8"	3 3/8"	4 1/8"	4 3/8"	4 7/8"	5 3/8"
Price Complete	\$15.00	16.00	17.00	18.00	22.00	22.50	23.00	24.00	27.00	29.00	39.50	40.00
Approx. Wgt. boxed (lbs.)	18	19	19 1/2	20	29	29 1/2	31 1/2	33	50 1/2	54	55	55 1/2
Extra Cutters, per piece	\$.30	.30	.30	.30	.30	.30	.30	.30	.60	.80	.80	.80
Extra Cutters, per dozen	\$ 2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	6.00	8.00	8.00	8.00

IDEAL TUBE CUTTER EXTENSION

No. 377



FIG. 1085

Connect proper length extension and you stand upright, outside of a smoke box, vertical, submerged, B. & W. Heine, Sterling Water Tube or any other boilers, enabling you to do more work.

Number of Extension	D-1 1/2"	D-3"	D-6"	D-8"	E-1 1/2"	E-3"	E-6"	E-8"	F-1 1/2"	F-3"
Price Complete	\$4.00	8.50	14.00	16.00	5.00	11.00	16.00	20.00	9.00	20.00
Approx. Wgt. boxed (lbs.)	8 1/2	25	37	49	12	31	41	55	25	35
Length of Extension	19 in.	45 in.	6 ft.	8 ft.	19 in.	38 in.	6 ft.	8 ft.	19 in.	38 in.
Fits Tube Cutters fig 1084.	2", 2 1/4", 2 1/2", 2 3/4"	3", 3 1/4", 3 1/2", 4"	4 1/2", 5", 5 1/2", 6"							

IDEAL R. R. TUBE CUTTER

No. 360



FIG. 1086

FOR POWER USE

Constructed entirely of tool steel designed for power use in Railroad and Boiler Shops. Cuts tubes smooth, clean and square in 1 1/2 revolution. See fig. 1088. Knives made of high speed steel. Shank 1" sq.

SIZE OF TUBE CUTTER For Outside Dia. tubes (in.)	1 3/4"	2"	2 1/4"
Cuts tubes I. D. (in.)	1 1/8"	1 3/8"	1 7/8"
Price Complete	\$55.00	55.00	55.00
Approx. Wgt. boxed (lbs.)	6	6 1/2	7 1/2
Knife, High Speed, per piece	\$ 1.00	1.60	1.00
Knife, High Speed, per doz.	\$ 9.00	9.00	9.00

IDEAL YOKE

No. 365

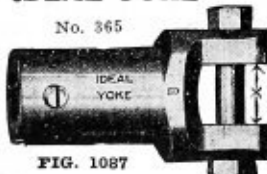


FIG. 1087

Made of special durable steel, enabling you to connect tube cutter fig. 1086 to any kind of power appliance.



FIG. 1088

Number of Yoke	2
Fits the following size tube cutters, FIG. 1086.	1 3/4", 2", 2 1/4"
Price Complete	\$14.00
Approx. Wgt. boxed (lbs.)	6
Square hole in yoke	1"

LAGONDA BOILER TUBE CLEANERS

The Lagonda Thrust Bearing Cleaner is designed for removing heavy and hard scale. It will do faster and more effective work and will last longer than any other water driven cleaner made. These cleaners are designed for 150 lbs. pressure, but they will do very efficient work on less pressure, depending upon scale conditions. They are made for all sizes of tubes—both standard and special.

Lagonda Thrust Bearing Cleaner
Water Driven

FIG. 1089

Catalog and prices sent upon application.

No. W-228 for $3\frac{1}{4}$ " curved tubes.

No. 65 for $3\frac{1}{2}$ " straight tubes.

No. 66 for 4" straight tubes.

Lagonda Air or Steam Driven Cleaner



FIG. 1090

Catalogs giving full description, and prices sent upon application.

No. 79 for $3\frac{1}{4}$ " curved tubes.

No. 80 for $3\frac{1}{2}$ " straight tubes.

No. 81 for 4" straight tubes.

The Lagonda Vibrator Cleaner is especially designed for removing scale from fire tube boilers. The Clover Leaf Vibrator revolves at a high rate of speed, striking a great number of light but firm blows which will dislodge the hardest scale from the outside surface of the tube. These vibrators do not damage the tubes and they can be operated with ordinary rubber hose. It is not necessary to turn or twist the cleaner in the tube, since the action of the vibrator head is rotary. Made for all sizes of tubes.

Lagonda Vibrator Cleaner for Fire Tubes

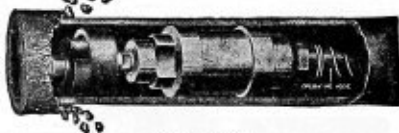


FIG. 1091

Catalog and prices will be sent upon application.

No. D-142 for 3" straight tubes.

No. 80 for $3\frac{1}{2}$ " straight tubes.

No. 81 for 4" straight tubes.

Lagonda Tube Cutter



FIG. 1092

The Lagonda Boiler Tube Cutter is a handy tool, which should be found in every boiler room. This cutter will cut a 4" tube in a minute and make a clean cut without a burr. Extension shafts can be furnished for cutting the tube at any point. These cutters are made for any size tube and any type of boiler.

Special catalog and prices sent upon application.

DEAN BOILER TUBE CLEANERS

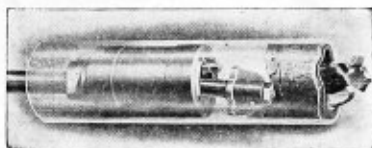
FOR WATER TUBE OR RETURN TUBE BOILERS
OPERATED BY AIR OR STEAMRemoving Scale from Tube of a Water
Tube Boiler.

FIG. 1093

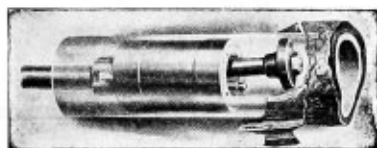
Removing Scale from Tube of a Return
Tube Boiler.

FIG. 1094

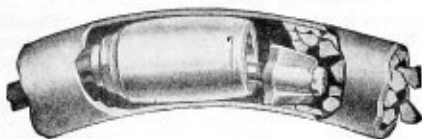
Removing Scale from Tube of a
Stirling Boiler.

FIG. 1095

The Dean operates in either water tube or return tube boilers. The same machine may be used in both types provided the size of the tubes are the same, simply by changing the hammer heads.

It can be equipped with extra attachments, enabling it to operate in two or more different sizes of boiler tubes.

The Dean removes scale by vibration. It delivers from 3,500 to 10,000 taps per minute, with force varying from $1\frac{1}{8}$ to $2\frac{1}{2}$ -foot ounces. The tremor produced by these taps causes the scale to lose its grip and fall.

While these taps are not heavy enough to injure the tubes, they produce enough vibration to dislodge the heaviest and most tenacious scale.

Sectional View, Showing
Mechanism and Interchange-
ability of Hammers.

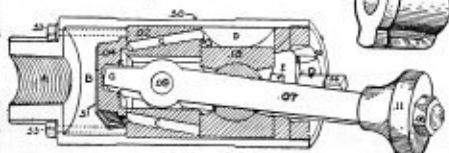


FIG. 1096

Number	3	4	5	6	7
For Tubes	inches 2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price	each \$100.00	100.00	75.00	75.00	75.00
Number	8	8-0	8-1	9	*10 †11
For Tubes	inches $4\frac{1}{2}$	5	$5\frac{1}{2}$	6	.....
Price	each \$80.00	80.00	85.00	90.00	100.00 100.00

*No. 10 for curved tubes. †No. 11 for Locomotive Arch tubes.

When ordering, state whether for water tube or return tube boilers or both. The proper hammer heads will then be furnished with the cleaner.

For return tube boilers two hammer heads for scale and one for soot are furnished.

For water tube boilers two hammer heads are furnished for removing scale from inside of tubes.

"PITTSBURGH TWO WAY" BOILER TUBE CLEANER



FIG. 1097



FIG. 1098

SOOT SUCKER STEAM BLOWER

A quarter turn of the swing joint makes this machine either a sucker or blower, as you wish it, without change of handle or hose.

Used as a soot sucker, there is no steam in the tube, hence, no scale. Placed against the end of the tube, a perfect vacuum is formed, drawing the soot from the tube and forcing it up the stack, away from the plant. No dirt in the boiler room; all goes up the stack; keeps the stack clean, too.

This cleaner can be placed on the handle and fittings of any blower, or a straight piece of pipe, if desired.

LIST PRICE, WITH HANDLE AND FITTINGS

2 inch	\$15.00	3½ inch	\$17.00
2½ inch	16.00	4 inch	17.50
3 inch	16.50	4½ inch	18.00

For heads only, without handles and fittings, deduct \$3.50.

IMPROVED "FAVORITE" STEAM FLUE BLOWER

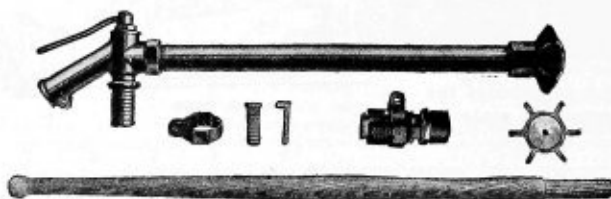


FIG. 1099

The "Favorite" is shipped complete with handle, and coupling, clamp and bands for attaching hose, as shown and is manufactured in the following sizes:

No. of Blower	Size of Tubes, Outside Diameter	Size Steam Hose Required	Price with Clamps and Nipple	No. of Blower	Size of Tubes, Outside Diameter	Size Steam Hose Required	Price with Clamps and Nipple
0	1½ to 1¾ in.	½ in. 4 ply	\$5.00	4	3½ to 3¾ in.	1 in. 4 ply	\$8.75
1	2 to 2¼ in.	½ in. 4 ply	5.00	5	4 to 4½ in.	1¼ in. 4 ply	10.00
2	2½ to 2¾ in.	¾ in. 4 ply	6.25	6	5 to 6 in.	1½ in. 4 ply	12.50
3	3 to 3¼ in.	1 in. 4 ply	7.50				

The above prices for blowers do not include hose and globe valves, which we can furnish of very best quality.

CYCLONE STEAM FLUE CLEANER

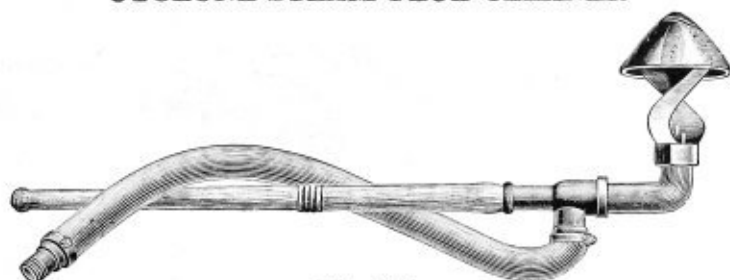


FIG. 1100

Cyclone Steam Flue Cleaner for Upright Boilers



FIG. 1101

Cyclone Steam Flue Cleaner for Horizontal Boilers

DIRECTIONS FOR ORDERING

If for Horizontal Boilers should distance from Tube Sheet to the front of Boiler exceed 18 inches, please give length of fire box.

If for Upright Boilers, give inside diameter of Boiler, and distance from tubes to the bottom of door.

For Locomotive Boilers give length of fire box.

We furnish Steam Hose only when ordered.

OPERATION

It is best to clean the tubes with the full pressure of steam on.

Partly turn on the steam and blow the soot from face of boiler. Close lower doors to shut off the draft; then turn on steam full, allowing Cleaner to remain against the end of each tube a few seconds. Begin at the top and work down.

MAKING CONNECTIONS

Make connections with dome of Boiler to obtain dry steam. Before connecting the Cleaner, see that the opening in end of pipe, also that of globe valve, are equal to that of cleaner pipe. See that the hose is securely fastened to cleaner and coupling.

The steam supply should in all cases be equal and preferably larger than the pipe of cleaner.

Size	Clean following Sizes of Tubes "outside measurement"	Price of Cleaners with Clamps and Couplings each	Price of Extra Cleaner Heads only	Price of Steam Hose per foot—extra	Price of Globe Valves each—extra
No. 0	$\frac{3}{4}$ to $1\frac{1}{4}$ in.	\$12.00	\$ 8.00	$\frac{1}{2}$ in. \$0.63	$\frac{3}{8}$ in. \$1.50
No. 1	$1\frac{1}{4}$ to $2\frac{1}{4}$ in.	13.00	9.00	$\frac{3}{4}$ in. .83	$\frac{1}{2}$ in. 2.00
No. 2	$2\frac{1}{4}$ to $3\frac{1}{2}$ in.	14.00	10.00	$\frac{3}{4}$ in. .83	$\frac{3}{4}$ in. 2.75
No. 3	4 to 5 in.	15.00	11.00	1 in. 1.00	1 in. 3.50

CRISS-CROSS TUBE CLEANER



FIG. 1102

In sending orders, give inside and outside diameter of tubes.

Outside diameter of tube .....inches	1½	1¾	2	2¼	2½	2¾	3	3¼	3½	3¾	4	4½	5	6
Price .....each	\$2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.50	5.00	5.50	6.00	

Without Brush



FIG. 1103

INGALLS BOILER
TUBE CLEANER

WITHOUT BRUSH

Per inch.....\$1.00

COMBINATION
FLUE BRUSH AND
SCRAPER

Per inch.....\$1.25



FIG. 1104

ABRAM'S FLUE
BRUSH

WIRES CANNOT FALL OUT

Sizes 1¾ to 6-inch...per inch, \$1.00

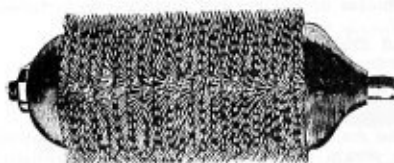


FIG. 1105

HARD SPIRAL FLUE
BRUSH

Sizes 1¾ to 6-in..per inch, \$1.00



FIG. 1106

FINE WIRE BRUSH

Sizes 1¾ to 6-inch..per inch, \$1.00



FIG. 1107

RUGGLES PERFECTION FLUE CLEANER



FIG. 1108

Guaranteed to clean hot flues without changing its temper.

Diameter of Flue	Each	Diameter of Flue	Each	Diameter of Flue	Each
1¼ in.	\$2.00	2½ in.	\$2.50	4 in.	\$4.00
1½ in.	2.00	2¾ in.	2.75	4½ in.	5.00
1¾ in.	2.00	3 in.	3.00	5 in.	6.00
2 in.	2.00	3¼ in.	3.25	6 in.	7.00
2¼ in.	2.25	3½ in.	3.50		

ENGINEER'S FAVORITE ADJUSTABLE FLUE SCRAPER



FIG. 1109

Sizes are for outside diameter of tube from 1¼ up to 6 inches.

Priceper diameter inch, \$1.00

DUPLEX FLUE SCRAPER



FIG. 1110

Adjustable in the Tube.

1¼-inch....\$2.00	2¼-inch....\$2.25	3 -inch....\$3.00	3¾-inch....\$3.75
1½-inch.... 2.00	2½-inch.... 2.50	3¼-inch.... 3.25	4 -inch.... 4.00
2 -inch.... 2.00	2¾-inch.... 2.75	3½-inch.... 3.50	4½-inch.... 5.00
	5-inch.... 6.25	6-inch.... 7.50	

Scrapers are made to fit boiler tubes having outside diameter of sizes given.

BOILER ROOM FIRING TOOLS

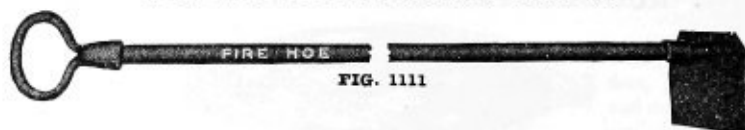


FIG. 1111

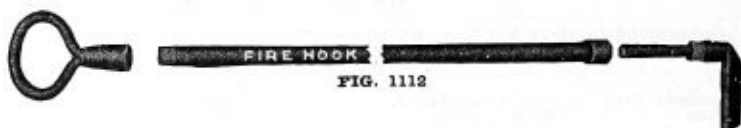


FIG. 1112

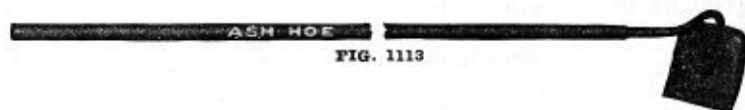


FIG. 1113



FIG. 1114

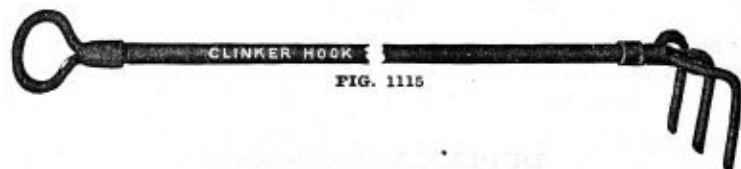


FIG. 1115

The above Tools are made of forged steel with pipe handle. It is impossible to break the handle in the thread, because the tool itself extends and fits into the pipe.

Light Style, with $\frac{3}{4}$ inch Pipe Handle

Fire Hoe, $6\frac{1}{2}$ "x8"x8'	each	\$3.45
Fire Hook, $5\frac{1}{2}$ "x8'	each	3.45
Slice Bar, $14\frac{1}{2}$ "x3"x8'	each	3.45
Clinker Hook, $7\frac{1}{2}$ "x6"x8'	each	3.80
Grips only	each	.75
Ash Hoe with wood handle	each	1.00

Heavy Style, with 1 inch Pipe Handle

7"x10"x8'	each	\$3.80
6"x8'	each	3.80
$15\frac{1}{2}$ "x3 $\frac{1}{2}$ "x8'	each	3.80
$8\frac{1}{2}$ "x7"x8'	each	4.45
.....	each	.95
With iron handle	each	2.00

COMMON GRATE BARS

LIGHT PATTERN



FIG. 1116

Length... in.	24	26	27	28	30	33	34	35	36	38	42	48	54	60
Width... in.	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	3	$2\frac{3}{4}$	3	3	3	3
Weight... lbs.	16	17	17	23	24	34	34	35	36	38	40	48	52	68
Air Space... in.	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$

HEAVY PATTERN



FIG. 1117

Length..... inches	42	48	50	54	60	66	72
Width..... inches	3	3	3	3	3	$3\frac{1}{2}$	$3\frac{1}{2}$
Weight..... lbs.	50	61	62	68	83	104	114
Air Space..... inches	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{3}{4}$

IMPROVED GRATE BAR—HERRINGBONE



FIG. 1118

Length..... inches	33	36	42	48	54	60	66	72
Width..... inches	6	6	6	6	6	6	6	6
Metal..... "	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Air Space..... "	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Weight..... lbs.	65	73	86	100	115	130	142	160

OBTUSE GRATE BAR

Metal..... $\frac{3}{8}$ inches
Air Space... $\frac{3}{8}$ "



FIG. 1119

Length..... inches	30	36	36	42	48	54	60	66
Width..... inches	5	5	6	6	6	6	6	6
Weight..... lbs.	50	60	60	75	90	105	120	135

SAWDUST OR SHAVING GRATE BAR

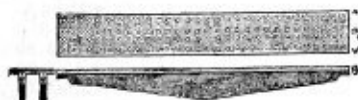


FIG. 1120

Length, Inches	Width, Inches	Weight, Lbs.
30	6	32
36	6	45
42	6	59
48	6	72
54	6	83
60	6	94

WILLIAMS BRASS COMPRESSION GREASE CUPS WITH AND WITHOUT SPRING LOCK

DAISY
With Spring Lock
and Leather
Washer

CAST BRASS

DRAGON
With Leather
Washer and with-
out Spring Lock



FIG. 1121



FIG. 1122

Number	00	0	1	2	3	4
Shank Pipe Thread.....inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$1\frac{1}{2}$	$2\frac{1}{2}$
Capacity .....ounces	$\frac{1}{4}$	$\frac{1}{2}$	1	2	3	5
Extreme height, Daisy Cup.....inches	$1\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{2}$
Extreme outside diameter, Daisy and Dragon Cups.....inches	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$2\frac{1}{4}$	$2\frac{3}{4}$	$3\frac{1}{4}$
Extreme height, Dragon Cup.....inches	$1\frac{1}{8}$	$1\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{3}{4}$	$3\frac{1}{4}$	$3\frac{1}{2}$
Daisy, Cup, finished brass .....each	\$0.70	.90	1.15	1.50	2.15	2.90
Daisy Cup, nickel plated .....each	.82	1.06	1.36	1.80	2.60	3.40
Dragon Cup, finished brass .....each	.70	.90	1.15	1.50	2.15	2.90
Dragon Cup, nickel plated .....each	.82	1.06	1.36	1.80	2.60	3.40
Dragon Cup, rough brass .....each	.56	.74	.96	1.28	1.76	2.30

WILLIAMS PLAIN COMPRESSION GREASE CUPS CAST BRASS

DIAMOND
Polished Brass

DIAMOND
Rough Brass



FIG. 1123



FIG. 1124

Number	00	0	1	2	3	4
Shank Pipe Thread.....inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$1\frac{1}{2}$	$2\frac{1}{2}$
Capacity .....ounces	$\frac{1}{4}$	$\frac{1}{2}$	1	2	3	5
Extreme height, Diamond Cup .....inches	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$2\frac{1}{4}$	$2\frac{3}{4}$	$3\frac{1}{4}$
Extreme outside diameter, Diamond Cup.....inches	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$2\frac{1}{4}$	$2\frac{3}{4}$	$3\frac{1}{4}$
Diamond Cup, finished brass .....each	\$0.70	.90	1.15	1.50	2.15	2.90
Diamond Cup, nickel plated .....each	.80	1.00	1.30	1.70	2.45	3.20
Diamond Cup, rough brass .....each	.56	.74	.96	1.28	1.76	2.30

NOTE—Cups ordered with shanks smaller than our regular standard are liable to breakage and are not guaranteed. An extra charge will be made on all cups having pipe threaded shanks smaller or larger than listed.

WILLIAMS BRASS AUTOMATIC GREASE CUPS

DANDY

Sectional View of Dandy,

DUCHESS



FIG. 1125



FIG. 1126



FIG. 1127

Number	00	0	1	2	3	4
Shank Pipe Thread.....inch	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
Capacity.....ounces	$\frac{1}{8}$	1	1 $\frac{1}{2}$	3	6	10
Extreme height of Dandy and Duchess, plunger raised.....inches	3 $\frac{3}{4}$	4 $\frac{1}{2}$	5 $\frac{1}{2}$	6 $\frac{5}{8}$	8 $\frac{1}{8}$	9 $\frac{1}{2}$
Extreme outside diameter of Dandy and Duchess.....inches	1	1 $\frac{3}{4}$	2	2 $\frac{1}{2}$	3 $\frac{3}{8}$	3 $\frac{1}{2}$
Dandy or Duchess, finished brass.....each	\$1.50	2.00	2.50	3.20	4.30	6.00
Dandy or Duchess, nickel plated.....each	1.75	2.25	2.80	3.60	5.00	6.75

WILLIAMS BRASS SCREW FEED GREASE CUPS

DUKE

Sectional View of the Duke

DAKOTA



FIG. 1128



FIG. 1129



FIG. 1130

Number	00	0	1	2	3	4
Shank Pipe Thread.....inch	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
Capacity.....ounces	$\frac{1}{8}$	1	1 $\frac{1}{2}$	3	6	10
Extreme height of Duke, plunger raised (cup open).....inches	3 $\frac{3}{4}$	4 $\frac{1}{2}$	5 $\frac{1}{2}$	6 $\frac{5}{8}$	8 $\frac{1}{8}$	9 $\frac{1}{2}$
Extreme height of Dakota, plunger raised (cup open).....inches	3 $\frac{3}{4}$	4	4 $\frac{3}{4}$	6 $\frac{1}{8}$	7 $\frac{5}{8}$	8 $\frac{3}{4}$
Extreme outside diameter of Duke and Dakota.....inches	1 $\frac{7}{8}$	1 $\frac{3}{4}$	2	2 $\frac{1}{2}$	3 $\frac{1}{8}$	3 $\frac{1}{2}$
Duke or Dakota, finished brass.....each	1.00	1.20	1.60	2.00	2.80	4.00
Duke or Dakota, nickel plated.....each	1.20	1.45	1.90	2.40	3.40	4.75

WILLIAMS PLAIN COMPRESSION GREASE CUPS

WITH AND WITHOUT SPRING LOCK

STAMPED STEEL

DERBY Without Spring Lock



FIG. 1131

DWARF With Spring Lock



FIG. 1132

Number	000	00	0	1	2	3	4
Shank Pipe Thread	1/8	1/8	1/4	1/4	3/8	1/2	1/2
Capacity	1/4	1/2	3/8	1	2	3 1/2	5
Inside diameter	3/4	1 1/8	1 3/8	1 7/8	2 1/8	2 5/8	3 1/8
Outside diameter	1 1/4	1 3/4	1 7/8	2 1/4	2 7/8	3 1/4	3 7/8
Height over all	1 3/4	1 7/8	2 1/4	2 5/8	3	3 3/4	4 1/8
Derby, plain steel, without lock	each \$0.28	.30	.40	.53	.70	.95	1.30
Dwarf, plain steel, with lock	each	.50	.60	.80	1.05	1.30	1.60 2.00

WILLIAMS SCREW FEED AND SPRING COMPRESSION

GREASE CUPS

STAMPED STEEL

DIPLOMA



FIG. 1133

DAHLIA



FIG. 1134

Number	00	0	1	2	3	4
Shank Pipe Thread	1/8	1/4	1/4	3/8	1/2	1/2
Capacity	1/8	1	1 1/2	3	6	10
Extreme height of Diploma and Dahlia Cups (plunger raised)	3 1/2	4 1/2	5 1/4	6 3/8	7 1/4	8 5/8
Extreme outside diameter of Diploma and Dahlia Cups	1 1/4	1 3/8	1 7/8	2 1/8	2 5/8	3 1/8
Diploma, rough steel	each \$1.30	1.50	1.75	2.00	2.75	4.00
Diploma, nickel plated	each	1.65	1.90	2.25	2.65	3.50 4.75
Dahlia, rough steel	each	.80	.95	1.15	1.35	1.75 3.00
Dahlia, nickel plated	each	1.15	1.35	1.65	2.00	2.50 3.75

NOTE—These cups cannot be furnished with shank pipe threads different than the standard sizes listed above, unless ordered in large quantities.

"GACO" STEEL GREASE CUPS

Number	00	0	1	2	3	4
Inside Diam.....in.	1	1¼	1½	2	2½	3
Shank Pipe						
Thread	1½	1½ or 1¼	1¼	1¼ or 3⁄8	3⁄8 or 1⁄2	1½
Capacity	1½	2½	1	2	3½	5
Plain Steel	\$0.70	.90	1.15	1.50	2.15	2.90
Blued Steel.....ea.	.90	1.15	1.40	1.80	2.60	3.50



FIG. 1135



FIG. 1136

POWELL "BRUNO" ALL IRON COMPRESSION GREASE CUPS

Numbers	00	0	1	2	3
Inside Diam. of Body.....in.	1	1¼	1½	2	2½
Capacity	1½ oz.	1 oz.	1½ oz.	3 oz.	4½ oz.
Size of Shank, Pipe Thrd.in.	1¼	1¼	3⁄8	3⁄8	1½
Painted	per doz.	\$10.00	11.25	12.00	12.50
					25.00

Can furnish the No. 2 with 1½-inch male shank, if desired.

"MOON" AUTOMATIC GREASE CUP

The excellent features of this cup cannot fail to recommend it at once. It has a beveled leather washer which insures a tight joint and smooth working. The washer can be expanded by the adjusting screw on bottom of plunger. The spring and plunger are controlled by the thumb nut on top of cup, which will not jar from position. The rate of feed is regulated by screw "C."

Number	0	1	2	3	4	5
Inside diam.....inches	¾	1½	1½	1¾	2¼	3
Outside diam.....inches	1¼	1½	1¾	2	2¾	3¾
Height over all, plunger raised	inches	3¼	4½	4¾	5¾	6½
Capacity	ounces	1½	1	1½	2½	4½
Shank Pipe Thread.....inches	1½	1¼	1¼	1¼	3⁄8	1½
Finished Brass	each	\$1.50	2.00	2.50	3.20	4.30
Finished Nickel	each	1.75	2.25	2.80	3.60	5.00
						6.75

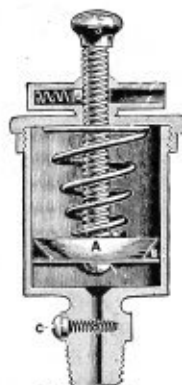


FIG. 1137

PENBERTHY GREASE CUPS



FIG. 1138



FIG. 1139



FIG. 1140

Particularly adapted for rough work. They are thoroughly well made from castings, strong, durable and self-locking, and will outlast many times the spun brass article.

Number	00	0	1	2	3	4
Capacity ounces	$\frac{1}{2}$	$\frac{3}{8}$	1	2	$3\frac{1}{2}$	5
Outside Diameter inches	$1\frac{1}{8}$	$1\frac{3}{8}$	$1\frac{1}{2}$	2	$2\frac{3}{4}$	$3\frac{1}{4}$
Size, Thread inches	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$
Price, Unfinished Brass.....each	\$0.55	\$0.75	\$0.95	\$1.25	\$1.70	\$2.30
Price, Finished Brass.....each	.70	.90	1.15	1.50	2.15	2.90
Price, Nickel-plated.....each	.80	1.05	1.35	1.80	2.60	3.40

"SAMSON"

A substantial cast brass cup made to stand hard usage; made of best steam metal, highly polished.

Number	00	0	1	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4
Capacity ounces	$\frac{1}{2}$	1	$1\frac{1}{2}$	$2\frac{1}{4}$	$3\frac{1}{4}$	$4\frac{3}{4}$	6	10
Extreme Outside Diam. ins.	$1\frac{1}{8}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$2\frac{1}{8}$	$2\frac{1}{2}$	$2\frac{3}{4}$	$3\frac{1}{8}$	$3\frac{5}{8}$
Height Over All, Plunger								
Raised ins.	4	$4\frac{1}{4}$	$5\frac{1}{2}$	6	6 $\frac{3}{4}$	7	$7\frac{1}{2}$	$8\frac{3}{4}$
Size, Thread ins.	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Price, Finished Brass.....each	\$1.00	\$1.20	\$1.60	\$1.80	\$2.00	\$2.40	\$2.80	\$4.00
Price, Nickel-plated.....each	1.20	1.45	1.90	2.10	2.40	2.90	3.40	4.75

"SILEX"

Used extensively on slides, journals, eccentrics and crank pins. The amount of feed is regulated by the feed screw in hexagon. The cup requires no further attention, except refilling.

Number	00	0	1	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4
Capacity ounces	$\frac{1}{2}$	1	$1\frac{1}{2}$	$2\frac{1}{4}$	$3\frac{1}{4}$	$4\frac{3}{4}$	6	10
Extreme Outside Diam. ins.	$1\frac{1}{8}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$2\frac{1}{8}$	$2\frac{1}{2}$	$2\frac{3}{4}$	$3\frac{1}{8}$	$3\frac{5}{8}$
Height Over All, Plunger								
Raised ins.	4	$4\frac{1}{4}$	5 $\frac{1}{2}$	6 $\frac{1}{4}$	6 $\frac{3}{4}$	7	$7\frac{1}{2}$	$8\frac{3}{4}$
Size, Thread ins.	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Price, Finished Brass.....each	\$1.50	\$2.00	\$2.50	\$2.85	\$3.20	\$3.75	\$4.30	\$6.00
Price, Nickel-plated.....each	1.75	2.25	2.80	3.20	3.60	4.40	5.00	6.75

BRASS OIL CUPS

Plain



FIG. 1141

Locomotive



FIG. 1142

Small Base



FIG. 1143

Hinged Lid

Large Base



FIG. 1144

Diameter inches	%	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{7}{8}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$
Size Thread inches	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Price, Plain each	\$0.25	.30	.35	.40	.60	.90	1.25	1.60	1.75	2.35	2.75
Price, Locomotive each	.70	.85	1.05	1.25	1.50	1.90	2.40	2.80	3.30	4.30	5.00
Price, Hinged Lid each	.....	.....	.70	.85	1.20	1.60	2.10	2.50	2.70		

Elbow Shank



FIG. 1145

Tee Handle



FIG. 1146

Lever Handle



FIG. 1147

Diameter .....inches	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	1 $\frac{7}{8}$	2	2 $\frac{1}{4}$	2 $\frac{1}{2}$
Size Thread.....inches	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{2}$
Price, Elbow Shank...ea.	\$0.55	.65	.75	.85	1.00	1.40	1.80	2.15	2.40	3.00	3.80
Price, Tee Handle....ea.	.75	.80	.90	1.00	1.50	2.00	2.50	2.75	3.00	3.75	4.50
Price, Lever Handle...ea.	.85	.90	1.00	1.10	1.60	2.20	2.75	3.00	3.25	4.00	5.00

SELF-CLOSING DUST PROOF OIL CUPS, NICKEL-PLATED

Style E



FIG. 1148

Style D



FIG. 1149

FIG. 11c										FIG. 11d									
STYLE B								List	STYLE D										
Optional				Diam.		Diam.		per 100	Optional				Diam.	List					
No.	Stock	Thread	Pipe	of	of	Hex.	Cap		No.	Stock	Thread	Pipe			Diam.				
	Diam.	Pitch	Thread				Nickel			Diam.	Pitch	Thread	of Cap	per 100					
1	1/4	32	.....	3/8	1 1/2	1 1/2	\$	4.00	0	10	32	.....	1 1/2	\$ 7.00					
2	3/8	32	.....	1/2	1 1/2	1 1/2		9.50	1	10	32	.....	1 1/2	7.00					
3	1/2	24	.....	1 1/2	1 1/2	1 1/2		10.70	2	10	32	.....	1 1/2	9.50					
4	3/4	24	.....	1 1/2	1 1/2	1 1/2		12.50	3	10	32	.....	1 1/2	10.70					
5	1	24	.....	1 1/2	1 1/2	1 1/2		16.00	4	10	32	.....	1 1/2	12.50					
6	1 1/4	24	.....	1 1/2	1 1/2	1 1/2		22.00	5	10	32	.....	1 1/2	16.00					
7	1 1/2	24	.....	1 1/2	1 1/2	1 1/2		30.00	6	10	32	.....	1 1/2						
8	1 3/4	Pipe	.....	1 1/2	1 1/2	1 1/2		38.00	7	10	32	.....	1 1/2						

TERRIER With Sight Feed



FIG. 1150

WILLIAMS LOCK BAR GLASS OIL CUPS

CAST BRASS

TROPHY
Without Sight Feed

FIG. 1151

Number	0	1	1½	2	3	4	5	6
Shank Pipe Thread	inch 1/8	1/4	1/4	3/8	3/8	3/8	1/2	1/2
Capacity	ounces 5/8	1	1½	2½	4	5	10	18
Extreme Height of Terrier Cup.....	inches 4	4¼	4¾	5¼	5½	5¾	7	8
Extreme Height of Trophy Cup.....	inches 3½	3¾	4¼	4½	4¾	5¼	6¼	7¼
Extreme Outside Diameter of Terrier and Trophy Cups	inches 1½	2	2	2½	2½	3¼	3¾	4¾
Terrier Cup, finished brass.....	each \$1.25	1.50	1.75	2.10	2.55	3.15	3.90	4.80
Terrier Cup, nickel plated.....	each 1.40	1.75	2.10	2.35	2.85	3.50	4.30	5.30
Trophy Cup, finished brass.....	each 1.00	1.20	1.40	1.65	2.00	2.60	3.25	4.00
Trophy Cup, nickel plated.....	each 1.15	1.45	1.75	2.00	2.35	2.95	3.65	4.50

TARRANT With Sight Feed



FIG. 1152

WILLIAMS SLIDE LEVER GLASS OIL CUPS

CAST BRASS

TAMARACK
Without Sight Feed

FIG. 1153

Number	000	00	0	1	1½	2	3	4	5	6
Shank Pipe Thread.....	inch 1/8	1/8	1/8	1/4	1/4	3/8	3/8	3/8	1/2	1/2
Capacity	ounces 1/2	1/2	5/8	1	1½	2½	4	5	10	18
Extreme height of Tarrant Cup	inches 3½	4½	4¾	4¾	5½	5¾	5¾	6¾	7¾	
Extreme height of Tamarack Cup	inches 3½	3¾	3¾	3¾	4½	4¾	4¾	5½	6½	7½
Extreme outside diameter of Tarrant and Tamarack Cups.....	inches 1½	1½	1½	2	2	2½	2½	3¼	3¾	4¾
Tarrant Cup, finished brass....	ea. \$1.00	1.05	1.30	1.55	1.85	2.30	2.85	3.60	4.50	
Tarrant Cup, nickel plated....	ea. 1.10	1.25	1.50	1.80	2.15	2.60	3.20	4.00	5.00	
Tamarack Cup, finished brass....	ea. \$0.70	.75	.80	1.00	1.25	1.50	1.90	2.40	3.10	4.00
Tamarack Cup, nickel plated....	ea. .80	.85	.95	1.20	1.50	1.75	2.20	2.75	3.50	4.50

TACOMA
With Sight Feed

FIG. 1154

WILLIAMS SNAP LEVER
GLASS OIL CUPS

CAST BRASS

NOTE.—Cups ordered with shanks smaller than our regular standard are liable to breakage and are not guaranteed. An extra charge will be made on all cups having pipe threaded shanks smaller or larger than listed below.

TREMONT
Without Sight Feed

FIG. 1155

Number	0	1	1½	2	3	4	5	6
Shank Pipe Thread.....in.	¾	¾	¾	¾	¾	¾	¾	¾
Capacity	5	1	1½	2½	4	5	10	18
Extreme height of Tacoma Cup, lever up	5 1/16	5 1/8	5 1/4	6 1/8	6 3/8	6 7/8	8 1/8	9 1/8
Extreme height of Tremont Cup, lever up	4 5/8	5 1/8	5 1/4	5 3/4	6	6 3/8	7 3/8	8 3/8
Extreme outside diameter of Tacoma and Tremont Cups	1 3/8	2	2	2 1/2	2 1/2	3 1/4	3 3/8	4 3/8
Tacoma Cup, finished brass.....ea.	\$3.00	3.25	3.50	3.75	4.25	5.25	7.25	9.25
Tacoma Cup, nickel plated.....ea.	3.50	3.75	4.00	4.25	4.75	5.75	8.00	10.25
Tremont Cup, finished brass	1.90	2.10	2.30	2.50	2.80	3.60	5.00	6.40
Tremont Cup, nickel plated.....ea.	2.30	2.50	2.65	2.80	3.20	4.00	5.60	6.95



FIG. 1156

"EMERGENCY" SNAP LEVER SIGHT-
FEED GLASS OIL CUP

Number	0	1	1½	2	3	4	5	6	7
Outside diam. Glass	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	3	3 1/2	4 1/4
Height of Glass.....in.	1 1/8	1 3/8	1 5/8	1 7/8	2 1/8	2 3/8	3	4	5
Capacity	5	1	1½	2½	4	5	10	18	Qt.
Shank Pipe Thread	¾	¾	¾	¾	¾	¾	¾	¾	¾
Finished Brass.....ea.	\$3.00	3.25	3.50	3.75	4.25	5.25	7.25	9.25	13.00
Nickel Plated.....ea.	3.50	3.75	4.00	4.25	4.75	5.75	8.00	10.25	14.00
Glasses.....ea.	.08	.10	.10	.12	.15	.25	.35	.65	1.50
Cork Washers....doz.	.24	.30	.36	.40	.45	.50	.60	.75	1.50

WILLIAMS INDEX GLASS OIL CUPS

TOPAZ With Sight Feed

CAST BRASS

TEMPLE
Without Sight Feed

FIG. 1157



FIG. 1158

Number	0	1	1½	2	3	4	5	6
Shank Pipe Thread	1/8	1/4	1/2	3/8	3/4	1	1½	2
Capacity	5/8	1	1½	2½	4	5	10	18
Extreme height of Topaz Cup	4 5/8	4 3/4	4 5/8	5 1/2	5 3/4	6	7 3/4	8 1/2
Extreme height of Temple Cup	3 3/8	4 3/8	4 1/2	4 5/8	5 1/2	5 3/4	6 3/8	7 1/2
Extreme outside diameter of Topaz and Temple Cups	2 3/8	2 3/8	2 3/8	2 3/8	2 3/8	2 3/8	3 3/8	3 3/8
Topaz Cup, finished brass	\$1.25	1.50	1.75	2.10	2.55	3.15	3.90	4.80
Topaz Cup, nickel plated	1.40	1.70	2.00	2.35	2.85	3.50	4.30	5.30
Temple Cup, finished brass	1.00	1.20	1.45	1.75	2.15	2.70	3.40	4.30
Temple Cup, nickel plated	1.15	1.40	1.70	2.00	2.45	3.05	3.80	4.80

WILLIAMS AUTOMATIC ROD OIL CUPS

Check Valve Feed

CAST BRASS

Screw Feed

For Engine Crank Pins



FIG. 1159



FIG. 1160

Number	0	1	1½	2	3	4
Shank Pipe Thread	1/8	1/4	1/2	3/8	3/4	1
Capacity	5/8	1	1½	2½	4	5
Extreme height, cap raised open to fill	3 1/8	3 3/8	3 3/8	4 3/8	4 3/8	4 3/8
Extreme outside diameter	1 1/4	1 3/8	2	2 1/4	2 1/4	2 3/8
Either style, finished brass	\$1.10	1.50	2.00	2.50	3.00	4.00
Either style, nickel plated	1.25	1.70	2.25	2.75	3.30	4.35

PLAIN TAPER SCREW SIGHT-FEED ENGINE OILERS

SERIES 160—TAPER SCREW, FILLING HOLE AND BALL SHANK SIGHT-FEED



FIG. 1161

Number	Height of Cup, Complete, Inches	Width of Cup, Complete, Inches	Capacity, in Ounces	Size of Shank Pipe Thread, Inches	List Price per Dozen
161.....	3 $\frac{1}{4}$	1 $\frac{1}{8}$	$\frac{1}{2}$	$\frac{1}{8}$	\$10.00
162.....	3 $\frac{3}{8}$	1 $\frac{1}{8}$	$\frac{3}{8}$	$\frac{1}{8}$	11.00
163.....	3 $\frac{1}{2}$	1 $\frac{1}{8}$	$\frac{1}{2}$	$\frac{1}{8}$	12.00
164.....	4 $\frac{1}{4}$	1 $\frac{1}{8}$	1	$\frac{1}{4}$	13.00
165.....	4 $\frac{3}{8}$	1 $\frac{1}{8}$	1 $\frac{1}{2}$	$\frac{1}{4}$	15.00
166.....	5 $\frac{1}{8}$	2 $\frac{1}{4}$	2	$\frac{3}{8}$	17.00
167.....	5 $\frac{3}{8}$	2 $\frac{1}{4}$	4	$\frac{3}{8}$	20.00
168.....	6 $\frac{1}{4}$	2 $\frac{3}{8}$	6	$\frac{3}{8}$	24.00
169.....	7 $\frac{1}{4}$	3 $\frac{3}{8}$	10	$\frac{1}{2}$	32.00
170.....	7 $\frac{3}{4}$	3 $\frac{3}{4}$	15	$\frac{1}{2}$	44.00
171.....	8 $\frac{1}{2}$	4 $\frac{1}{4}$	24	$\frac{3}{4}$	60.00
172.....	9 $\frac{1}{4}$	4 $\frac{3}{8}$	36	$\frac{3}{4}$	96.00



FIG. 1162

"SIGNAL" STOP AND SCREW SETTING SIGHT-FEED OILER FOR GAS, GAS-OIL AND OIL ENGINES

No.	Height of Cup, Complete, in Inches, "Signal Up"	Diameter of Cup, Complete, in Inches	Capacity in Ounces	Size of Shank Pipe Thread, in Inches	List Price per Dozen	No.	Height of Cup, Complete, in Inches, "Signal Up"	Diameter of Cup, Complete, in Inches	Capacity in Ounces	Size of Pipe Shank Thread, in Inches	List Price per Dozen
745.....	5 $\frac{1}{8}$	2 $\frac{1}{2}$	1 $\frac{1}{2}$	$\frac{1}{4}$	\$27.00	749.....	7 $\frac{1}{8}$	3 $\frac{1}{8}$	10	$\frac{3}{4}$	\$54.00
746.....	6 $\frac{1}{8}$	2 $\frac{3}{8}$	2	$\frac{3}{8}$	30.00	750.....	8 $\frac{1}{4}$	3 $\frac{3}{4}$	15	$\frac{3}{4}$	72.00
747.....	6 $\frac{3}{8}$	2 $\frac{3}{8}$	4	$\frac{3}{8}$	36.00	751.....	9 $\frac{1}{8}$	4 $\frac{1}{8}$	24	$\frac{3}{4}$	108.00
748.....	7 $\frac{1}{8}$	2 $\frac{3}{8}$	6	$\frac{3}{8}$	42.00	752.....	10 $\frac{1}{8}$	4 $\frac{1}{8}$	36	$\frac{3}{4}$	168.00



FIG. 1163

"NEW SIGNAL" STOP AND SIGHT-FEED OILER

SERIES 840—SKELETON FRAME

Number	Height of Cup, Complete, Inches Signal Up	Diameter of Cup, Complete, Inches	Capacity, in Ounces	Size of Shank Pipe Thread, Inches	List Price per Dozen
843.....	5	1 $\frac{1}{8}$	$\frac{3}{2}$	$\frac{1}{8}$	\$16.00
844.....	5 $\frac{1}{2}$	1 $\frac{1}{8}$	1	$\frac{1}{8}$	18.00
845.....	6 $\frac{1}{4}$	2	1 $\frac{1}{2}$	$\frac{1}{4}$	21.00
846.....	6 $\frac{3}{4}$	2 $\frac{1}{8}$	2	$\frac{1}{4}$	24.00
847.....	6 $\frac{3}{4}$	2 $\frac{3}{8}$	4	$\frac{3}{8}$	27.00
848.....	7 $\frac{1}{2}$	2 $\frac{1}{2}$	6	$\frac{3}{8}$	32.00
849.....	8 $\frac{1}{2}$	3 $\frac{1}{4}$	10	$\frac{1}{2}$	40.00
850.....	8 $\frac{3}{4}$	3 $\frac{1}{2}$	15	$\frac{1}{2}$	54.00
851.....	10 $\frac{3}{8}$	4 $\frac{1}{8}$	24	$\frac{3}{4}$	84.00
852.....	11 $\frac{1}{8}$	4 $\frac{1}{2}$	36	$\frac{3}{4}$	120.00



FIG. 1164

CYLINDRICAL GLASSES AND CORK WASHERS

When ordering glasses or cork washers, merely specify the number of cup as stamped on same.

Number	000	00	0	1	1½	2	3	4	5	6	8
Outside Diameter of Cylindrical Glasses .....inches	1	1½	1¾	1½	1¾	2	2¼	2½	3	3½	4¼
Height of Cylindrical Glasses .....inches	7/8	1	1½	1¾	1½	1¾	2¾	2¾	3	4	5
Price .....each	.05	.06	.08	.10	.10	.12	.15	.25	.35	.65	1.50
Cork Washers .....dozen	.15	.18	.24	.30	.36	.40	.45	.50	.60	.75	1.50

WILLIAMS "WALRUS" GLASS BODY OIL PUMP

Patented

In addition to the sight feed lubricator ordinarily used, every engine should be equipped with a Williams Oil Pump, either on the throttle or directly on the steam chest, for use in cases of emergency, should the lubricator get out of order.

The Williams Glass Body Oil Pump has several new and exclusive features, among which is the dust-proof cover, fitting snugly over the lever onto the filling hole.

The pump mechanism is located inside of the collar at bottom of reservoir, and being completely submerged in oil, it can be depended upon to operate easily at all times.

There is also a strainer at the bottom of reservoir, over the oil supply holes, which prevents any grit or foreign oil from finding its way to the cylinder.

Compactly built, nicely polished, no engine is complete without one. Furnished in brass or nickel plated as listed below.

WALRUS

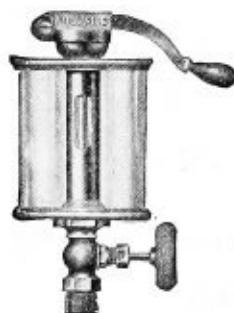


FIG. 1165

Size	Number	3	5	6	8
Shank Pipe Thread.....inch		¾	¾	¾	¾
Capacity		¼ Pint	½ Pint	1 Pint	1 Quart
Outside Diameter of Glass.....inches		2¼	3	3½	4¼
Height of Glass.....inches		2¼	3	4	5
Finished Brass .....each		7.50	8.50	10.00	15.00
Nickel Plated .....each		8.25	9.50	11.00	16.50
Extra Glasses .....each		.15	.35	.65	1.50
Extra Cork Washers.....per dozen		.45	.60	.75	1.50

MICHIGAN GLASS BODY OIL PUMP

These pumps are used by nearly all the large Engine Builders as an auxiliary to the Sight Feed Lubricator on Stationary and Marine Engines. They are of first class design, finish and workmanship and will feed oil against extreme high pressure. All are carefully tested before shipment and guaranteed first class in every particular.

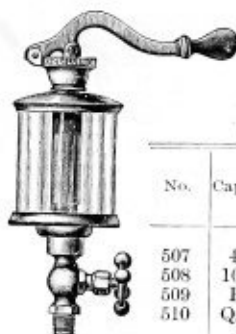


FIG. 1166

No.	Capacity	Diameter of Glass Shell, Inches	Height of Glass Shell, Inches	Size of Shank, Inches	Price Each, Brass Finish	Price Each, Nickel Plated
507	4 oz.	$2\frac{3}{8}$	$2\frac{3}{4}$	$\frac{3}{8}$	\$ 7 50	\$ 8 50
508	10 oz.	$3\frac{1}{8}$	$3\frac{5}{8}$	$\frac{1}{2}$	10 00	11 25
509	Pint	$3\frac{1}{2}$	4	$\frac{1}{2}$	12 00	13 50
510	Quart	$4\frac{1}{8}$	$5\frac{1}{8}$	$\frac{3}{4}$	16 00	18 00

MICHIGAN HAND CYLINDER OIL PUMPS
WITH VALVE

The Michigan Oil Pumps have been on the market for over twenty years and are used as an auxiliary to the Sight Feed Lubricators on Stationary and Marine Engines. The use of an oil Pump with Valve does away with the necessity of a Globe Valve. We supply Gauze Strainers at a nominal price, which insures clean oil.

For Horizontal Connection



FIG. 1167

For Vertical Connection



FIG. 1168

No. Horizontal Connection	No. Vertical Connection	Capacity	Threaded Iron Pipe	Brass	Nickel
500	503	$\frac{1}{4}$ Pint	$\frac{3}{8}$	\$3 50	\$4 00
501	504	$\frac{1}{2}$ Pint	$\frac{3}{8}$	5 00	5 65
502	505	1 Pint	$\frac{3}{8}$	7 50	8 40

Net extra for strainer in top 15 cents.

"WHITE STAR" OIL FIXTURE FITTINGS OR OIL CUP BASES

No. 1—Corner Connection Right Hand

**FIG. 1169**

No. 2—Corner Connection Left Hand

**FIG. 1170**

No. 3—Straight Connection

**FIG. 1171**

No. 4—Cross Connection

**FIG. 1172**

No. 5—Three-Way Connection

**FIG. 1173**

No. 6—Angle Connection Right Hand

**FIG. 1174**

No. 7—Angle Connection Left Hand

**FIG. 1175**

Where it is desired to install a combination gravity and pressure oiling system, the bases shown will be found especially adapted for this purpose.

They are so designed that any style or make of oil cup can be attached to the top of these bases, thus eliminating the expense of purchasing new oil cups.

The construction of the bases is such that oil under pressure is piped through the union connection, thence through the sight-feed to bearing; the rate of feed being adjusted by the Tee Handle valve.

If for any reason this system is discontinued, the gravity or auxiliary system is quickly brought into use by closing the regulating valve in the base and opening valve in oil cup. It is advisable to keep the oil cups well filled at all times, and also have the oil cup valve closed when pressure system is in use.

These bases are made in many styles and sizes, and being of compact and heavy construction, their use will prove them satisfactory articles in every respect.

All connections on fittings are of the same pipe thread.

Always order by size and figure number.

Finish	Finished Brass			Nickel Plated		
	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
Size.....inches						
Straight Connection No. 3, each	\$2.00	2.50	3.00	2.30	2.90	3.50
Angle Connection, Right Hand						
No. 6, Left Hand No. 7,.....each	\$2.10	2.75	3.40	2.40	3.30	3.90
Corner Connection, Right Hand						
No. 1, Left Hand No. 2,.....each	\$3.00	3.10	3.60	3.50	3.60	4.10
Cross Connection No. 4,.....each	\$3.00	3.10	3.60	3.50	3.60	4.10
Three-Way Connection,						
No. 5,.....each	\$3.50	3.60	4.10	4.00	4.10	4.70

No. 1—Cross Drip Valve

FIG. 1176
No. 5—Cross Sight-feed ValveFIG. 1180
No. 9—Cross Sight-feed Valve with Union

FIG. 1184

"SNAP LEVER" DRIP AND SIGHT-FEED VALVES

No. 2—Straight Drip Valve



FIG. 1177

No. 6—Straight Sight-feed Valve



FIG. 1181

No. 10—Straight Sight-feed Valve with Union

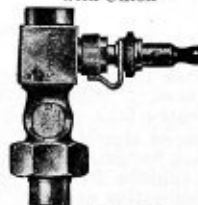


FIG. 1185

No. 3—Angle Drip Valve

FIG. 1178
No. 7—Angle Sight-feed ValveFIG. 1182
No. 11—Angle Sight-feed Valve with Union

FIG. 1186

No. 4—Corner Drip Valve

FIG. 1179
No. 8—Corner Sight-feed ValveFIG. 1183
No. 12—Corner Sight-feed Valve with Union

FIG. 1187

Size.....inches		Finished Brass		Nickel Plated	
		$\frac{1}{2}$, $\frac{3}{4}$ or $\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$, $\frac{3}{4}$ or $\frac{1}{2}$	$\frac{1}{2}$
No. 1—Cross Drip Valve	list each	\$1 50	1 40	1 75	1 85
" 2—Straight Drip Valve	" "	1 25	1 40	1 50	1 65
" 3—Angle Drip Valve	" "	1 25	1 40	1 50	1 65
" 4—Corner Drip Valve	" "	1 50	1 62	1 75	1 85
" 5—Cross Sight-feed Valve	" "	2 30	3 20	2 60	3 50
" 6—Straight Sight-feed Valve	" "	2 00	3 00	2 25	3 25
" 7—Angle Sight-feed Valve	" "	2 00	3 00	2 25	3 25
" 8—Corner Sight-feed Valve	" "	2 30	3 20	2 60	3 50
" 9—Cross Sight-feed Valve with Union...	" "	2 80	3 70	3 10	4 00
" 10—Straight Sight-feed Valve with Union ..	" "	2 50	3 50	2 80	3 80
" 11—Angle Sight-feed Valve with Union ..	" "	2 50	3 50	2 80	3 80
" 12—Corner Sight-feed Valve with Union ..	" "	2 80	3 70	3 10	4 00

WILLIAMS BRASS PRIMING CUPS FOR GASOLINE ENGINES

No. 520
Lever Handle

FIG. 1188

No. 183
Forked Handle

FIG. 1189

No. 521
Tee Handle

FIG. 1190

No. 182
Elb Shank, Left Hand

FIG. 1191

No. 183, with forked lever, is intended for engines having two or more cylinders, the levers of the cups being connected to a single rod, which operates all cups simultaneously. When open, the lever of this cup is 45° from the center line of body.

Nos. 520 and 182 show the cups closed, with the levers parallel with bowl or body. When open they are at right angles to the body.

No. 521 shows the cup open. When closed the tee handle is at right angles to the body.

NOTE—An extra charge will be made for cups ordered with shank pipe threads different from our standard listed below.

Size	Number	0	2	4
Size of Pipe Thread.....inch		$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
No. 520, Lever Handle	each	\$0.85	1.10	1.65
No. 521, Tee Handle.....	each	.80	1.00	1.50
No. 183, Forked Handle.....	each	1.15	1.50	2.00
No. 182, Elbow Shank, Left Hand	each	1.00	1.35	1.90
No. 480, Elbow Shank, Right Hand	each	1.00	1.35	1.90

WILLIAMS "WARRIOR" INDEPENDENT SIGHT FEEDS

No. 485
Plain

FIG. 1192

The "Warrior" Independent Sight Feed is intended for use wherever it is desired to lubricate the cylinders of several engines from a centrally located tank.

No. 485 is for use on simple engines, while No. 805 is generally used on compound engines, it having an equalizing connection at top to prevent the oil from siphoning.

The upper shank is threaded $\frac{3}{8}$ " male pipe thread, the oil connection $\frac{1}{4}$ " female pipe thread and the siphon connection $\frac{1}{4}$ " female pipe thread.

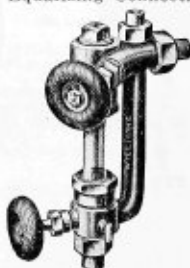
No. 805 With
Equalizing Connection

FIG. 1193

No. 485, Brass, plain	each	\$6.00
No. 485, Nickel Plated, plain.....	each	7.00
No. 805, Brass, with equalizing connection.....	each	6.50
No. 805, Nickel Plated, with equalizing connection.....	each	7.50

SWAIN LUBRICATOR CUPS

FOR SHAFTING

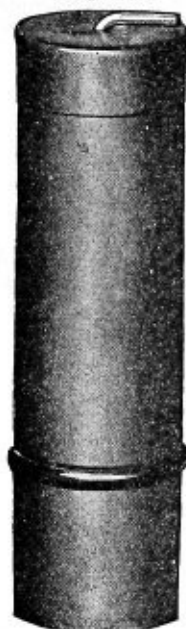


FIG. 1194

FOR SHAFTING

Size,	inch Outside Diameter	Price	each
" 1 1/2	"	" 20c	"
" 1 3/4	"	" 25c	"
" 2	"	" 30c	"
" 2 1/2	"	" 50c	"

From 1 1/2 to 2 inch shaft order 1 1/2 inch cup
 " 2 1/4 to 3 " " " 2 " "
 " 3 1/2 to 6 " " " 1 " "
 " 6 inch up order 1 1/2 inch cup.

FOR LOOSE PULLEYS

3/4 inch of finished brass	80	85 each
1/2 " " " "	1	00 "
3/4 " " " "	1	50 "

FOR LOOSE PULLEYS



FIG. 1195

SWAIN LUBRICATING CANDLE

Size,	3/8 for the 1/2 inch Cup	Price	per hundred
" 1 1/2	"	" 2 50	"
" 2	"	" 4 00	"
" 2 1/2	"	" 5 00	"
" 3	"	" 8 00	"

The Swain Lubricator is manufactured in different grades to accommodate various speeds of machinery. In ordering note the letter.

Speed of Shaft	250 and less	M
Speed of Shaft	300 to 450	A
Speed of Shaft	500 to 1,000 and over	A A

FOR LOOSE PULLEYS

Speed of Pulleys	Up to 250	M
Speed of Pulleys	Over 250	A A



FIG. 1196

ROCHESTER AUTOMATIC LUBRICATORS

Made in two models, the clutch and ratchet drive, the former being adapted for use on engines of all speeds but especially high speed, one of this model having been in use for two years or more on an engine running at 800 R.P.M.

Both models take the same list prices.

Two-Pint, Single Feed,
Clutch Drive Model

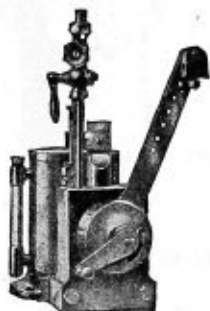


FIG. 1197

List price.....\$30.00

For the lubrication of the cylinders of all types of steam engines and pumps as well as air and ammonia compressors.

Made in all sizes from one-half pint to two gallon and with any number of feeds from one to eight.

Also made with two compartments, for use where different kinds of oil are used in the different cylinders of the same machine, such as air compressors, ice machines, etc.

All sizes fully nickel plated.

All working parts are made of steel and all bearings case-hardened.

Three-Pint, Double Feed,
Ratchet Drive Model

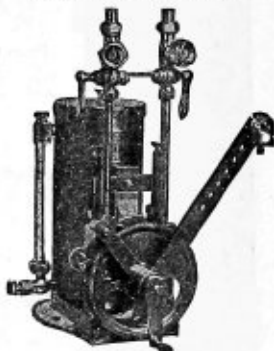


FIG. 1198

List price.....\$50.00

One-Gallon Triple Feed,
Two-Compartment,
Ratchet Drive Model

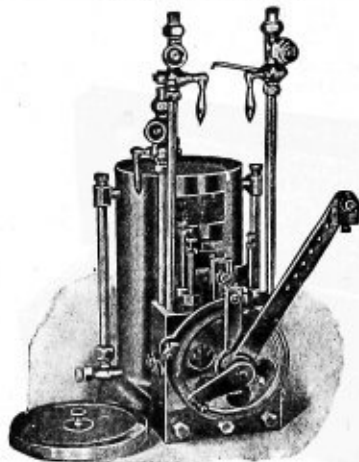


FIG. 1199

List price.....\$85.00

One-Gallon Quadruple
Feed, Ratchet Drive
Model

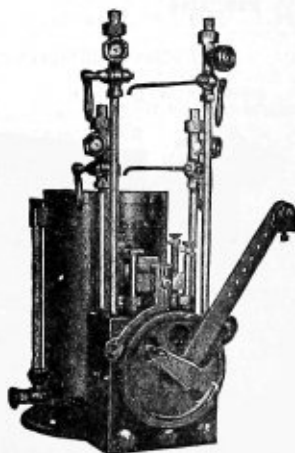


FIG. 1200

List price.....\$100.00

ROCHESTER AUTOMATIC LUBRICATORS—CONTINUED

Sectional View of Pump Block,
Showing Position of
Ball Valves

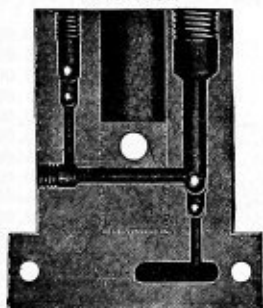


FIG. 1201

All the mechanism of the latest improved Rochester Automatic Lubricator is compactly centered in a steel pump block. The principal working parts are enclosed and protected from dirt, grit, etc.

This block with all the mechanism can be instantly detached and removed, giving easy access to all the working parts for cleaning, repairing, etc., without disturbing the bowl or reservoir attached to the engine.

Absolutely positive in their operation, as there is always a solid column of oil under pressure from the lubricator to the point of delivery, so that when the lubricator starts to operate the oil is forced to its destination.

Each feed regulated independently. Not affected by temperature, pressure or vacuum.

Three-Pint Single Feed Lubricator with
Pump Block Detached for Clean-
ing or Repairing

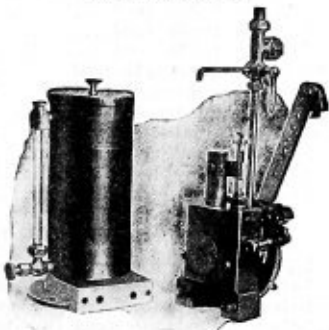


FIG. 1202

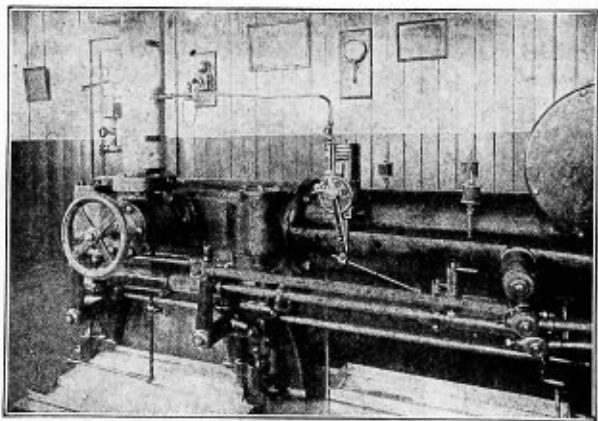


FIG. 1203

Brown Corliss Engine equipped with a three-pint single feed Rochester Lubricator.

PRICE LIST OF

ROCHESTER AUTOMATIC LUBRICATORS

FOR STATIONARY AND MARINE ENGINES AND PUMPS

1/2-Pint single feed.....	\$20.00
1-Pint single feed.....	25.00
2-Pint single feed.....	30.00
3-Pint single feed.....	35.00
1/2-Gallon single feed.....	40.00
1-Gallon single feed.....	45.00
2-Pint double feed.....	45.00
3-Pint double feed.....	50.00
1/2-Gallon double feed.....	55.00
1-Gallon double feed.....	60.00
2-Gallon double feed.....	75.00
1/2-Gallon triple feed.....	70.00
1-Gallon triple feed.....	80.00
2-Gallon triple feed.....	90.00
1/2-Gallon quadruple feed.....	90.00
1-Gallon quadruple feed.....	100.00
2-Gallon quadruple feed.....	105.00
2-Gallon quintuple feed.....	120.00
2-Gallon sextuple feed.....	130.00
2-Gallon septuple feed.....	140.00
2-Gallon octuple feed.....	150.00

FOR AIR COMPRESSORS AND ICE MACHINES

3-Pint double feed two-compartment.....	\$55.00
1-Gallon double feed two-compartment.....	65.00
1-Gallon triple feed two-compartment.....	85.00
1-Gallon quadruple feed two-compartment.....	105.00

The above prices include, besides multiplus sight feeds and check valves, a connecting rod and connection, and an arm or bracket for attaching the lubricator to the engine.

MULTIPLUS SIGHT FEED

Patented April 19, 1904



FIG. 1204

One of these sight feeds is furnished free with each feed of every "Rochester" Lubricator.

IMPROVED VACUUM AND CHECK VALVE



FIG. 1205

One of these check valves, as well as a steam nipple, is furnished with each feed of every "Rochester" Lubricator.

Special steel check valves and nipples, for use on ammonia cylinders will be substituted if so specified on the order.

MADISON-KIPP VALVELESS FORCE FEED LUBRICATORS

MODEL 50

Sight-feed Type



FIG. 1206

Blind-feed Type



FIG. 1207

These lubricators can be furnished in either the sight-feed type or the blind-feed type. They are built rugged and substantial for rough and severe service, and all working parts are under cover, running in oil. There are no joints or packing to work loose and leak oil. The tank is made of sheet steel and the design is neat and attractive.

These lubricators are built on the celebrated KIPP no-valve principle. Over five hundred thousand in daily use in all kinds of service and in all temperatures, are proof positive of their accuracy and reliability. They start and stop with the engine and feed the same always as adjusted. The only care or attention necessary is to fill with oil when needed.

We recommend these lubricators for oiling valves and cylinders on traction engines, hoisting engines, electric light engines, and for oiling cylinder boxes on grain separators, corn shellers, clover hullers, and corn shredders.

Number of Feeds	Capacity Quarts	Shipping Weight	Price Sight-feed Type	Price Blind-feed Type
1	2	20	\$14.00	\$12.00
2	2½	25	18.00	16.00
3	3	30	23.00	20.00
4	3¾	35	28.00	24.00
5	4½	37	33.00	
6	5½	40	38.00	
7	6¼	43	43.00	
8	7	47	48.00	
9	7½	50	53.00	
10	8	55	58.00	
11	8½	57	63.00	
12	9¼	60	68.00	

The blind-feed type is made up only in the single feed.

Above prices are for black finish.

Can furnish nickel plated at small extra charge.

"McCord" FORCE-FEED LUBRICATORS



FIG. 1208

The "McCord" is the simplest lubricator made and is so designed that all parts are easy to get at. It starts, stops and changes speed with the engine and is always ready to force a flow of oil with the first stroke of the piston.

LIST PRICE
CLASS "B" LUBRICATORS MADE IN ANY NUMBER OF FEEDS

No.	Capacity	Feeds	List
1	1 Quart	1 Feed	\$ 25.00
2	1 Quart	2 Feed	30.00
3	2 Quart	1 Feed	28.00
4	2 Quart	2 Feed	35.00
5	2 Quart	3 Feed	42.00
6	2 Quart	4 Feed	49.00
7	1 Gallon	1 Feed	33.00
8	1 Gallon	2 Feed	39.00
9	1 Gallon	3 Feed	45.00
10	1 Gallon	4 Feed	51.00
11	1 Gallon	5 Feed	57.00
12	1 Gallon	6 Feed	63.00
13	1½ Gallons	7 Feed	75.00
14	1½ Gallons	8 Feed	82.00
15	1½ Gallons	9 Feed	90.00
16	1½ Gallons	10 Feed	96.00
17	2 Gallons	11 Feed	108.00
18	2 Gallons	12 Feed	115.00
19	2 Gallons	13 Feed	125.00
20	2 Gallons	14 Feed	135.00

DOUBLE COMPARTMENT LUBRICATORS FOR AIR COMPRESSORS
AND ICE MACHINES

2 Quart	2 Feed	1 Feed in each	\$44.00
2 Quart	3 Feed	2 and 1 Feed in each	50.00
2 Quart	4 Feed	2 Feed in each	57.00
1 Gallon	2 Feed	1 Feed in each	47.00
1 Gallon	3 Feed	2 and 1 Feed in each	54.00
1 Gallon	4 Feed	2 Feed in each	60.00

For Heating Chamber, add \$1.00 to list. For Auxiliary Crank, add \$1.00 to list.

Finish. Lubricators can be furnished in full Nickel Plate or Black Enamel and Brass. In ordering, give finish desired.

Check Valves. Above prices include standard straightway spring check valves. An extra charge is made for special valves to be used where vacuum occurs.

WILLIAMS "WONDER" SIGHT FEED LUBRICATOR

CAST BRASS

FOR GAS, GASOLINE ENGINES AND
AIR COMPRESSORS

FIG. 1209

Number	1	2	3	4	5	6	7
Shank Pipe							
Thread ..inch	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$
Capacity ...ozs.	$1\frac{1}{4}$	$1\frac{1}{2}$	$2\frac{1}{2}$	4	5	10	18
Diameter ...ins.	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Wonder,							
Pol. Brass..ea.	\$3.50	4.00	5.00	6.00	8.00	10.00	12.00
Wonder Nickel							
Plated ....ea.	4.20	5.00	6.00	7.25	9.50	12.00	14.00
Bull's Eye							
Glasses ..doz.	1.20	1.20	1.20	1.20	1.20	1.20	1.20



FIG. 1210

WILLIAMS "WORTHY" GLASS
BODY LUBRICATOR

CAST BRASS

FOR GAS OR GASOLINE ENGINES

Number	$1\frac{1}{2}$	2	3	4	5	6	8
Shank Pipe Thread..inch	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$
Capacity .....ounces	$1\frac{1}{2}$	$2\frac{1}{2}$	4	5	10	18	32
Outside Diam. Glass..ins.	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$	$4\frac{1}{4}$
Height of Glass.....ins.	$1\frac{1}{8}$	$1\frac{1}{8}$	$2\frac{1}{8}$	$2\frac{3}{8}$	3	4	5
Worthy, Fin. Brass...ea.	\$2.00	2.80	3.50	4.00	5.40	7.00	14.00
Worthy, Nick. Plated..ea.	2.40	3.25	4.10	4.60	6.25	8.20	16.40



FIG. 1211

WILLIAMS PLAIN ENGINE
LUBRICATORS

CAST BRASS

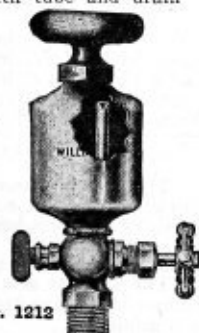
Wyandot
With tube and drain

FIG. 1212

Size	number	00	0	1	2	3	4	5	6	7	8
Shank Pipe Thread..ins.	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$
Capacity .....ounces	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$2\frac{1}{2}$	4	5	10	18	24	24
Diameter .....Inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	4
Wizard, Pol. Brass...ea.	\$2.00	2.20	2.40	2.60	2.90	3.25	3.75	4.75	7.00	10.00	10.00
Wyandot, Pol. Brass...ea.	.....	.....	2.80	3.00	4.50	5.25	6.00	7.50	9.00	12.00	12.00

DETROIT SIGHT-FEED LUBRICATORS

IMPROVED STANDARD

Double Connection



FIG. 1213

Single Connection



FIG. 1214

DOUBLE CONNECTION

The Detroit Improved Standard Double Connection Lubricator is a quality product throughout. In it are all the essentials of a perfect lubricator combined in a compact and well balanced design.

The support arm is in two parts. The part containing the globe valve is first screwed into the steam pipe and the lubricator is then coupled to it. This makes attachment easy and, on account of the globe valve, the lubricator can be removed at any time for any purpose without letting down steam.

The heating passage from the upper sight-feed arm to the support arm passes directly through the body of the lubricator and, being always filled with steam, keeps the oil constantly warm and in a thoroughly liquid condition. This lubricator is well suited for feeding heavy oils.

Capacity	1/8	1/4	1	2	4	8
Size of Thread.....inches	1/2	1/2	1/2	1/2	3/4	3/4
Sight-Feed Glass.....inches	5/8x2 1/8	3/4x3	3/4x3	3/4x3 1/4	3/4x3 1/4	3/4x3 1/4
Gauge Glass	5/8x2 1/8	5/8x3 1/4	5/8x4 3/8	5/8x4 3/8	3/4x6	3/4x7 3/4
Price, Finished .....	.....	.....	.....	.....	.....	.....
Price, Nickel-plated, each	.....	.....	.....	.....	.....	.....

SINGLE CONNECTION

The Detroit Improved Standard Single Connection occupies the same place among single connection lubricators that the double connection holds among double connection lubricators. It has replaced the Style C lubricator.

It is essentially the same as the double connection lubricator, except that it has an equalizing tube made necessary by the single connection.

The support arm is connected to the body at the center of gravity. On this account the connection holds the lubricator very firmly and vibration is reduced to a minimum.

Capacity	1/8	1/4	1	2
Size of Thread.....inches	1/2	1/2	1/2	1/2
Price, Finished .....	.....	.....	.....	.....
Price, Nickel-plated .....	.....	.....	.....	.....

Size of glass, sight-feed, for 1/8 and 1/4-pint, 3/4x2 1/8 inches; pint and quart sizes same as double connection lubricators.

DETROIT SIGHT-FEED LUBRICATORS

1/3 Pint Size

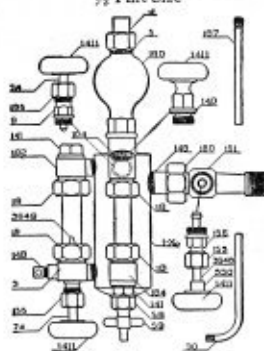


FIG. 1215

1/2 Pint Size

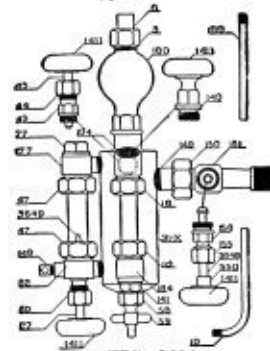


FIG. 1216

DOUBLE
CONNECTION
PARTS

Part No.	Name of Part.	Price.
1-x	Body	\$1.50
3	Lower feed arm	1.00
5	Condenser tail pipe nut	.15
6	Condenser tail pipe	.25
9	Water valve center piece	.25
18	Feed and gauge glass packing nut	.20
22	Globe valve steam follower	.15
30	Oil tube	.25
58	Drain valve body	.35
59	Drain valve stem	.25
74	Feed stem	.25
104	Upper gauge arm (filler)	.75
140	Filler plug	.40
141	1/4 Plug	.25
148	Vent stem	.25
149	Support arm tail pipe	.25
150	Support arm tail pipe nut	.15
151	Support arm	.75
155	Packing nut	.15
156	Globe valve center piece	.25
180	Condenser	1.00
182	Upper feed arm	.75
184	Lower gauge arm	.50
186	Globe valve stem	.25
187	Water tube	.15
542	Feed nozzle	.15
1411	Wood handle	.15
	Gauge glass	.10
	Sight feed glass	.10
	Gaskets (per doz.)	.25

Part No.	Name of Part.	Price.
5	Condenser tail pipe nut	\$0.15
6	Condenser tail pipe	.25
10	Oil tube	.25
18	Gauge packing nut	.20
22	Globe valve stem follower	.15
27	Feed stem	.25
31-x	Body	2.00
32	Lower feed arm	1.00
43	Water valve center piece	.25
44	Water valve stem packing nut	.15
45	Water valve stem	.25
47	Feed glass packing nut	.20
50	Feed stem packing nut	.15
58	Drain valve body	.35
59	Drain valve stem	.25
77	1/4 Plug	.25
104	Upper gauge arm (filler)	.75
140	Filler plug	.40
141	1/4 Plug	.25
148	Vent stem	.25
149	Support arm tail pipe	.25
150	Support arm tail pipe nut	.15
151	Support arm	.75
155	Packing nut	.15
156	Globe valve center piece	.25
177	Upper feed arm	.75
180	Condenser	1.00
184	Lower gauge arm	.50
186	Globe valve stem	.25
188	Water tube	.15
542	Feed nozzle	.15
1411	Wood handle	.15
	Gauge glass	.10
	Sight feed glass	.10
	Gaskets (per doz.)	.25

Be sure to give the piece number and name of the part wanted and the serial shop number (stamped on the upper gauge arm of the Improved Standard Lubricators).

DETROIT SIGHT-FEED LUBRICATORS

DOUBLE CONNECTION PARTS

1 Pint Size. 1 Quart Size

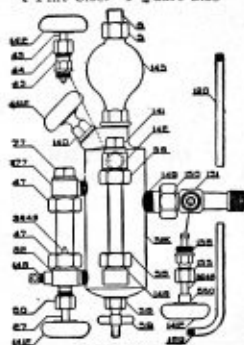


FIG. 1217

1 Pint			1 Quart		
Part No.	Name of Part	Price.	Part No.	Name of Part	Price.
5	Condenser tail pipe nut.....	\$0.15	5	Condenser tail pipe nut.....	\$0.15
6	Condenser tail pipe.....	.25	6	Condenser tail pipe.....	.25
22	Globe valve stem follower....	.15	22	Globe valve stem follower....	.15
27	Feed stem.....	.25	27	Feed stem.....	.25
32	Lower feed arm.....	1.00	32	Lower feed arm.....	1.00
43	Water valve center piece.....	.25	43	Water valve center piece.....	.25
44	Water valve stem packing nut.....	.15	44	Water valve stem packing nut.....	.15
45	Water valve stem.....	.25	45	Water valve stem.....	.25
47	Feed glass packing nut.....	.20	47	Feed glass packing nut.....	.20
50	Feed stem packing nut.....	.15	50	Feed stem packing nut.....	.15
51-x	Body.....	2.50	56	Gauge packing nut.....	.25
56	Gauge packing nut.....	.20	58	Drain valve body.....	.35
58	Drain valve body.....	.35	59	Drain valve stem.....	.25
59	Drain valve stem.....	.25	71-x	Body.....	4.00
77	$\frac{3}{8}$ Plug.....	.25	77	$\frac{3}{8}$ Plug.....	.25
140	Filler plug.....	.40	105	Condenser.....	2.00
141	$\frac{3}{8}$ Plug.....	.25	106	Water tube.....	.15
142	Upper gauge arm.....	.75	107	Oil tube.....	.25
145	Condenser.....	1.50	140	Filler plug.....	.40
146	Lower gauge arm.....	.50	141	$\frac{3}{8}$ Plug.....	.25
148	Vent stem.....	.25	142	Upper gauge arm.....	.75
149	Support arm tail pipe.....	.25	146	Lower gauge arm.....	.50
150	Support arm tail pipe nut....	.15	148	Vent stem.....	.25
151	Support arm.....	.75	149	Support arm tail pipe.....	.25
155	Globe valve packing nut.....	.15	150	Support arm tail pipe nut....	.15
156	Globe valve center piece.....	.25	151	Support arm.....	.75
177	Upper feed arm.....	.75	155	Globe valve packing nut....	.15
186	Globe valve stem.....	.25	156	Globe valve center piece....	.25
189	Oil tube.....	.25	177	Upper feed arm.....	.75
190	Water tube.....	.15	186	Globe valve stem.....	.25
542	Feed nozzle.....	.15	542	Feed nozzle.....	.15
1412	No. 2 wood handle.....	.20	1412	No. 2 wood handle.....	.20
	Gauge glass.....	.10		Gauge glass.....	.10
	Sight feed glass.....	.10		Sight feed glass.....	.10
	Gaskets.....	.25		Gaskets (per doz.).....	.25

Be sure to give the piece number and name of the part wanted and the serial shop number (stamped on the upper gauge arm of the Improved Standard Lubricators).

SWIFT SIGHT FEED LUBRICATORS

Class F. S. C.
Single Connection

FIG. 1218

Class G
Single Connection

FIG. 1219

Class F
Double Connection

FIG. 1220

Class M
Double Connection

FIG. 1221

The lubricating devices illustrated and described on this page are the results of many years' experience in this line, and are offered to the public with the fullest confidence that they will meet the most exacting needs of modern practice.

Swift sight feed lubricators have been on the market for 28 years, during which time they have held an unequalled reputation, and upward of 600,000 have been made and sold throughout the principal markets of the world. They are adopted and used by a large number of the leading engine and steam pump builders of this and other countries, also by the United States government and many of the largest corporations. Valued patented improvements have been made on them from time to time, and the highest quality of material and workmanship have always been put into their construction.

SINGLE CONNECTION

Capacity.....pints	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{2}$	1	$1\frac{1}{2}$	2
Size, thread .....inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Price, F. S. C., finished.....each	.....	\$3.50	\$3.75	\$4.00	\$6.00	\$6.75	\$7.50
Price, F. S. C., nickel-plated.....each	.....	3.90	4.15	4.40	6.65	7.40	8.15
Price, G, finished .....each	\$2.15	.....	2.50	2.90	.....	.....	.....
Price, G, nickel-plated .....each	2.50	.....	2.85	3.25	.....	.....	.....

DOUBLE CONNECTION

Capacity.....pints	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{2}$	1	$1\frac{1}{2}$	2
Size, thread .....inches	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Price, F, finished .....each	\$2.75	\$3.00	\$3.25	\$4.65	\$5.40	\$6.15
Price, F, nickel-plated .....each	3.15	3.40	3.65	5.30	6.05	6.80
Price, M, finished .....each	.....	.....	.....	5.65	6.40	7.15
Price, M, nickel-plated .....each	.....	.....	.....	6.30	7.05	7.80

DETROIT LOCOMOTIVE LUBRICATORS

No. 0—One Feed.



FIG. 1222

No. 5—Two Feed

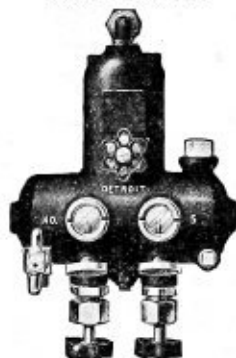


FIG. 1223

No. 22—Three Feed

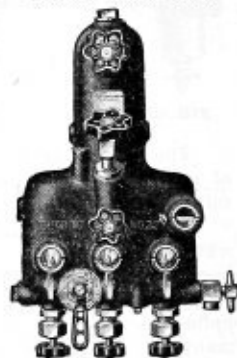


FIG. 1224

The various developments which have been made in locomotive design during recent years have created new conditions and a need for more exact practices in locomotive lubrication. The devices listed below are thoroughly suited to fulfill all the requirements of every style of locomotive from the saturated simple engine to the most modern superheated Mallet. The Detroit No. 22 type of Bull's Eye Lubricators permit locomotives of all kinds to maintain their maximum efficiency in every class of service; at the same time they show a low cost of maintenance and economy in oil.

Number	0	5	12	22	32	42	52	62	72
Capacity	1	1	2 $\frac{1}{2}$	3	4	5	6	7	8
Steam Connection Tail Pipe, bored for O. D. Copper Tubing	$\frac{5}{8}$	$\frac{5}{8}$	1	1	1	1	1 $\frac{1}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$
Feed Connection Tail Pipes, bored for O. D. Copper Tubing	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Prices	each								

"BESTOVALL" OILERS

These Patented Improved Oilers have the collar attached to body of can and cap to spout without soldering or brazing. This makes practically solid joints. Threads are machine cut. New Style Brass Caps and Collars.

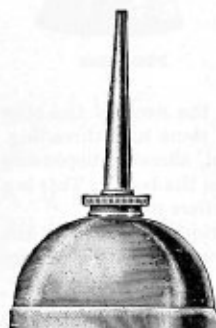


FIG. 1225

COPPER PLATED OILERS



FIG. 1226

No.	12	13	13A	14	14A	14AA	14B	15	15A	16
Steel Oiler, ounces	3	5	5	5	.....	.....	.....	.....	.....	.....
" " pints	.....	.....	.....	.....	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	1	1	1
Diameter, inches	$2\frac{3}{4}$	$3\frac{3}{8}$	$3\frac{3}{8}$	$3\frac{3}{8}$	$3\frac{3}{4}$	$3\frac{3}{4}$	$3\frac{3}{4}$	$4\frac{1}{4}$	$4\frac{1}{4}$	$4\frac{1}{4}$
Size Nozzle	$2\frac{1}{2}$	3	5	9	3	5	9	3	5	9
Price.....per doz.	\$4.50	5.50	6.00	6.50	7.50	8.00	8.50	9.25	9.75	10.50

BRASS OILERS

No.	120	130	130A	140	140A	140M	140B	150	150A	160
Brass Oiler.....oz.	3	5	5	5	.....	.....	.....	.....	.....	.....
" " pints	.....	.....	.....	.....	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	1	1	1
Diameter, inches	$2\frac{3}{4}$	$3\frac{3}{8}$	$3\frac{3}{8}$	$3\frac{3}{8}$	$3\frac{3}{4}$	$3\frac{3}{4}$	$3\frac{3}{4}$	$4\frac{1}{4}$	$4\frac{1}{4}$	$4\frac{1}{4}$
Size Nozzle	$2\frac{1}{2}$	3	5	9	3	5	9	3	5	9
Price.....per doz.	\$6.50	8.00	8.75	9.20	10.20	10.75	11.20	12.00	13.00	14.00

POLISHED STEEL OILERS

No.	P12	P13	P13A	P14	P14A	P14M	P14D	P15	P15A	P16
Steel Oiler, ounces	3	5	5	5	.....	.....	.....	.....	.....	.....
" " pints	.....	.....	.....	.....	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	1	1	1
Diameter, inches	$2\frac{3}{4}$	$3\frac{3}{8}$	$3\frac{3}{8}$	$3\frac{3}{8}$	$3\frac{3}{4}$	$3\frac{3}{4}$	$3\frac{3}{4}$	$4\frac{1}{4}$	$4\frac{1}{4}$	$4\frac{1}{4}$
Size Nozzle	$2\frac{1}{2}$	3	5	9	3	5	9	3	5	9
Price.....per doz.	\$4.50	5.50	6.00	6.50	7.50	8.00	8.50	9.25	9.75	10.50

EAGLE ONE-PIECE SOLID STEEL OILERS

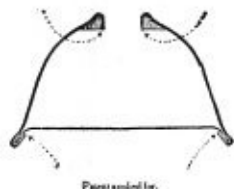


FIG. 1227



FIG. 1228

Referring to outline cut. The arrows at the top point to the neck of the oiler which is formed by turning the top of the body down into same and threading. Same is then backed up or reinforced by a composition metal, thereby dispensing with the old method of soldering or brazing a separate collar to the body. This is a distinctive feature of this oiler and is not found in any other oilers made.

The bottom arrows indicate the point at which the bottom is welded to the body, thus making it an entirely one-piece article, without seams or joints of any kind.

No.	Diameter	Capacity, Pint	Length Nozzle, inches	Per Dozen
2004	3 $\frac{3}{8}$	$\frac{1}{3}$	4	\$5.00
2006	3 $\frac{3}{8}$	$\frac{1}{3}$	6	5.50
2009	3 $\frac{3}{8}$	$\frac{1}{3}$	9	6.00
2012	3 $\frac{3}{8}$	$\frac{1}{3}$	12	6.50
3004	3 $\frac{3}{4}$	$\frac{1}{2}$	4	6.00
3006	3 $\frac{3}{4}$	$\frac{1}{2}$	6	6.50
3009	3 $\frac{3}{4}$	$\frac{1}{2}$	9	7.00
3012	3 $\frac{3}{4}$	$\frac{1}{2}$	12	7.50
4004	4 $\frac{1}{2}$	$\frac{3}{4}$	4	7.00
4006	4 $\frac{1}{2}$	$\frac{3}{4}$	6	7.50
4009	4 $\frac{1}{2}$	$\frac{3}{4}$	9	8.00
4012	4 $\frac{1}{2}$	$\frac{3}{4}$	12	8.50
5004	4 $\frac{5}{8}$	1	4	8.00
5006	4 $\frac{5}{8}$	1	6	8.50
5009	4 $\frac{5}{8}$	1	9	9.00
5012	4 $\frac{5}{8}$	1	12	9.00

Nozzles 6 inches or longer are shipped bent unless ordered straight. All nozzles interchangeable. Order by number to avoid mistakes. Solid cut brass bushing. For price nickel-plated add \$2.00 to list.

"RICHARD" SOLDERLESS BOTTOM AND COLLAR OILER

The bottom and collar are put in without cement, solder or brazing. It is so constructed that it is practically in one piece. It is impossible to make this can leak by dropping it or throwing it on the floor. It is made of the best cold rolled steel, brightly polished and lacquered, and is the strongest can made of its weight. We claim that it will save from waste of oil ten times its cost.

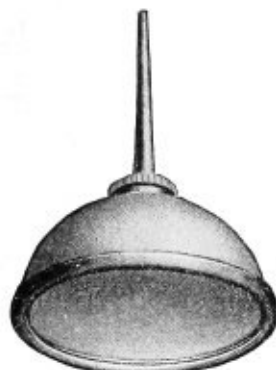


FIG. 1229

ALL OILERS AND SPOUTS INTERCHANGEABLE PRICES, OILERS COMPLETE

				EXTRA SPOUTS	
1/3 pint size 3 3/4 inch diameter	{	No. 13-3	3 inch spout \$ 5.50 per dozen		
		No. 13-4	4 inch spout 5.75 per dozen		
		No. 13-5	5 inch spout 6.00 per dozen	3 inch, \$2.75 per dozen	
		No. 13-6	6 inch spout 6.25 per dozen	4 inch, 3.00 per dozen	
1/2 pint size 3 3/4 inch diameter	{	No. 13-9	9 inch spout 6.50 per dozen		
		No. 14-3	3 inch spout \$ 7.50 per dozen		
		No. 14-4	4 inch spout 7.75 per dozen	5 inch, \$3.25 per dozen	
		No. 14-5	5 inch spout 8.00 per dozen	6 inch, 3.50 per dozen	
1 pint size 4 1/2 inch diameter	{	No. 14-6	6 inch spout 8.25 per dozen		
		No. 14-9	9 inch spout 8.50 per dozen		
		No. 15-3	3 inch spout \$ 9.25 per dozen		
		No. 15-4	4 inch spout 9.50 per dozen		
3 and 5 inch straight All others bent unless otherwise specified	{	No. 15-5	5 inch spout 9.75 per dozen	9 inch, \$4.25 per dozen	
		No. 15-6	6 inch spout 10.00 per dozen	12 inch, 5.75 per dozen	
		No. 15-9	9 inch spout 10.50 per dozen		
		No. 15-12	12 inch spout 12.50 per dozen		

Nos. 13 and 14 packed 1 dozen in a box
No. 15 packed 1/2 dozen in a box

CHACE'S PATENT ZINC OILERS

Trade No.	Dia. of Bottom	Height of Body	Length of Spout from Top of Spout Screw	TIN BOTTOMS	
				Stock No.	Price Per Doz
00	2 3/4	1 1/2	2 3/4	31	\$1.00
0	2 7/8	1 3/4	2 7/8	32	1.25
1	2 5/8	2 1/8	2 5/8	33	1.50
1 1/2	2 7/8	2 3/4	3	34	1.75
2	3 3/8	2 3/4	4 1/8	35	2.00
3	3 1/2	2 7/8	4 3/8	36	2.25
4	4 3/8	3 3/8	4 7/8	37	2.75
5	4 3/8	3 3/8	4 7/8	38	3.50
6	4 3/4	3 3/4	4 7/8	39	4.50

No. 00 and 0 Oilers are packed in boxes containing 1 dozen each. Nos. 1, 1 1/2, 2, 3, 4, 5 and 6 in boxes containing 1/2 dozen each.



FIG. 1230

THE ORIGINAL AND GENUINE CANNON OILER

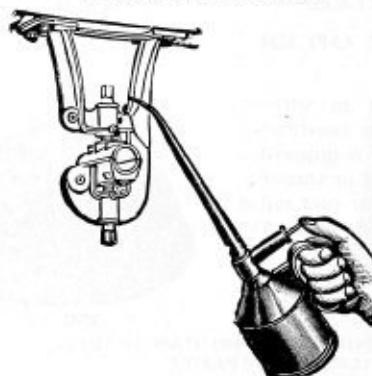


FIG. 1221



The Genuine Cannon Oiler meets a long felt demand for an oil can in which the oil is entirely controlled by the operator in whatever position the can may be held. In this can is combined quickness, convenience and economy. Quick, because you do not have to wait for the oil to slowly trickle out, as it is forced out by simply pressing on the plunger. Convenient, because the can may be held in an easy, natural position, thereby enabling the operator to hold the nozzle in the proper place for oiling the bearing.

No.	Capacity, Pnts.	Diameter, Inches.	Extreme Height, Inches.	Length of Spout, Inches.	Kind of Material	Price, Each	Price, Per Dozen
0	1	3½	9¼	6	Tin	\$0.85	\$10.00
1	1	3	12½	8	Tin	.85	10.00
2	1½	3½	17¼	12	Tin	.95	11.00
2½	2	4	18	12	Tin	1.00	12.00
3	2	4	26	20	Tin	1.10	13.00
0	1	3½	9¼	6	Brass	1.35	16.00
1	1	3	12½	8	Brass	1.35	16.00
2	1½	3½	17¼	12	Brass	1.50	18.00
2½	2	4	18	12	Brass	1.70	20.00
3	2	4	26	20	Brass	1.75	21.00

EXTRA PARTS

Oiler No.	0	1	2	3
Tin spouts, complete with pump.....each	\$0.35	\$0.45	\$0.60	\$0.75
Brass spouts, complete with pump.....each	.50	.60	.75	1.00
Pump plungers, complete.....each	.15	.15	.15	.15
Pump leathers.....per dozen	.15	.15	.15	.15
Plunger springs.....per dozen	.60	.60	.60	.60
Extra tin tips for No. 3 spouts, 6½" long.....	.60	.60	.60	.60
Extra brass tips for No. 3 spouts, 6½" long.....	1.00	1.00	1.00	1.00

The Cannon Oiler is always ready for use. The spout will never clog up from the fact that it is always full of oil. Even if the spout is used to clean out the oil cups one pressure on the plunger starts the oil.

HOWLAND PUMP OILER

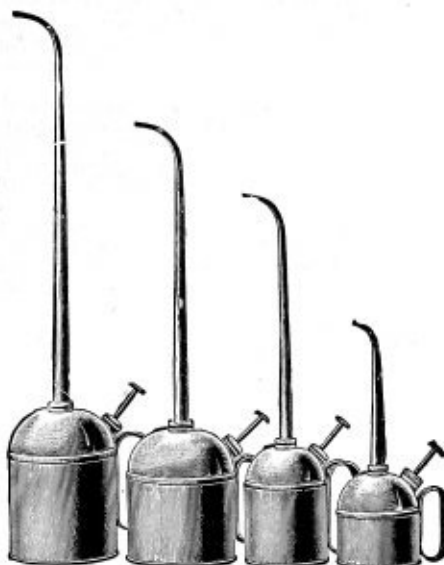


FIG. 1232

The Howland Oiler is made with a pump containing two valves working automatically, which forces the oil to the bearings quickly and in just the quantity desired. With the pump oiler, the oil can be applied to machinery while in motion as well as oiling an overhead bearing from the floor. This is the only pump oiler on the market made with and without a union spout connection; those with connection being made from bar brass containing cut threads.

WITH SOLID SPOUTS

Capacity, Pints	Diameter, Inches	Tin		Copperized		Brass	
		No.	Per Dozen	No.	Per Dozen	No.	Per Dozen
$\frac{1}{2}$	3	320	\$9.80	420	\$16.25	520	\$20.00
1	3	321	11.75	421	18.00	521	23.00
1	3	322	12.00	422	18.25	522	23.25
$1\frac{1}{2}$	4	323	15.55	423	22.00	523	26.75
2	4	324	17.45	424	24.00	524	30.50
2	4	325	17.70	425	24.25	525	30.75

WITH DETACHABLE SPOUTS

Capacity, Pints	Diameter, Inches	Tin		Copperized		Brass	
		No.	Per Dozen	No.	Per Dozen	No.	Per Dozen
$\frac{1}{2}$	3	300	\$15.25	400	\$23.00	500	\$26.80
1	3	301	17.80	401	25.00	501	30.30
1	3	302	17.50	402	25.25	502	30.50
$1\frac{1}{2}$	4	303	21.75	403	29.50	503	34.75
2	4	304	24.00	404	32.00	504	39.00
2	4	305	24.25	405	32.25	505	39.25

ACME SPRING OILER**MADE OF XXX BRIGHT CHARCOAL TIN PLATE**

The Acme oil can is the best and mechanically the best constructed oil can that has been invented up to the present time. The flow of oil is instantly stopped by the air-tight valve at lower end of spout.

In oiling many kinds of machinery the spout of the oil can is necessarily pointed downward and in using the common can as much oil runs on the ground or floor as is used for the machine. This can saves all this loss and annoyance, as no oil escapes from it until pressure is applied to thumb-piece.

After oiling, open valve and drop oil back into can.

The spout, if broken off close to can, will not injure the valve and can be replaced or repaired easily by any ordinary mechanic. This is an advantage over all other shut-off or valve cans.

No. —	1	2	3
Capacity	1 Pint	1 Quart	2 Quarts
Price	per doz. \$.....	.....	.....



FIG. 1233

**EAGLE POLISHED STEEL
RAILROAD OILER****WITH VALVE**

There are but two pieces to the body of this oiler; the bottom which is double seamed to the body, and the body itself, which is ONE PIECE from its bottom edge to the top edge of the threaded neck.

When the thumb piece is pressed downward the disc on the end of the curved wire is raised from its seat, permitting the flow of oil. When the thumb piece is released the disc is reseated, shutting off the oil.

The threaded collar, which forms the union between the body of the can and the spout, turns upon the threaded neck of the oiler, and can be tightened or loosened at will.

When loosened, the spout can be turned in any desired position, and remains so, fixed and immovable when the collar is tightened up. This is a feature that will appeal to any engineer.

NO. 400—LOCOMOTIVE VALVE OILER

Capacity	.....	1 quart
Length of Spout	.....	23 1/2 inches
Height Over All	.....	29 1/2 inches
Diameter	.....	4 1/8 inches
Diameter Filler Opening	.....	1 inch
Diameter Spout Opening	.....	1 1/8 inch
Per dozen (list)	.....	\$14.00

Weight per dozen, about 25 pounds.

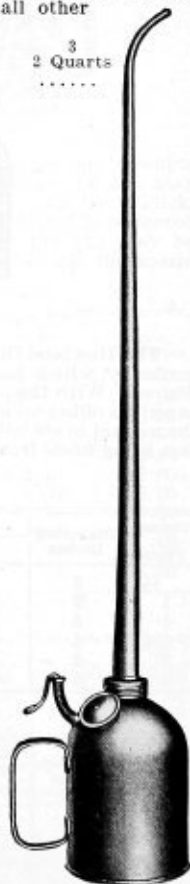


FIG. 1234

CANNON LONG SPOUT OILERS

The genuine Cannon, long spout type Oiler is particularly useful around machine shops and factories for lubricating shafting hangers, motors and mechanism attached to the ceiling. It does away with the use of a ladder and saves the time of the operator and protects him from entanglement in the shafting. In use, the tip of the spout is used to clean out the oil well on the bearing, and a light pressure on the pump immediately forces any quantity of oil from a drop to a tablespoonful. Economical, safe and fast.



FIG. 1235

½ Gal. 20 inch Spout, Brass.....	List price each \$ 7.50
½ Gal. 3 foot Spout, Brass.....	List price each 8.50
½ Gal. 6 foot Spout, Brass.....	List price each 10.50
½ Gal. 9 foot Spout, Brass.....	List price each 12.00
½ Gal. 12 foot Spout, Brass.....	List price each 15.00
½ Gal. 15 foot Spout, Brass.....	List price each 22.50

NUGENT SHAFT OILER

Oils your shafting boxes from the floor.

Prevents accidents and saves time.

Net price for pump, can and nozzle.....\$6.00

Extra for tubing.....per foot .20

When ordering, state distance from floor to shaft.



FIG. 1236

RAILROAD OILERS SEAMLESS DRAWN BODIES

Nos. 10, 11, 17, 18 & 18A

Nos. 101 & 111



FIG. 1237

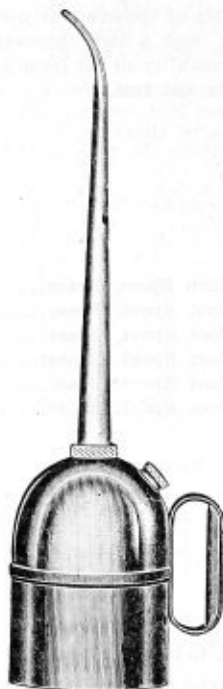


FIG. 1238

COPPER PLATED RAILROAD OILERS

- No. 10. 1 Pint, $3\frac{3}{8}$ inch diameter, 5 inches high, 12 inch nozzle. .per dozen \$14.00
 No. 11. 1 Quart, $4\frac{1}{8}$ inch diameter, 6 inches high, 18 inch nozzle. .per dozen 18.00

BRASS RAILROAD OILERS

- No. 17. 1 Pint, $3\frac{3}{8}$ inch diameter, 5 inches high, 12 inch nozzle. .per dozen \$18.00
 No. 18. 1 Quart, $4\frac{1}{8}$ inch diameter, 5 inches high, 18 inch nozzle. .per dozen 21.00
 No. 18A. 2 Quart, 5 inch diameter, 8 inches high, 18 inch nozzle. .per dozen 24.00

STEEL RAILROAD OILERS

- No. 101. 1 Quart, $4\frac{1}{8}$ inch diameter, 6 inches high, 10 inch nozzle. .per dozen \$18.00
 No. 111. 2 Quart, 5 inch diameter, 8 inches high, 10 and 14 inch nozzle. .doz. 20.00

Perfection



FIG. 1239

LOCOMOTIVE OILERS PERFECTION LOCOMOTIVE

Price per Dozen		Tin	Brass	Copper Plated
1½ Pt.	10 in. Spout	\$ 7.50	\$16.00	\$12.00
1 Qt.	15 in. Spout	9.00	18.00	14.00
3 Pt.	15 in. Spout	10.00	20.00	16.00

PLAIN LOCOMOTIVE

Made in Tin Only

Price per Dozen	1 Pt.	1 Qt.	2 Qt.
Made with Stationary Spout	\$4.00	\$5.00	\$7.50

Plain



FIG. 1240

ENGINEERS' TIN DRIP OILERS

These oilers are made from steel having a bright polished tin finish. The spout being on the side of the oiler makes a distinctive feature which permits of all the oil being poured from the oiler while in a horizontal position. Twenty per cent more bearings can be oiled with this oiler than with the drip oiler having a center spout.

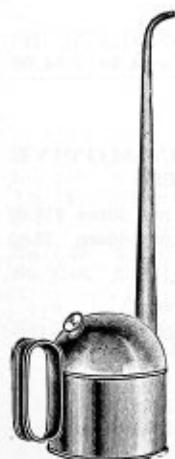


FIG. 1241

No.	Pint	Diameter Inches	Spout, Inches	Pounds	Per Dozen
61	1	3	12	5½	\$3.00
71	1½	4	14	7	3.50
81	2	4	16	8	4.00

EAGLE WELDED STEEL HAND OILERS

Pyramid
Nos. 20 & 31Broad Top
Nos. 20 to 23THESE OILERS HAVE AN AIR VENT
TO CONTROL FLOW OF OIL

BROAD TOP OILERS

No.	Capacity	Style Nozzle	Per Dozen
20	1 Pint	10 inch straight	\$12.00
20A	1 Pint	10 inch bent	12.00
22	1 Quart	12 inch straight	13.00
22A	1 Quart	12 inch bent	13.00
22AA	1 Quart	18 inch straight	14.00
22B	1 Quart	18 inch bent	14.00
23	2 Quart	18 inch straight or bent	15.00



FIG. 1242



FIG. 1243

PYRAMID OILERS

No.	Capacity	Per Dozen
30	1 Pint 8 in. Spout	\$ 9.00
31	1 Quart 10 in. Spout	10.00

EXTRA NOZZLES FOR EITHER STYLE

Length	inches	8	10	12	18
Per dozen		\$2.75	3.00	3.50	4.00



FIG. 1244

WELDED STEEL LOCOMOTIVE
TALLOW POTS

No. 40.	2 Quart.	per dozen	\$15.00
No. 41.	4 Quart.	per dozen	18.00



FIG. 1245

WELDED STEEL PYRAMID
FILLERS

No. 42.	1 Pint	per dozen	\$ 9.00
No. 43.	1 Quart	per dozen	10.00
No. 44.	2 Quart	per dozen	12.00

ENGINEERS' FILLERS



FIG. 1246

ENGINEERS' COPPERIZED FILLERS

No. 19.	1	Pint	.....	per dozen	\$14.00
No. 19A.	1½	Pint	.....	per dozen	17.00
No. 210.	1	Quart	.....	per dozen	20.00
No. 211.	2	Quart	.....	per dozen	24.00

ENGINEERS' BRASS FILLERS

No. 170.	1	Pint, 4¼ inch diameter, 3½ inch high screw top	.....	per dozen	\$18.00
No. 190.	1½	Pint, 4¾ inch diameter, 4 inch high screw top	.....	per dozen	22.00
No. 200.	1	Quart, 5 inch diameter, 5 inch high screw top	.....	per dozen	30.00
No. 201.	2	Quart, 6 inch diameter, 6 inch high screw top	.....	per dozen	34.00

TALLOW POTS



FIG. 1247

COPPER PLATED

No. 212.	1	Quart	.....	per dozen	\$21.00
No. 213.	2	Quart	.....	per dozen	25.00

ENGINEERS' SETS

WELDED STEEL

No. 140.	5	Pieces, Pol. Steel, incl. Tray	... \$ 7.00
No. 141.	6	Pieces, Pol. Steel, incl. Tray	... 9.00

COPPER PLATED

No. C30.	5	Pieces, Cop. Plated, incl. Tray	... \$ 5.00
No. C40.	6	Pieces, Cop. Plated, incl. Tray	... 7.00

NICKEL PLATED

No. N50.	5	Pieces, N. P. Steel, incl. Tray	... \$ 7.00
No. N60.	6	Pieces, N. P. Steel, incl. Tray	... 10.00

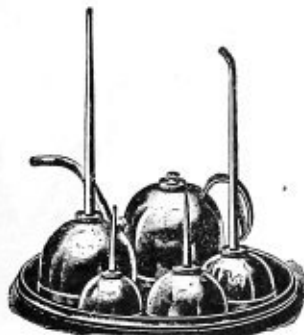


FIG. 1248

WELDED STEEL SUPPLY CANS

Screw Top
Nos. 60 to 64

FIG. 1249

SCREW TOP			MILK CAN TOP		
No.	Cap. Gals.	Price Each	No.	Cap. Gals.	Price Each
60	1	\$2.00	65-H	1	\$2.50
61	2	2.50	66-H	2	3.00
62	3	3.00	67-H	3	3.50
63	4	3.50	68-H	4	4.00
64	5	4.00	69-H	5	4.50

Milk Can Top
Nos. 65-H to 69-H

FIG. 1250

PIT CAR OILERS

Used at mines and quarries where heavy oils are used on sheave wheels, idlers, etc., or at blast furnaces for oiling ore buggies, tram cars, etc.

Absolutely impervious to heat.

Practically indestructible.



FIG. 1251

½ Gallonper dozen \$18.00

1 Gallonper dozen 24.00

SEAMLESS TORCHES

Locomotive
Nos. 110-110A

FIG. 1252

Pyramid
Nos. 81 & 82

FIG. 1253

LOCOMOTIVE TORCHES

Per dozen

No. 110. For 1½ in. wick. \$9.00

No. 110A. For 5/8 in. wick. 9.00

With wick guard, extra. 1.50

PYRAMID TORCHES

Per dozen

No. 81. 1 Pint\$ 9.00

No. 82. 1 Quart 10.00

COPPER PLATED STEEL INSPECTORS AND LOCOMOTIVE TORCHES

No. 26



FIG. 1254

Nos. 27 and 28



FIG. 1255

- No. 26. 1 pint, 2 inch diameter, 15 inches high.....per dozen \$12.00
 No. 27. 1½ pint, 4½ inch diameter, 4½ inches high.....per dozen 12.00
 No. 28. 1 quart, 4 ounces, 5¼ inch diameter, 4½ inches high..per dozen 15.00

EAGLE WELDED STEEL HANDLED SHOP TORCHES



FIG. 1256

Made of Heavy Sheet Steel,
Black Enameled

No. 100. Handled Shop Torches.

- Capacity—1 pint.
 Length of Handle—9¾ inches.
 Diameter—3½ inches.
 Height to Top of Cap—5 inches.
 Length of Spout—6¾ inches.
 Diameter of Spout Opening—½ inches.
 Diameter of Filler Opening—1¾ inches.

Per dozen (List).....\$12.00

Weight, per dozen, about 15 pounds.

"GACO" MINE OILERS



FIG. 1257

Ferrules, handle and spout of malleable iron. A very durable and effective oiler, which prevents waste when putting oil in the wheel.

	Seamless Steel	Brass
List—1 Pint capacity	\$4.00	\$6.00
List—1 Quart capacity	5.00	7.50

TWENTIETH CENTURY INDUSTRIAL AND MINE CAR OILERS



FIG. 1258

The Twentieth Century Oiler is a Special Heavy Galvanized Iron Pail, holding $2\frac{1}{2}$ gallons of oil, having a brass pump fastened to the lid, so that the operator can instantly force on the axle or into the oil box from a teaspoonful to a half pint of oil.

Each Oil Pail is supplied with three side and end opening nozzles, suited for plain, center oiling, or push button mine car wheels.

No. 1 is an Iron Nozzle, made of $\frac{1}{4}$ -inch gas pipe, having an outside diameter of $\frac{1}{2}$ inch.

No. 2 is a Brass Spring Nozzle, made of $\frac{1}{4}$ -inch brass pipe, having an outside diameter of $\frac{1}{2}$ inch.

No. 3 is an Iron Nozzle, made of $\frac{1}{4}$ -inch gas pipe, having an outside diameter of $\frac{3}{8}$ inch.

List Priceeach \$10.00

$\frac{1}{2}$ and $\frac{3}{4}$ Gallon 1 and $1\frac{1}{2}$ Gallon



FIG. 1259



FIG. 1260

IRONSIDES IMPROVED TORMAY OILERS

Primarily constructed for the oiling of Mine Car Wheels, its benefits have been so pronounced, as to cause its adoption for a wide range of applications in operating departments, among which may be cited—Rolling Mills, General Machinery, Locomotives, Stationary Engines, Motors, Hoisting Drums, Shafting, Sheaves, Guides, Slope Rollers, Steam Cars, Street Cars, and in fact all places where ordinary oil cans are applicable. No Mining, Manufacturing, or other Industrial Institution can afford to be without this Oil Saver.

SIZES— $\frac{1}{2}$ GALLON AND $\frac{3}{4}$ GALLON

Discharge—1-20 oz. to $1\frac{1}{4}$ oz. each operation, dependent upon adjustment, speed of operation and consistency of oil. Nozzle— $\frac{1}{2}$ gallon size, 12 inches long; $\frac{3}{4}$ gallon size, 5 inches long. Weight—Boxed, 7 and 9 pounds, respectively.

$\frac{1}{2}$ galloneach \$5.75
 $\frac{3}{4}$ galloneach 6.25

SIZES—1 GALLON AND $1\frac{1}{2}$ GALLON

Discharge—1-20 oz. to $1\frac{1}{4}$ oz. and $\frac{3}{4}$ oz. to $3\frac{1}{2}$ oz. respectively, each operation, dependent upon adjustment, speed of operation and consistency of oil. Nozzle—5 inches long. Weight—Boxed, 10 and 13 pounds, respectively.

1 galloneach \$8.00
 $1\frac{1}{2}$ galloneach 9.50

BESTOVALL GALVANIZED OIL CANS

WITH SPOUT

WITH FAUCET



FIG. 1261



FIG. 1262

Capacity	gallons	1	2	3	5	10
Price, with Spout	per dozen	\$4.00	6.50	9.00	12.00	.....
Price, with Faucet	per dozen	.....	\$12.00	15.00	18.00	.....

TIN, WOOD JACKET, OIL CANS



FIG. 1263

Capacity	gallons	1	2	3	5	10
Price	per dozen	\$5.40	6.60	8.40	10.20	18.00

OIL FUNNELS AND MEASURES



FIG. 1264



FIG. 1265

FUNNELS GALVANIZED IRON OR XXXX TIN

Capacity	1 Qt.	2 Qt.	1 Gal.	2 Gal.	3 Gal.	5 Gal.
Price, Galvanized	each	.....	.....	.....	.....	.....
Price, Tin	each	.....	.....	.....	.....	.....

MEASURES

Capacity	1 Pt.	1 Qt.	2 Qt.	1 Gal.	2 Gal.	3 Gal.	5 Gal.
Price, Galvanized	each	.....	.....	.....	.....	.....	.....
Price, Tin	each	.....	.....	.....	.....	.....	.....

THE WHITE STAR OIL FILTER

ROUND TYPE

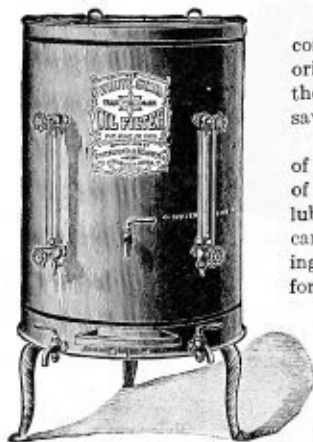


FIG. 1266

The cost of a White Star Oil Filter is so small in comparison to the savings effected by its use that the original investment is repaid within a few weeks, and thenceforth the oil economy continues as a large net saving in operative expense in any power plant.

Perfect lubrication requires that a copious supply of oil be fed to the bearings. Only a small percentage of the total oil fed is actually worn out in the work of lubrication; the remainder passes away at the drips, carrying with it more or less dirt or grit. By removing this foreign matter, the oil may be made suitable for feeding again to the bearings.

The White Star Oil Filter does its work of purifying dirty oil so that it may be used over and over in the bearings until actually worn out in the work of lubrication. With this filter in use the lubrication of bearings may be done much better than without it, inasmuch as the oil may be used more freely, knowing that none is wasted.

Net reductions of from 50 to 75 per cent in oil bills are regularly effected upon installation of a White Star Oil Filter, the amount of saving depending upon the state of affairs before the filter is used and upon the extent to which advantage is taken of its presence afterward.

The White Star Oil Filter is built upon original lines and differs radically from all other filtering devices. All parts are readily accessible for examination and removable for cleaning so that it is easily kept in perfect condition for highest efficiency. The filtering medium is a specially prepared cloth wrapped around a perforated cylinder. This is a construction superior to any other in efficiency and simplicity.

PRICE LIST

Number	Filtering Capacity—Gallons per Day	Capacity, Gallons			Dimensions		List
		Pure Oil	Dirty Oil	Water	Diameter, Inches	Total, Height, Inches	
2	40	7½	5½	5	16	34	\$35.00
4	70	9½	7½	6½	18	37	50.00
5	100	12	10	9	20	38	60.00
7	150	15	13	12	22	40	75.00
10	175	19	17	16	24	44	85.00
12	200	25	18	20	26	47	100.00

The filtering capacity of the White Star, under normal working conditions, always equals that given in the table, and is secured without pouring in dirty oil and drawing off the purified oil almost constantly, which is positively necessary in filters with smaller storage capacity.

WHITE STAR OIL FILTER



FIG. 1267

**DUPLEX AND
MULTIPLEX
TYPES**

ESPECIALLY DE-
SIGNER FOR OILING
SYSTEM SERVICE

In the operation of the duplex and multiplex type filters, the impure oil enters the auxiliary tank on top of the main body, is drained through a removable screen located therein, and then passes out through the spigot at the bottom into a funnel suspended in the central compartment of the machine.

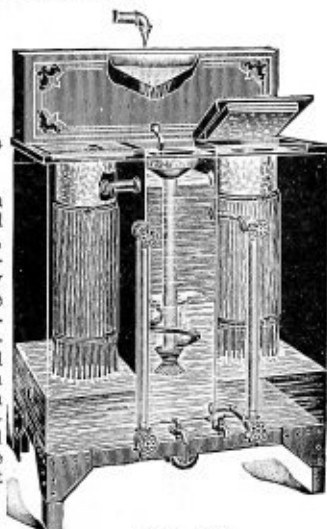


FIG. 1268

This chamber is partially filled with water, kept at a moderate temperature by means of a steam coil entering from the back.

The waste oil descending the funnel tube is discharged below the surface of the water, in an upward direction, through the perforations in the conical foot, thus leaving the sediment at the bottom of the chamber undisturbed.

By the continued action of the heat, the oil becomes thinned so that all water and heavy impurities are rapidly separated from it by gravity, the water being automatically carried off by an overflow pipe at the back, while the dirt or impurities, accumulating at the bottom of the chamber, are flushed out occasionally through the drain connection.

Number of Filter	Filtering Capacity Gallons Per 24 Hours	Holding Capacity Gallons			List Price	Shipping Weight Pounds
		Pure Oil	Dirty Oil	Water		
16	300	13	10	8	\$ 95.00	190
17	500	38	11	8	125.00	285
20	650	64	17	14½	150.00	400
23	850	50	30	25	300.00	620
25	1000	103	40	45	400.00	850
27	1700	100	40	25	500.00	1000
50	2000	115	105	67	600.00	1500
100	4000	235	125	90	800.00	2000
150	6000	353	182	119	1000.00	2500
200	8000	476	257	177	1200.00	3000
250	10000	589	320	236	1500.00	3600
300	12000	710	365	236	1800.00	4200

Concentric filtering cylinders practically double the rated capacities, and are furnished at a slight advance in price.

WHITE STAR OIL FILTER—MULTIPLEX TYPE NOS. 100 TO 300

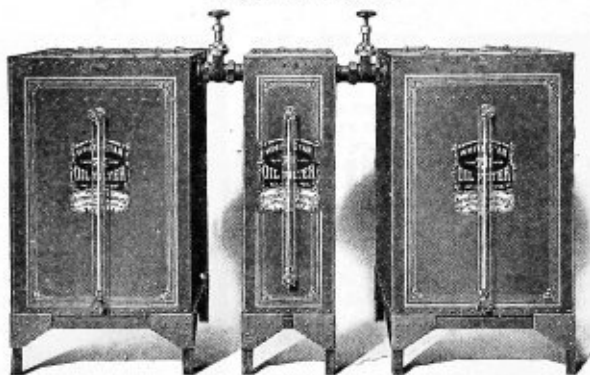


FIG. 1269

The Multiplex Type White Star Filter is designed to meet the demand in the larger power stations for great capacity in limited area (and is the only apparatus which can perfectly purify lubricating oil in quantity).

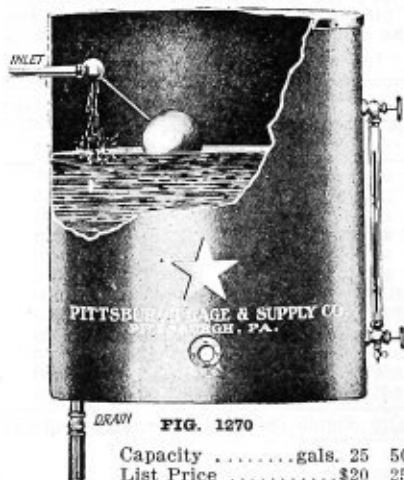
The separating chamber is entirely independent of the filtration and storage chambers, the communicating pipes being controlled from the outside.

In the storage chambers numbers of filtering cylinders are suspended in such manner that they may be detached individually for cleaning without in any way interrupting the operation of the others.

Multiplex Filters are formed around angle iron frame work, the bodies being made of heavy galvanized iron, with all seams riveted and calked.

The same flexibility in installation and handling is available with this type as in the Duplex Filter, and it may be adapted to varying conditions.

For list prices see page 461.



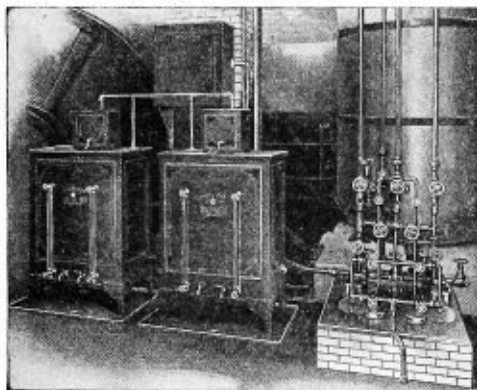
OIL STORAGE RESERVOIRS

These Reservoirs are made of heavy galvanized iron, the joints being lapped, closely riveted and brazed. The larger sizes are built around angle-iron framework. Made with hinged lid, and provided with necessary pipe openings, the flanges being riveted to the body of the Reservoir. They are equipped with heavy gage to indicate level of oil, within, and with our special overflow attachment so arranged that any excess of oil pumped up to Reservoir is drained back to the Filter. Painted and striped to correspond to White Star Filters.

FIG. 1270

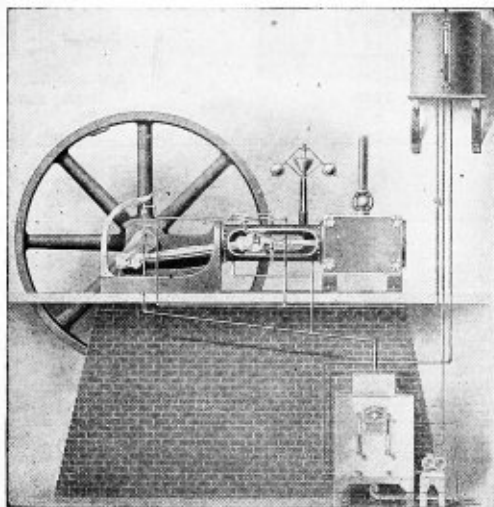
Capacity	gals.	25	50	75	100	125	150	200	250	300	500
List Price		\$20	25	30	35	40	45	50	60	75	100

WHITE STAR OILING SYSTEMS

**FIG. 1271**

A Typical Installation of White Star Oil Filters.

When properly installed, White Star Oil Filters and oiling systems will save 50 to 80 per cent in oil consumption. Tell us the number, size and horsepower of your engines or machinery to be oiled, and we will submit an estimate on necessary oiling system materials.

**FIG. 1272**

Practical Method of Installing a White Star Continuous Oiling System.

OIL CABINETS

Two Compartments, Sloping Top



FIG. 1273

Sloping Top



FIG. 1274

Combination Sloping and Flat Top



FIG. 1275

Flat Top



A 60 GALLON FACTORY OIL CABINET

FIG. 1276

Gals.	Price			Size in Inches, Flat Top	Height, Inches	Size in Inches, Sloping Top	Height at Back, Inches
25	\$30.00	One	Compartment.....	22 x 22	30	20 x 22	49
40	35.00	One	Compartment for one barrel...	25 x 28	30	22 x 31	49
110	45.00	One	Compartment for two barrels...	25 x 47	39	26 x 41	49
120	55.00	Two	Compartments for two barrels...	26 x 52	39	26 x 49	49
160	50.00	One	Compartment for three barrels...	26 x 66	39	28 x 53	49
170	60.00	Two	Compartments for three barrels...	28 x 84	39	28 x 57	49
180	70.00	Three	Compartments for three barrels...	26 x 76	39	26 x 71	49
210	65.00	One	Compartment for four barrels...	30 x 73	39	34 x 55	49
220	65.00	Two	Compartments for four barrels...	30 x 77	39	34 x 60	49
260	60.00	One	Compartment for five barrels...	30 x 89	39	34 x 69	49
270	70.00	Two	Compartments for five barrels...	30 x 94	39	34 x 71	49
300	100.00	Five	Compartments for five barrels...	30 x 106	39	30 x 82	49

NOTE—All Cabinets supplied with tin pumps, or four feet of rubber tubing for filling Cabinets, as preferred. Sloping Top Cabinets with set of measures.

Each compartment, as will be seen from the above list, holds ten gallons more than the number of full barrels it is made for.



FIG. 1277

PERFECTION OIL TANKS AND PUMPS

Corrugated; with steady stream pumps, which can be detached and used for pumping oil from barrel to tank. Each tank furnished with a 1 pint, 1 quart and 2 quart tin measure and a 1 quart tin funnel, unless otherwise specified.

OIL TANKS

Capacity, Gallons, Tank.....	30	60	106
List price .....each	\$10.00	12.00	14.00

OIL PUMPS

Number	15	20	25
Length .....inches	33	38	47
Fits Tank .....gallons	30	60	106
List Price .....each	\$ 2.00	2.50	3.00

Pump



FIG. 1278

GASOLINE STORAGE TANKS

GALVANIZED--JAPANNED

Corrugated bodies and bottoms. Iron threaded caps and brass faucets with keys.

Gallons	36	63	111
List Price .....each	\$10.00	12.00	14.00



FIG. 1279



FIG. 1280

PEERLESS SAFETY CAN

For gasoline, benzine and naphtha and all inflammable liquids.

Inspected, approved and labeled by Underwriters Laboratories, Inc.

Easy to fill and pours with a full, steady stream.

One Pint	each	\$1.50
One Quart	each	1.75
Two Quarts	each	2.25
One Gallon	each	2.50
Two Gallons	each	3.35
Three Gallons	each	4.40
Five Gallons	each	5.50

AMERICAN GASOLINE STORAGE OUTFITS FOR PRIVATE GARAGES

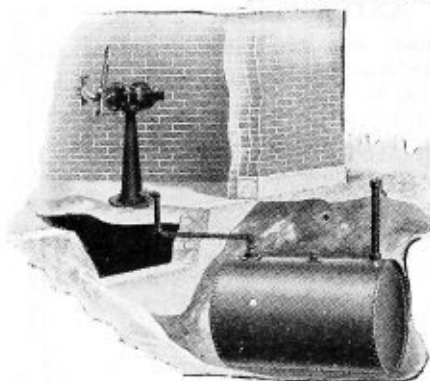


FIG. 1281

(Cut No. 16)

CUT 4—"LITTLE MONITOR" OUTFITS

Double-acting, continuous flow pump. Pump is operated by means of a lever working back and forth horizontally, discharging a continuous flow of gasoline very rapidly. Pump is very substantial, and built of best materials throughout. Filter Hose and Nozzle furnished when required. Storage Tank of any size or capacity desired.



FIG. 1282

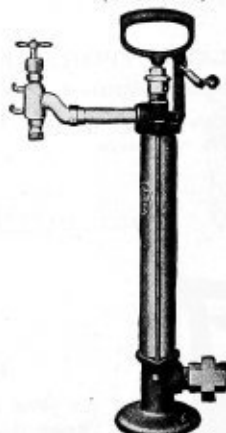


FIG 1283

CUT 16 OUTFITS

Adapted for private garage use. Discharges about a pint of gasoline at a stroke. Very easily operated. Pump is heavy and substantial, well built throughout. Can be equipped with Filter, Hose and Nozzle when required. Storage Tank of any size or capacity required. High grade outfit, moderate price. Write for complete description, prices, etc.

CUT 30 OUTFITS

Adapted for private garage use. Pump discharges a quart of gasoline on each stroke. Very easily operated. Pump is heavy and substantial, well built throughout and will give entire satisfaction. Can be equipped with Filter, Hose and Nozzle when required.

Storage Tank furnished of any size or capacity desired. This is a good Outfit at a low price.

GALVANIZED OILY WASTE CAN WITH SELF CLOSING COVERS

Nos.	1	2	3	4
Size	12x15	13x18	14x20	14x22
List	per doz. \$24.00	30.00	36.00	45.00

Nos.	5	6	7	8
Size	17x24	18x36	20x30	24x36
List	per doz. \$66.00	72.00	108.00	144.00



FIG. 1284



FIG. 1285

JUSTRITE OILY WASTE CAN WITH SELF CLOSING COVERS OPENS WITH THE FOOT

No.	1-0	2-0	3-0
Size, exclusive legs.....inches	11 $\frac{3}{4}$ x13	12 $\frac{1}{2}$ x14	13 $\frac{1}{2}$ x15
Price	per dozen \$30.00	33.00	36.00

SAFETY CORRUGATED OILY WASTE CAN

Ours are the only cans with cover opening from both sides; that have all seams riveted and soldered; that have double bottoms; that have four legs; or that have center bottom support.

The fact that our cans are corrugated makes them stronger and lighter than any other. They are the only cans that nest for shipment, protecting the goods in transit, securing lowest shipping rate—third-class instead of double first—and occupying the smallest storage space.

No. 0, 12x15, 7 gal.	Per dozen	\$33.30
No. 1, 15x17, 10 gal.	Per dozen	36.00
No. 2, 15x22, 15 gal.	Per dozen	45.00
No. 3, 15x28, 20 gal.	Per dozen	54.00
No. 4, 17x17, 15 gal.	Per dozen	45.00
No. 5, 17x22, 20 gal.	Per dozen	54.00
No. 6, 17x28, 25 gal.	Per dozen	63.00
No. 7, 20x22, 30 gal.	Per dozen	72.00
No. 8, 20x28, 35 gal.	Per dozen	81.00



FIG. 1286

STANDARD SAFETY OILY WASTE CAN

WITH FOOT OPERATED COVER



FIG. 1287

A can exceeding requirements, having the sides and body corrugated, adding largely to strength and stiffness, having a double bottom riveted to body. Extra strong legs, well riveted and Corrugated Flange Cover.

This cover is a distinct improvement over any waste can cover we have yet seen—is operated by the foot and is self closing.

It is made of heavy material greatly stiffened by a flange turned down to cover the can rim and make a better enclosure against fire.

No. F0, 12x15, 7 gal.	per dozen	\$42.30
No. F1, 15x17, 10 gal.	per dozen	45.00
No. F2, 15x22, 15 gal.	per dozen	54.00
No. F3, 15x28, 20 gal.	per dozen	63.00
No. F4, 17x17, 15 gal.	per dozen	54.00
No. F5, 17x22, 20 gal.	per dozen	63.00
No. F6, 17x28, 25 gal.	per dozen	72.00
No. F7, 20x22 30 gal.	per dozen	81.00
No. F8, 20x28 35 gal.	per dozen	90.00

CORRUGATED SAFETY BENCH

OR INDIVIDUAL WASTE CAN

Corrugated body with only one side seam, which is riveted and soldered.

Four legs, raising body of can two inches.

Self closing cover—cannot be left open.

Heavy steel wire turned in top edge.

A well made, serviceable Can, first class in every respect.

Furnished with or without partition for separating clean from soiled waste.



FIG. 1288

No.	Capacity	Diam.	Depth of Can	Price per 100
B12	.3 Gal.	10 in.	9½ in.	\$165.00
B14	.3½ Gal.	12 in.	9 in.	180.00
B16	.4 Gal.	12 in.	10 in.	195.00
B18	.4½ Gal.	12 in.	11 in.	210.00
B20	.5 Gal.	13 in.	10 in.	225.00
B22	.5½ Gal.	13 in.	11 in.	240.00
B28	.7 Gal.	15 in.	11 in.	255.00

For partition
add 10 cts.
per Can, Net

THE "BESTOVALL" GARBAGE CAN

THE BEST IS THE CHEAPEST

WE HAVE THE BEST AND THE CHEAPEST

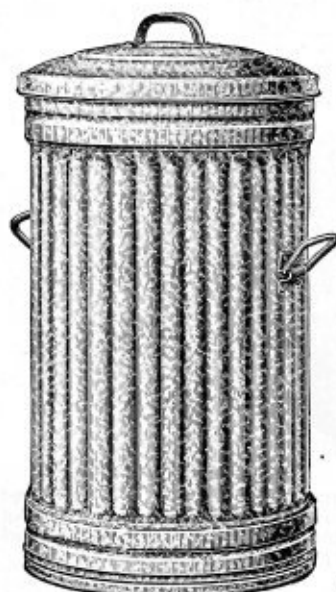


FIG. 1289

forced down on the can it fits tight and makes it dog-proof.

The "Bestovall" is entirely a new style of Corrugated Garbage Can, made of special heavy stock and very strongly made in every respect, making it the neatest, strongest and most durable can on the market.

We call your special attention to the top rim of this can, which is welded together, making a very important feature on a garbage can, as this is one of the first places where they get out of shape or broken, and by having the rim welded no matter how roughly the can is handled the top rim cannot be jammed out of shape, consequently the cover will always fit; further than this, we have a much better fitting cover than any other can on the market, as it has a wide flange and any one can place it in position without any trouble, as the flange on the cover is a trifle tapering, so that when

MADE IN THREE SIZES

No. 150.	Size 15 x 26.....	list price each, \$5.00
" 180.	" 18 x 26.....	" " " 6.00
" 210.	" 21 x 26.....	" " " 7.00



FIG. 1290

GALVANIZED GARBAGE CANS

BAILED WITH COVERS

Nos.	114	116	118	120
Gallons	4	6	8	10
Size .....inches	10½x10¾	12x12½	13x13¼	14¼x14½
List .....per doz.	\$12.50	16.10	17.90	20.70

FACTORY BASKET
CORRUGATED GALVANIZED STEEL

FIG. 1291

Bottom is Double, riveted all the way round, rivets set 1¾ in. apart and perfectly headed, and entire bottom soldered inside and out. Positively proof against dirt or dust rattling through. Body is made of one piece of metal, practically seamless, the only seam (on one side only) being riveted and soldered.

No.	Bu.	Diam. Inches	Depth Inches	Weight Lbs.	Price Doz.
	½	15	8	4¼	\$13.50
	¾	17	9½	5¼	15.75
1	1	17	11½	6	18.00
1½	1½	19	13	7	22.50
2	2	20	16	8	27.00
3	3	23	17	10	36.00
4	4	25	20	12	45.00
5	5	25	24	14	54.00
6	6	27	28	16	63.00
8	8	30	28	20	82.00
		80-lb. Coal Basket		6½	20.25

Rope or Iron Handles optional.

Wood or Iron Shoes on bottom Net Extra according to size.

For Casters attached.

1½ in. diam. wheel.	Net Extra.	Per doz. baskets.....	\$ 8.00
2 in. diam. wheel.	Net Extra.	Per doz. baskets.....	10.00
2½ in. diam. wheel.	Net Extra.	Per doz. baskets.....	12.00

WASTE PAPER CANS



FIG. 1292

ROUND

No. 0.	20 in. Diam.	24 in. High.	Per dozen \$	.....
No. 1.	17 in. Diam.	28 in. High.	Per dozen	.....
No. 2.	18 in. Diam.	28 in. High.	Per dozen	.....
No. 3.	20 in. Diam.	30 in. High.	Per dozen	.....

OVAL

No. 1.	21 in. Diam.	24 in. High.	Per dozen \$	.....
No. 2.	21 in. Diam.	28 in. High.	Per dozen	.....
No. 3.	21 in. Diam.	30 in. High.	Per dozen	.....

Well constructed with heavy hoods painted black or any color desired. Prices on application.

Flat-Bottom



FIG. 1293

FIRE PAILS
PAINTED RED OUTSIDE
FLAT BOTTOM

Quarts ...	10	12	14
Size ... in. $10\frac{1}{2}$ x $8\frac{3}{4}$	11x10	$11\frac{1}{2}$ x $10\frac{1}{2}$	
List ... doz.	\$8.00	9.00	10.00

ROUND BOTTOM
Painted Red

Quarts ...	10	12	14
Size ... in. $9\frac{3}{4}$ x $10\frac{1}{2}$	$10\frac{1}{2}$ x $10\frac{3}{4}$	11x12	
List ... doz.	\$9.00	10.00	12.00

Round-Bottom



FIG. 1294

GALVANIZED, ROUND BOTTOM

Quarts ...	10	12	14
Size ... in. $9\frac{3}{4}$ x $10\frac{1}{2}$	$10\frac{1}{2}$ x $10\frac{3}{4}$	11x12	
List ... doz.	\$8.50	9.50	11.50

CONICAL

Quarts	10	14
Size inches $13\frac{3}{4}$ x 15	$14\frac{1}{2}$ x $15\frac{1}{2}$	
List dozen	\$10.00	15.00



FIG. 1295



FIG. 1296

"FIBROTTA" INDURATED
FIRE PAILS

"LABELED"

Approved by National Board of Underwriters.

"Labeled" Fire Pails are made from Indurated Fibre Ware in one solid piece without seams or cracks. There is no metal to rust and become leaky—no staves to warp—bottom can't drop out. They last indefinitely and are always ready for use when the emergency comes. Although unusually durable, the "Labeled" Pails are light in weight.



FIG. 1297

"STANDARD" FIRE PAILS

These are the same as our "Labeled" Fire Pails but they do not carry the Underwriters' Label. Hence, we cannot guarantee that these "Standard" Fire Pails will be accepted by the Underwriters, although the size, construction and materials are the same as the "Labeled" Pails (which, of course, we are able to guarantee will be acceptable to the insurance companies because they have been examined and approved).

"Standard" Fire Pails are made in the same sizes and styles as "Labeled" Fire Pails and have exactly the same equipment.

Labeled Round Bottom Fire Pail.....	Per dozen	\$16.50
Standard Round Bottom Fire Pail.....	Per dozen	15.00
Regular Fibre Round Bottom Fire Pail.....	Per dozen	12.00

GALVANIZED WATER PAILS

PLAIN BODIES



FIG. 1298

Quarts.....	10	12	14	16
Si e.....inches	10 $\frac{1}{2}$ x8 $\frac{3}{4}$	11x10	11 $\frac{1}{2}$ x10 $\frac{1}{2}$	12 $\frac{1}{4}$ x11 $\frac{1}{4}$
List.....per dozen	\$7.50	\$8.50	\$9.50	\$12.00

HEAVY PAILS

List.....per dozen	\$10.00	\$12.00	\$14.00	\$15.00
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EXTRA HEAVY

List.....per dozen	\$12.00	\$14.00	\$16.00	\$17.00
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“FIBROTTA” INDURATED WATER PAILS
FOR RAILROAD AND
FACTORY USES

Capacity, 14 Quarts

List price per dozen \$12.50



FIG. 1299

CEMENT PAILS
GALVANIZED, EXTRA
HEAVY DOUBLE
BRACED BOTTOMS

Capacity, 14 Quarts,

Size 11 $\frac{3}{4}$ x10 $\frac{1}{2}$

List per dozen.....\$20.00

Cement Pail

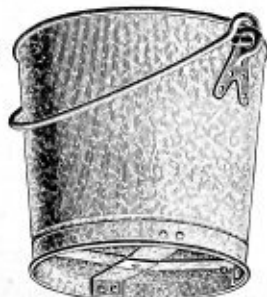


FIG. 1300

CORRUGATED STEEL WATER PAILS

GALVANIZED

Number of pail indicates capacity in
quarts



FIG. 1301

No.	SIZE		Without Cover	With Covers
	Diam.	Depth	Per Dozen	Per Dozen
12	10	9 $\frac{1}{2}$	\$ 9.00	\$12.75
14	12	9	9.75	13.50
16	12	10	10.50	14.25
18	12	11	11.25	15.00
20	13	10	12.00	16.50
22	13	11	12.75	17.25
28	15	11	13.50	19.50
19	13	9 $\frac{3}{4}$	12.00	16.50
37	16	13	15.00	22.50

EUREKA HORSE PAIL

Double bottom. Bail ear extends down the sides and hooked over bottom of stave.

Doz.
No. 1. With side strap and reinforced bottom.....\$11.00

No. 2. With side strap only. 10.00

**FIG. 1302****WOOD WELL BUCKETS**

Oak, varnished; 4 steel hoops, long strap ears; $\frac{1}{4}$ inch iron ball.

Capacity $2\frac{1}{2}$ gallons.....per doz. \$....
Capacity $3\frac{1}{2}$ gallons.....per doz.
Capacity 5 gallons.....per doz.

**FIG. 1303****RAILROAD WATER KEGS**

Oak, hinged cover, 6 steel hoops, malleable iron handles.

Cap., gals.	5	10	15	20	25	30
Price, ea.	\$3.20	4.00	5.40	6.40	7.00	7.40

**FIG. 1304****FARM OR SUGAR KETTLES**

BAILED OR UNBAILED WITH STOP LUGS WHICH PREVENT WEDGING

Very Light. Black on Outside. Nicely Milled

No. 8, 6 gal. ..ea.	\$2.30	No. 25, $20\frac{1}{2}$ gal., ea.	\$6.10
No. 10, 8 gal. ..ea.	2.70	No. 30, 27 gal., ea.	8.10
No. 12, 10 gal. ..ea.	3.20	No. 35, 30 gal., ea.	9.40
No. 15, 14 gal. ..ea.	3.80	No. 40, 35 gal., ea.	12.00
No. 20, 16 gal. ..ea.	4.90		

**FIG. 1305**

Balls, Nos. 8 to 15, 40c ex.
Balls, Nos. 20 to 40, 50c ex.

CALDRON KETTLES

No. 1. 20-gal., $22\frac{1}{2}$ " inside diam., 16" deep	each \$ 6.00
No. 2. 50-gal., $31\frac{1}{2}$ " inside diam., 19" deep	each 12.00
No. 3. 100-gal., 38" inside diam., 20" deep	each 24.00

**FIG. 1306**

EAGLE MOP WRINGERS AND BUCKETS

Domestic

Standard

Janitor's



FIG. 1307



FIG. 1308



FIG. 1309

The rollers are of maple, with steel axles; springs are oil tempered steel; treadle and portable roller shank of machine steel; rest of parts are of malleable iron.

Domestic, for home use.....	Holds 10 quarts water.....	Per dozen	\$21.00
Standard, for store use.....	Holds 14 quarts water.....	Per dozen	24.00
Janitors, for hotels, etc.....	Holds 22 quarts water.....	Per dozen	29.50

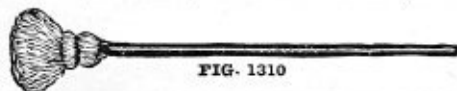


FIG. 1310

COTTON MOPS

Wood handle; 53 inches long; head securely tied to handle.

Numbers	12	14	16	18	20	22	24
Weight, head.....ounces	12	14	16	18	20	22	24
Per dozen	14	18	20	24	26	28	30
Per dozen	\$5.00	6.00	7.00	9.00	9.50	10.00	10.50

"FIBROTTA" INDURATED SPITTOONS AND MATS



FIG. 1311

ALL-FIBRE. A NEAT AND INEXPENSIVE SPITTOON AND MAT

SPITTOONS

No.....	1	2	3
Height.....in.	6½	5½	4½
Diameter.....in.	13	11	9
Price, per dozen ..	\$16.80	12.80	11.40
Extra Tops, per pair	5.80	4.70	4.40



FIG. 1312

MATS

No. 17. Diameter, 17 inches.....	Price, per dozen	\$8.80
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WHITE ENAMELED IRON CUSPIDORS

Broad top



FIG. 1313

BROAD TOP CUSPIDORS

9½ inches wide, at top, 6½ inches high.
Price, doz.....\$10.80

Sanitary



FIG. 1314

SANITARY CUSPIDORS

Large size—10¾ inches at top, 4¾ inches high.....	Per dozen	\$15.00
Small size—8 inches at top, 4 inches high.....	Per dozen	11.50

Above Cuspidors are furnished finished either in Red, Blue, Green or Maroon.

ENTERPRISE IMPROVED BUNG-HOLE BORER

(To Sharpen the Stock or Reamer, File the Inside of the Slot Only.)

**FIG. 1315**

The main advantages of this Borer are—it bores a complete round hole, regular taper, holds its own chips and prevents them from entering the cask.

- No. 1—Small size, boring from $\frac{3}{8}$ to $1\frac{1}{2}$ inches, packed 12 in a case....each, \$2.00
 No. 2—Medium size, boring from $1\frac{1}{4}$ to 2 inches (For No. 61 and 64 Faucets), packed 12 in case.....each, 2.75
 No. 3—Large size, boring from $1\frac{1}{2}$ to 3 inches (For No. 62 Faucet), packed 12 in case.....each, 3.50

STEARNS "LOCK-FAST" OIL AND MOLASSES GATES

Style A, Wood thread.

Style E, Iron pipe thread.

**FIG. 1316**

Wood thread has tapered shank. Iron pipe standard thread has straight shank. English thread furnished if ordered. Locking Gates are only furnished up to $1\frac{1}{2}$ ".

Size, inch.....	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	3
Japanned .....Per dozen	\$9.50	12.00	14.00	16.50	20.00	28.00	50.00
Tinned .....Per dozen	13.50	16.00	18.50	21.50	26.00	35.00	60.00
All Brass .....Per dozen	22.50	24.50	36.00	50.00	60.00	80.00	100.00
Porcelain Lined.Per dozen	.....	.....	.....	23.00	27.00	37.00	62.50

**FIG. 1317****"STEBBINS STYLE" OIL AND MOLASSES GATES**

Number	1	2	3	4	5
Inside dia.	13-16	$\frac{7}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$
Bore, ins.	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{8}$	$1\frac{1}{2}$
Per dozen	\$7.00	8.00	9.00	10.00	12.00

**FIG. 1318****NEW WATSON AUTOMATIC BARREL FILLER**

Stops guesswork, saves labor and never spills a drop—when barrel is filled intake is automatically closed.

List Priceeach, \$.....

NO. 560. WATER COOLER

No. 560 will accommodate a 5- or 3-gallon bottle. It has accommodations for 15 lbs. of ice. The cooler does not permit the water to come in contact with the ice at any time. The water flows from the bottle into a white semi-vitreous porcelain jar, and is drawn off through a triple plated faucet. The ice surrounds the water at all times, but never comes in contact with it. The same cooler can be supplied in a smaller size, known as style No. 160. This will accommodate a 1- or 2-gallon bottle, with an ice capacity of 7 lbs.

No. 560—Mahogany color, without bottle.....	each,	\$15.00
No. 160—Mahogany color, without bottle.....	each,	12.00
5-gallon bottles for No. 560 Cooler.....	each,	1.80
3-gallon bottles for No. 560 Cooler.....	each,	1.40
2-gallon bottles for No. 160 Cooler.....	each,	.90
1-gallon bottle for No. 160 Cooler.....	each,	.50

For Coolers in white enamel finish, add \$1.00 to list.



FIG. 1319

WATER COOLERS

Assorted Colors. Handsomely Decorated.

Self Closing Push Button Faucets. Side Handles.

Galvanized Iron Reservoir. Solid Filled Walls.



FIG. 1320

Numbers	01	02	03	04
Gallons	1½	2	3	4
Each	\$3.05	3.50	4.30	5.30
Numbers	06	08	010	014
Gallons	6	8	10	14
Each	\$6.20	8.10	9.75	13.90

We will furnish these numbers with either lever or push button faucets as ordered.

PURITAN DRINKING FOUNTAINS

No. S-501 Fountain



FIG. 1321

No. S-505 Fountain



FIG. 1322

PURITAN S-501 DRINKING FOUNTAIN

N. P. Brass; self closing push button; 4 stream "angle jet" bubbler; regulating screw; either vitreous china or spun brass 4" diameter cup; inlet $\frac{1}{2}$ " I. P. connection; outlet tapped $\frac{3}{8}$ " I. P. thread.

Price\$6.00

PURITAN S-505 DRINKING FOUNTAIN

For use over sink or in connection with porcelain or marble wall receptacle. Same as Puritan No. 1 but has self-closing push button valve on side for filling glass. Shown with 6" N. P. spun brass bowl, 4 stream "angle jet" bubbler and metal guard ring. Can be furnished with either 4" vitreous china or N. P. cup if desired.

Price\$12.00

No. S-508 Head



FIG. 1324

No. S-515 Head



FIG. 1323

PURITAN S-515 BUBBLING HEAD

With N. P. metal guard ring; 4-stream "angle jet" bubbler and volume regulator; threaded $\frac{3}{8}$ " iron pipe size.

Price\$4.50

PURITAN S-508 FOUNTAIN HEAD

With N. P. metal guard ring; 4-stream "angle jet" bubbler; self-closing level handle valve; inlet $\frac{3}{8}$ " I. P. size.

Price\$9.00

PURITAN DRINKING FOUNTAINS—CONTINUED

4 Stream "Angle Jet" Bubbler



FIG. 1325

No. S-540 Wall Type Fountain



FIG. 1326

PURITAN S-540 WALL TYPE FOUNTAIN

Black enameled heavy cast iron bracket; bowl made from polished "Brite-metal" which will not rust, corrode or chip, yet can be cleaned and polished without injury to the finish; Puritan 4-stream "angle jet" bubbler; self closing valve (any pattern) and N. P. regulator as shown. Drain tapped 1 inch I. P.

List\$16.50

No. S-545 Fountain

PURITAN S-545 PEDESTAL FOUNTAIN

Has same top and bowl as Puritan S-540; 2½" O. D. pipe standard; supply and waste pipes concealed; N. P. self-closing valve and regulator.

Height	inches	30	36
Price	each	\$21.00	\$22.00

NOTE—If connections are to be made above floor line, order Puritan S-546 Pedestal, which has open base.

No. S-548 Fountain



FIG. 1327

PURITAN S-548 VITREOUS CHINA PEDESTAL FOUNTAIN

With self closing S-508 bubbling head; concealed galvanized supply and waste pipes to floor.

Height	inches	30	36
Price	each	\$45.00	\$50.00



FIG. 1328

"BESTOVALL" CYLINDER OIL

FIG. 1329

Highest grade of cylinder oil obtainable. Will lubricate any valve or cylinder, no matter what may be the conditions. Will not clog in lubricator, requires half the amount of an ordinary cylinder oil, will save packing, as it contains no acids. We cannot recommend this oil too highly. A trial will prove its superior quality to all other cylinder oils.

Price, in barrels, per gallon.....\$0.75

"BESTOVALL" ENGINE OIL

FIG. 1330

Is a pure mineral oil, suitable for use on the finest engines and machines, is not affected by change in temperature, will not gum, and is in every other respect an A No. 1 lubricant.

Price, in barrels, per gallon.....\$0.50

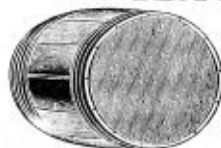
"BESTOVALL" THREAD CUTTING OIL

FIG. 1331

FOR THREAD-CUTTING, DRILLING AND MILLING TOOLS

In barrels, per gallon.....\$1.00

BOILER COMPOUND

FIG. 1332

A vegetable compound, non-injurious to metals with which it comes in contact. Will prevent scale from forming and remove that already formed.

In half barrels, per pound.....\$0.12

In barrels, per pound......10

Solid or liquid form.

SODA ASH, 58%

In bags of about 300 lbs.....Per pound, \$.....

SALT

Rock	Per barrel,
Coarse	Per barrel,
Fine	Per barrel,

PLUMBERS' CANDLES**GRADE "A"**

Plumbers' Candles are manufactured in two sizes. Five candles to the set, measuring $4\frac{7}{8}$ " long by $1\frac{16}{64}$ " in diameter, and six candles to the set, measuring $5\frac{1}{8}$ " long by $1\frac{8}{64}$ ". Full cases contain forty sets and half-cases contain twenty sets. Each set is equivalent to one pound. Half cases cost one-half cent per set over the price of full cases.

GRADE "C"

Grade "C" Candles are the same size and packed in like manner to grade "A." They are made of harder stock and are better suited for tinning and soldering purposes.



FIG. 1333

SMOOTH-ON IRON CEMENTS NO. 1 AND NO. 2 IN BLUE LABELED CANS

No. 1 is quick hardening. No. 2 is slow hardening and hydraulic.

These cements are chemical iron cements, prepared and sold in powder form, for repairing leaks or breaks in castings and for making connections in steam or hydraulic work. They withstand fire, water, steam or oil and very high pressures. No. 1 quick hardening. No. 2 slow hardening and hydraulic. Applied as a paste or putty. Must be applied to cold metal. Expansion and contraction when hard, the same as cast iron.

SMOOTH-ON ELASTIC CEMENT NO. 3 IN GREY LABELED CANS

This is an iron cement, prepared and sold in paste form for use on all seams of boilers or tanks, to stop leaks, also for boiler patching and for screw-thread joints. Also for repairing very fine cracks. This cement is hardened by heat. Applied as a paint, paste or putty. May be applied to hot or cold metal. Expansion and contraction when hard, the same as cast iron.

SMOOTH-ON CASTINGS NO. 4 IN YELLOW LABELED CANS

This is a chemical iron cement for repairing blemishes, blowholes or defects in iron or steel castings, having the same color and appearance. Made in two grades. Prepared and sold in powder form. Used by foundrymen. Applied as a putty.

SMOOTH-ON JOINTS NO. 5 IN RED LABELED CANS

This is an iron caulking cement for bell and spigot cast-iron soil and greenhouse pipes, used in place of caulking lead and in combination with lead.

SMOOTH-ON RIVET IRON CEMENT NO. 6

IN WHITE LABELED CANS
For bridge and ship work

This is a metallic cement for making water tight joints on ships' sides, iron steel or wood. Bridge work, construction work, metal skylights and vault lights. Withstands temperature changes and salt water. Prepared and sold in putty form.

SMOOTH-ON IRON CEMENT NO. 7

An iron cement prepared in powder form, used in combination with Portland cement, for stopping leaks in concrete, brick and stone work and for waterproofing.

Price, Smooth-on Iron Cement Nos. 1 and 2 in 1, 5, 10 and 25-lb. tins	per lb.,	\$0.50
Price, Smooth-on Elastic Cement in 1, 5 and 10-lb. tins	per lb.,	.50
Price, Smooth-on Joints in 1, 5, 10 and 25-lb. tins	per lb.,	.50
Price, Smooth-on Castings Grade A and B in 1, 5, 10 and 25-lb. tins	per lb.,	.50
Price, Smooth-on Rivet Iron Cement in 1, 5 and 10-lb. cans	per lb.,	.50
Price, Smooth-on Iron Cement No. 7 in 5, 10, 25, 50 and 100-lb. tins	per lb.,	.50

DIXON'S SPECIAL GRAPHITE No. 635



FIG. 1334

This is a special grade of Dixon's pure flake graphite, selected with great care and ground to an impalpable degree of fineness. Dixon's Special Graphite is widely used upon locomotive air brake mechanisms, typesetting machinery, light close fitting bearings, spindles, bobbins and other delicate parts of textile machinery.

1-lb. cans	each	.75
5-lb. cans	each	3.25
10-lb. cans	each	6.50
25-lb. boxes	per lb.	.60
50-lb. boxes	per lb.	.60
100-lb. kegs	per lb.	.60
200-lb. barrel	per lb.	.60

DIXON'S PLUMBAGO OR GRAPHITE

FOR LUBRICATING PURPOSES

No.			
632	1-lb. cans, 36 in case.....	per pkg.	\$0.40
633	5-lb. can, screw top, 10 in case.....	per pkg.	1.75
634	10-lb. cans, screw top, 5 in case.....	per pkg.	3.25
644	25-lb. box		7.50
645	50-lb. box		14.00
646	100-lb. keg	per lb.	.27
646½	200-lb. half barrel.....	per lb.	.26
647	400-lb. barrel	per lb.	.25



FIG. 1335

DIXON'S GRAPHITE PIPE JOINT COMPOUND



FIG. 1336

Dixon's Graphite Compound is not a cement which hardens, but rather a true lubricant for the thread of pipes, bolts, nuts, turn-buckles, lag screws, etc., making them easy to screw up and allowing them to be taken apart without damage or trouble.

No. 693	1-lb. tin can	per lb.	\$0.35
No. 694	5-lb. tin can	per lb.	.30
No. 695	10-lb. tin can	per lb.	.28
No. 696	25-lb. tin can	per lb.	.26
No. 697	50-lb. keg	per lb.	.24
No. 698	100-lb. keg	per lb.	.23
No. 699	Barrel, 625 lbs.....	per lb.	.22

HUNZEKER'S PIPE CEMENT

HUNZEKER'S NO. 1 CEMENT is a heavy red liquid. For making up threaded joints on steam, super-heated steam, hot and cold water, ammonia, brine, air, gas and oil pipes.

Apply this compound to all pipe threads, before making up the joint. A tight joint is insured by the cement closing up many small defects in the pipe, castings and threads, and its elastic properties permit it to expand and contract with the metal.

Corrugated Copper Gaskets coated with Hunzeker's Cement make the best possible joints where flanges are used, no sheet gaskets are necessary when it is used.



FIG. 1337

This cement will not waste or dry up in the can, and is thus very economical to use. It is mixed ready for use. It sets up on the joint to a certain extent, but the pipe may be unscrewed with comparative ease.

Acts as a lubricant while pipe is being screwed up. Takes very little for a joint. It is cheaper and better than red or white lead. Not an experiment.

1 pound can	per pound	\$0.20	No. of cans to case.....	36
5 pound bucket	per pound	.18	No. of cans to case.....	12
10 pound bucket	per pound	.16	No. of cans to case.....	6
25 pound bucket	per pound	.15½	No. of cans to case.....	2
50 pound can	per pound	.15	No. of cans to case.....	1
125 pound can	per pound	.14½	No. of cans to case.....	..
350 pound can	per pound	.14	No. of cans to case.....	..

HUNZEKER'S NO. 2 CEMENT. A heavy, black liquid, specially made for gas lines. This elastic compound is specially made for application on joint of natural and artificial gas pipe lines. In case of threaded joints apply coating of Hunzeker's Cement to threads before screwing up joint. Where patented clamp connections are used, apply cement to the gasket before it is put in place.

It will not dry up and waste in the can. Sets up partially on joint, but pipe may be easily taken apart. It preserves the metal. It's elastic. The Ohio Fuel Supply Co. (and subsidiaries) have used this cement for over 20 years.

This Cement is also good on Air, Cold Water, and Vent lines.

½ gallon bucket	per gallon	\$1.16	No. of cans to case.....	12
1 gallon bucket	per gallon	1.13	No. of cans to case.....	6
5 gallon jacket can	per gallon	1.10	No. of cans to case.....	1
10 gallon jacket can	per gallon	1.05	No. of cans to case.....	1
½ barrel, about 30 gal.	per gallon	1.00	No. of cans to case.....	1
1 barrel, about 52 gal.	per gallon	.95	No. of cans to case.....	1

U. S. G. CO.'S No. 205 LUBRICATING GRAPHITE



FIG. 1338

An air-floated POWDER of impalpable fineness, pure, soft, peculiarly adhesive and absolutely gritless. No. 205 Graphite is very superior for lubricating purposes to the coarser grained and less finely pulverized graphite of the "flake" variety.

A sure preventive and cure for hot pins, hot boxes, groaning cylinders, etc., and especially efficient in gas engine cylinders where, besides minimizing carbonization, it assures better compression, and more power with less gasoline.

Judiciously used will reduce oil and grease consumption at least one-fourth and in many cases one-third. Mix with oil in the proportion of about one teaspoonful to the pint; with greases use about one ounce (or say two teaspoonfuls) to the pound. Always mix thoroughly. The DRY POWDER may be introduced within gas engine cylinders by holding a small quantity (say one-half teaspoonful) at the cold-air intake of carburetor while engine is in motion. It may also be mixed with oil to proper consistency and used as a preservative paint

for smoke-stacks, boiler fronts, etc., or as a joint compound for pipes and gaskets.

½ lb. Screw Top Cans (36 in case).....	per can	\$0.30
1 lb. Screw Top Cans (36 in case).....	per can	.40
5 lb. Screw Top Cans (12 in case).....	per can	1.90
10 lb. Screw Top Cans (6 in case).....	per can	3.50
25 lb. Screw Top Cans (2 in case).....	per can	8.00
100 lb. Kegs	per lb.	.30
Barrels (about 350 lbs.).....	per lb.	.28

U. S. G. CO.'S MEXICAN GRAPHITE PIPE CEMENT

Used by engineers, plumbers, gas and steam fitters for dry or steam pipe joints, gaskets, man and hand hole plates, stay bolts, etc.

A compound suited to all kinds of joints, threaded or flanged, having for its base pure Mexican Graphite, which is wholly unaffected by water, heat, cold or chemical action of any nature. Connections on which it is used can be easily detached at any time without the slightest injury to threads or tools, for, unlike red lead, it never "sets hard." Prevents rust and assures an absolutely air and water tight joint.

1 lb. Friction-Top Tin Cans (36 cans in case) ..	per can	\$0.27
5 lb. Friction-Top Tin Pails (20 pails in case) ..	per lb.	.25
12½ lb. Tin Pails (8 pails in case).....	per lb.	.23
25 lb. Tin Pails (4 pails in case).....	per lb.	.22
100 lb. Tin Cans (1 can in case).....	per lb.	.21
½ Barrels, about 350 lbs.....	per lb.	.19
Barrels, about 600 lbs.....	per lb.	.18



FIG. 1339

ARCTIC CUP GREASE

In Cans



FIG. 1340

In Barrels



FIG. 1341

A lubricant adapted for general use on crank pins, shafting, loose pulleys, valve motions, eccentrics, slides, main journals, etc.

Made in different consistencies to meet all requirements.

No. 1—This grade is the softest and suitable for rapid-running machinery, or machinery so constructed that the parts must be lubricated by means of a tube or common squirt can.

No. 2—A little harder in consistency than No. 1. Adapted for general use on crank pins, cross heads, valve motions, eccentrics, slides, pillow blocks and main journals where a spring or compression cup is used; can also be used on open bearings where aperture is small.

No. 3—A little harder in consistency than No. 2. Suitable for use in screw cups; can be used in compression cup having extra strong spring; or in open bearings where aperture is moderately large.

No. 4 and 5—Suitable for open bearings, where a high-melting point or stiff lubricant is required.

Nos.	0-1-2-3	4-5
1 50-lb. lithographed tin	\$21.00	\$23.00
1 25-lb. lithographed tin	23.00	25.00
1 10-lb. lithographed tin	24.00	26.00
Barrels	15.00	17.00
Half-barrels	15.50	17.50

ALBANY CUP GREASE



FIG. 1342

Albany grease is a pure lubricant, does not drip, splash or waste away; self-acting, runs only while shaft is in motion. Impossible for bearings to become overheated. No drip pans required; once tried you will use no other.

Albany grease will feed perfectly through any grease cup, and is made in seven regular numbers; their application and approximate melting points are such that the user can judge what number is best adapted to his work under various conditions.

No. 0. A soft grease for use on machinery out of doors in extreme cold weather.

No. 1. A medium grease for slow running journals in cold weather.

No. 2. For use on bearings in moderate and warm weather.

No. 3. A summer grease for universal use.

No. X. A heavy bodied grease for bearings heavily loaded.

No. XX. Has a high melting point.

No. XXX. For unusual conditions—having a high melting point.

In cans, containing 1 lb.....	list price, per lb.	\$0.35
In cans, containing 5 and 10 lbs.....	list price, per lb.	.30
In cans, containing 25 lbs.	list price, per lb.	.28
In cans, containing 50 lbs.....	list price, per lb.	.28
In kegs, containing about 125 lbs.....	list price, per lb.	.18
In half barrels, containing about 200 lbs.....	list price, per lb.	.17
In barrels, containing about 400 lbs.....	list price, per lb.	.16

COOK'S LUBRICANT

The transmission, differential and timing gears of an automobile, reverse gears of motor boats, worm gears of passenger and freight elevators, spindle gears of milling machines, all may be lubricated with Cook's Lubricant efficiently and economically.

Cook's Lubricant will not run or leak out of the gear case, as will oil. It cannot be thrown off the gears by centrifugal force as will grease and it is not affected by temperature changes. There is at least 10 per cent to 20 per cent less in poundage of Cook's Lubricant required per gear case than any other lubricant. It has long life and gives high mileage. It not only lubricates the gears but protects them. Cook's lubricant is made in three consistencies, soft, medium and hard. For the average gear case the medium consistency is recommended.



FIG. 1343

In cans containing 1 lb.....	per lb.	\$0.30
In cans containing 5-10-25-50 lbs.....	per lb.	.25
In kegs containing about 125 lbs.....	per lb.	.14
In half-barrels containing about 200 lbs.....	per lb.	.13
In barrels containing about 400 lbs.....	per lb.	.12

U. S. G. CO.'S MEXICAN GRAPHITE CUP GREASE

MADE IN FOUR CONSISTENCIES ADAPTED FOR ANY PURPOSE
WHERE A HIGH-GRADE GREASE IS DESIRABLE



FIG. 1344

This Cup Grease is composed only of the finest mineral lubricating oils, compounded with the correct proportion of powdered amorphous Mexican graphite, air-floated and made impalpably fine. It contains no animal matter, acids, resin or other injurious ingredients, and is therefore absolutely neutral and can in no way corrode or otherwise injure bearings.

EXTRA SOFT—Suited to very rapid running machinery or machinery so constructed that the parts to be lubricated must be reached by means of a tube or common squirt can. The extra soft consistency makes an excellent lubricant for transmissions and sliding gears, when same are enclosed in a case.

SOFT—Well adapted for use on crank-pins, cross-heads, valve motions, eccentrics, slides, pillow-blocks, main journals, etc.

MEDIUM AND HARD—Used generally where stiff cup grease is desired.

Unless otherwise specified, medium consistency is always shipped, as this is adapted for use in screw cups or in compression cups having extra strong spring. It can also be used on open bearings where aperture is moderately large.

U. S. G. CO.'S MEXICAN GRAPHITE JOURNAL AND GEAR GREASE

MADE IN THREE CONSISTENCIES—HARD, MEDIUM AND SOFT
FOR THE LUBRICATION OF JOURNALS, GEARS, ETC.



FIG. 1345

Compounded from suitable mineral lubricating oils and contains just the right proportion of AIR FLOATED LUBRICATING GRAPHITE. Does not gum, harden or dry up. Unaffected by heat or cold and therefore usable in any climate.

All above greases are packaged and sold as follows:

5 lb. Friction-Top Tin Pails (12 pails in case)	per pail	\$1.05
10 lb. Friction-Top Tin Pails (6 pails in case)	per pail	1.80
25 lb. Tin Cans (2 cans in case)	per can	3.75
Kegs, about 140 lbs.	per lb.	.13
One-half barrels, about 250 lbs.	per lb.	.12½
Barrels, about 450 lbs.	per lb.	.12

U. S. G. CO.'S MEXICAN BOILER GRAPHITE



FIG. 1346

U. S. G. CO.'S MEXICAN BOILER GRAPHITE is a very pure and very finely powdered graphite which when introduced with the feed water circulates through the boiler and attacks, softens and so disintegrates old scale that it may be easily removed. It then imparts to the steel of the boiler a graphitic finish or polish on which scale will not readily form, but if it does thereafter appear MEXICAN BOILER GRAPHITE forms in and with that scale, making it soft and easily cleaned out, in short MAKES BOILER CLEANING EASY.

It does all this without harm to the boiler itself, in fact acting MECHANICALLY—not chemically—there is no possible manner in which it could attack the steel of a boiler. On the other hand, boiler "compounds" of sufficient chemical strength to be efficient are unsafe because, naturally, such chemicals will likewise attack and "pit" tubes and shell, for only very powerful chemicals will work effectively on old, hard scale. Obviously then, there is a great advantage in using a boiler scale remedy which acts in a manner gently mechanical rather than chemically severe.

And for this reason, that is because it acts mechanically, U. S. G. CO.'S MEXICAN BOILER GRAPHITE is effective in any feed water regardless of its character (saving the trouble and expense of frequent analyses) and again for the same reason it can by no possibility be the cause of "foaming," nor under normal conditions can it pass from a boiler with the steam and thereby render it unfit for industrial purposes. The cost of using it is about one-third of the usual cost for compounds that do not always work.

100 lb. Kegs	per net pound	\$0.14
Barrels (about 350 lbs.)	per net pound	.10

U. S. G. CO.'S MEXICAN GRAPHITE CABLE GREASE

Mexican Graphite has a natural affinity to metals and after a short period of continuous application the graphite contained in this dressing will impart to wire ropes or cables a smooth, slippery, water-proof surface, thereby accomplishing a very appreciable saving in power, noticeably reducing wear and absolutely preventing "cutting" or corrosion.

May be applied by means of "swab" or otherwise. Adhesive in the highest degree, it is not removed by rain or running water—it "STAYS PUT"—so its use minimizes the cost of properly lubricating and caring for wire ropes and cables.



FIG. 1347

5 lb. Friction-Top Tin Pails (12 in case).....	per pail	\$1.05
10 lb. Friction-Top Tin Pails (6 in case).....	per pail	1.80
25 lb. Tin Cans (2 cans in case).....	per can	3.75
Kegs about 140 lbs.....	per lb.	.13
One-half barrels, about 250 lbs.....	per lb.	.12½
Barrels, about 450 lbs.....	per lb.	.12

U. S. G. CO.'S MEXICAN GRAPHITE CAR GREASE

Graphite of the right sort is the best known friction-preventing and friction-reducing agent. Instead of merely providing a cooling bath for the bearings to run in as do oils and ordinary greases, it fills in the minute irregularities that exist in all bearings and leaves a thin, smooth, mirror-like film of graphite that is almost frictionless.

This grease is compounded from the best mineral oil and our powdered, amorphous lubricating graphite. It is for use in mine cars having plain bearings and is of a consistency that permits it to be introduced with a common grease gun.



FIG. 1349

It is superior to other greases and oils, as it is not affected by changes in temperature and will not gum, harden, dry up or drip. It outlasts straight oil and is a much more effective and lasting lubricant. Bearings never become hot or scored with this grease and require a great deal less labor attention than other lubricants to keep the equipment at maximum efficiency and to prevent delay and expense caused by undue wear and tear.

Kegs (about 140 lbs.).....	per pound	\$0.10
One-half barrels (about 250 lbs.).....	per pound	.09½
Barrels (about 400 lbs.).....	per pound	.09

U. S. G. CO.'S SPECIAL ROLLER BEARING GREASE



FIG. 1349

A grease prepared especially for use in roller or ball bearing type of mine cars. Compounded from the finest mineral oil and Natural Mexican Amorphous Graphite—a pure gritless, air-floated powder, ground so fine that it fills the microscopic interstices in bearing surfaces and besides being a splendid lubricant itself it holds the oil to the bearing at the point where it is most needed. Will furnish better lubrication for a longer period of time and with less attention than any other grease sold for this purpose.

Kegs (about 125 lbs.).....	per pound	\$0.20
One-half barrels (about 200 lbs.).....	per pound	.19
Barrels (about 400 lbs.).....	per pound	.18

U. S. G. CO.'S NO. 500 MACHINERY LUBRICANT



FIG. 1350

FOR HEAVY MILL AND MINE MACHINERY

A peculiarly adhesive grease of heavy consistency carrying a large percentage of AIR-FLOATED LUBRICATING GRAPHITE which renders it especially efficient for use on cog and sprocket wheels, sprocket chains, transmission cables, wire ropes, hydraulic water pumps, gears—especially heavy gears, conveyors, roll-necks, elevator slides, etc., etc.

Packaged and sold as follows:

5 lb. friction top tin pails, 12 pails in case.....	per pail	\$1.05
10 lb. friction top tin pails, 6 pails in case.....	per pail	1.80
25 lb. tin cans, 2 cans in case.....	per can	3.75
Kegs, about 140 lbs.....	per lb.	.13
One-half barrels, about 250 lbs.....	per lb.	.12½
Barrels, about 450 lbs.....	per lb.	.12

U. S. G. CO.'S MEXICAN GRAPHITE PAINT



FIG. 1351

Made from pure Air-Floated Mexican Graphite, ground in linseed oil of the best quality, this paint is unaffected by smoke, water, brine, acids, alkali, extreme temperatures, steam, moisture, sulphur fumes, or, in fact, by any chemical or climatic condition.

The result is a paint unequaled for durability—a paint that, owing to its large covering power and reasonable price, costs less than other good paints—just the thing for structural iron and steel, steam pipes, coils, roofs, smoke stacks, boiler fronts, gas holders, vessels, fences, freight cars water tanks, bridges, grain elevators, trolley poles, etc., etc.

The covering power per gallon is approximately 1,000 square feet of smooth or new metal surfaces, 750 square feet on rough, scaly or rusty metal surfaces and 400 square feet on dressed lumber or old painted wood.

READY FOR USE

	Bbls.	Half bbls.	5-gal. cans	1 gal.	½ gal.
Color A (Natural)	\$2.90	3.00	3.15	3.25	3.40
Color B (Dark Green)	3.40	3.50	3.60	3.70	3.85
Color C (Jet Black)	3.50	3.60	3.70	3.80	3.95
Color D (Dark Brown)	3.05	3.15	3.25	3.35	3.50
Color E (Red)	3.15	3.25	3.35	3.45	3.60

PASTE FORM

	Bbls.	Half Bbls.	Kegs	25-lb. Pails	12½-lb. Pails	5-lb. Pails
Color A (Natural)	\$0.21	.21½	.22	.23	.23½	.24
Color B (Dark Green)	.28	.28½	.29	.30	.30½	.31
Color C (Jet Black)	.28	.28½	.29	.30	.30½	.31
Color D (Dark Brown)	.22	.22½	.23	.24	.24½	.25
Color E (Red)	.26	.26½	.27	.28	.28½	.29

HIGHLAND, NON-CORROSIVE COATINGS



Reg. U. S. Pat. Off.

FIG. 1352

HIGHLAND NON-CORROSIVE COATING No. 1

Is used for general structural iron and steel coating, and on surfaces coming in contact with daylight, such as: Roundhouses, train-sheds, bridges and viaducts, superstructures and roofs of smelteries, rolling mills, iron and coal mines, tipples, cages, fans, cars, concrete supports, the outside of tanks and condensers, etc.

HIGHLAND NON-CORROSIVE COATING No. 2

Is used in preserving pipe lines (both inside and out), pump discharge lines, for inside coating of silos and of tanks containing acids or liquids of any kind (be they of steel or cement construction) and for all underground work; also for electrical insulation.

Both of the above grades are sold on the guarantee that the Highland Chemical Products Company forfeits payment if results are not entirely satisfactory.

HIGHLAND STRUCTURAL COATING

Is used for painting structural iron and steel similar to Highland Non-Corrosive Coating No. 1, where the higher priced coating is not justified, and where corrosive and abrasive agents are less active.



"BLACK MAMMY" PAINTS, ETC.



ROOF PAINT

For Tin, Sheet, Iron and Steel. Especially adapted for manufacturing plants, furnaces, mines and other plants where extreme conditions exist. It will prevent rust and positively stop corrosion on any surface if properly covered.

Barrels	per gallon	\$0.90
Half barrels	per gallon	.95
5-gal. cans	per gallon	1.00



"KOMPO" ROOF PAINT

For Felt, Canvas, Wood and all Composition Roofs, Kompo Roof Paint is a perfect waterproofing, very penetrating and of a sufficient density to fill all pores of the surface, creating a perfectly smooth paint film impervious to water and moisture. It will waterproof and preserve soft surface roofs perfectly, and prolong their usefulness.

Barrels	per gallon	\$0.75
Half barrels	per gallon	.80
5-gal. cans	per gallon	.85



WOOD PRESERVER

For Poles, Cross Arms, Posts, Railroad Cross Ties, Mine, Timbers, Wood Tip-
ples, etc. This is specially prepared material, composed of a large percentage of
creosote with heavier materials, which gives it penetrating qualities, and acts as a
filler, closing the pores of the wood and excluding moisture. Ready for use; no
heating required.

Barrels	per gallon	\$1.20
Half barrels	per gallon	1.25
5-gal. cans	per gallon	1.30



BRIDGE SPECIAL

For Bridges, Structural Steel and Iron. This paint will perfectly protect
against the action of SALT BRINE originating from refrigerator cars, sulphurous
fumes and steam from locomotives. One coat properly applied gives 6 to 10 years
perfect service.

Barrels	per gallon	\$1.95
Half barrels	per gallon	2.00
5-gal. cans	per gallon	2.10

"BLACK MAMMY" PAINTS, ETC.—CONTINUED

 GALVANITE

For the protection of galvanized iron and zinc surface. Under time service test covering a period of ten years, GALVANITE PAINT shows a perfect film and no indications of loosening from the metal.

Apply with brush, one coat, without primer, at a temperature not under 60 degrees.

Barrels	per gallon	\$2.25
Half barrels	per gallon	2.30
5-gal. cans	per gallon	2.40

 STACK-END

For locomotive front-ends, stacks, boilers, hot blast stoves, etc. This paint meets all requirements for hot surface protection and is especially adapted for LOCOMOTIVE FRONT ENDS, because it is a fire resistant, not affected by steam, sulphurous vapors or water overflow, and does not burn flat, but retains its lustre, and the further fact that it has no odor to annoy the enginemen.

Barrels	per gallon	\$1.80
Half barrels	per gallon	1.85
5-gal. cans	per gallon	1.95

 PIPE KOTE

For piping in mines, gas, oil and water mains and metal culverts. This is a perfect protective coating, impervious to moisture and the action of sulphur, alkali, sewer gas, electricity and other destructive agents to which all underground metal surface is subjected constantly.

As a protective for piping in mines, gas and oil lines and metal culverts this paint is invaluable, and we heartily recommend its use.

Barrels	per gallon	\$1.35
Half barrels	per gallon	1.40
5-gal. cans	per gallon	1.50

 TANKOTE

For water tanks, stand pipes, gas tanks, etc. This paint has all the qualities for the proper protection of both metal and wood tanks under all conditions of service.

Barrels	per gallon	\$1.50
Half barrels	per gallon	1.55
5-gal. cans	per gallon	1.65

 KONKRETE KOTE

For waterproofing and dustproofing concrete surface. This is not a decorative paint, but is made for the purpose of waterproofing concrete roofs, walls and basements, and dustproofing cement floors.

Barrels	per gallon	\$1.65
Half barrels	per gallon	1.70
5-gal. cans	per gallon	1.80

PAINTS

NEW ERA PAINT-ACME QUALITY

The highest grade exterior paint possible to be made. Can be used for interior by thinning with turpentine and linseed oil. One gallon will cover 350 square feet or better, two coats to the gallon. Thirty-two shades.

List Prices per Package

	Gals.	1/2-Gals.	Qts.	Pts.	1/2-Pts.
Regular Shades	\$4.00	\$2.10	\$1.15	\$0.65	\$0.38
Outside White, Inside White, Master Painters' White.....	4.25	2.25	1.20	.67	.40
Interior Flat White, Nos. 127, 134 and 139	4.50	2.40	1.25	.70	.42
Interior High Gloss White Nos. 38 and 131	5.00	2.60	1.40	.80	.50

Barrels, half-barrels and five gallon cans, 5 cents per gallon less than gallon cans.



FIG. 1353

BOSTON PREPARED PAINT-ACME QUALITY

A high grade exterior paint. Thirty-two shades. Can also be used for interior woodwork. One gallon Boston Prepared Paint will cover 250 to 300 square feet, two coats to the gallon.

	Gals.	1/2-Gals.	Qts.	Pts.	1/2-Pts.
Regular Shades and White.....	\$3.75	\$1.95	\$1.05	\$0.60	\$0.35
Nos. 226, 227	4.15	2.15	1.20	.65	.38
No. 220	4.40	2.35	1.25	.70	.40

Barrels, half-barrels and five-gallon cans, 5 cents per gallon less than gallon cans.



FIG. 1354

ACME QUALITY NO-LUSTRE FINISH

A hard, durable, flat (lustreless) finish for decorating walls, ceilings, woodwork, fibre board, burlap, canvas and interior surfaces generally.

No. 55, Light Buff; No. 53, Light Yellow; No. 64, Pink; No. 59, Pea Green; No. 57, Blue Tint; No. 60, Old Rose; No. 22, Light Brown; No. 26, Bright Yellow; No. 28, Green; No. 65, Deep Buff; No. 66, Silver Gray; No. 67, Light Tan; No. 68, Ivory; No. 69, Olive Green; No. 70, Light Green; No. 71, Delft Blue; No. 72, Deep Tan and White.

	Gals.	1/2-gals.	Qts.	Pts.	1/2-pts.
Above Shades	\$3.75	\$1.95	\$1.05	\$0.60	\$0.35
No. 25, Rich Red	4.00	2.10	1.15	.65	.38
Primer	3.50	1.80	.95	.50	.30



FIG. 1355

ACME QUALITY GRANITE FLOOR PAINTS

For painting interior floors, steps and all similar surfaces.

List Prices Per Package

Golden Yellow, Light Red, Drab, French Yellow, Gray, Deep Red, Deep Yellow, Light Brown, Lead Color, Green, Light Lead Color, Dougall Brown, Dark Oak and Coffee Brown

Gals	1/2-gals.	Qts.	Pts.
\$3.50	\$1.80	\$0.95	\$0.50

Border Red

Gals	1/2-gals.	Qts.	Pts.
\$3.75	\$1.95	\$1.05	\$0.60



FIG. 1356

PAINTS—CONTINUED



FIG. 1357



FIG. 1358

ACME QUALITY BARN RED

For barns, roofs, fences, sheds, etc. Barn Red and Deep Barn Red—gallon, \$2.25; ½-gallon, \$1.20; quarts, \$0.65.

Barrels, half barrels and 5-gallon cans, 5 cents per gallon less than gallon cans.

ACME QUALITY MOSS GREEN ROOF PAINT

A handsome and durable green paint for shingle roofs of residences, preserving the shingles and protecting them from water and weather.

Gallons, \$3.00; ½-gallons, \$1.55; quarts, \$0.85.



FIG. 1359



FIG. 1360

ACME QUALITY BARN AND ROOF SLATE COLOR

For barns, garages, sheds, roofs, fences, etc. Gallons, \$2.75; ½-gallons, \$1.45; quarts, \$0.75.

Barrels, half barrels and 5-gallon cans, 5 cents per gallon less than gallon cans.

ACME QUALITY CEMENT COATER

Designed and perfectly adapted for coating all kinds of inside cement or concrete surfaces such as floors of power houses, bank and office vaults, garages basements, kitchens, cells, etc.

Ivory White, Terra Cotta, Cement, Color Dust Drab, Green and Flat White.

Gallons, \$3.50; ½-gallons, \$1.80; quarts, \$0.95.

ACME QUALITY EXTERIOR CEMENT FINISH

For use on exterior cement or concrete walls, veranda floors, steps, etc. Gives a soft toned, artistic finish that effectively resists the penetration of water and moisture. Recommended for use on all exterior surfaces of cement, concrete or stucco.

White, Light Gray, Dark Gray, Lead Color, Slate Color, Cream.

Gallons, \$4.00; ½-gallons, \$2.10; quarts, \$1.15.

Barrels, half-barrels and five-gallon cans, 5 cents per gallon less than gallon cans.

PAINTS—CONTINUED



FIG. 1361

These paints are packed regularly in cases containing 4 twenty-five-pound tins or twelve-and-one-half pound tins.



FIG. 1362

ACME QUALITY VENETIAN OXIDE, IN OIL

In kegs, 25-lb. tins, 12½-lb. tins. Price.....\$.....

X VENETIAN RED, IN OIL

In kegs, 25-lb. tins, 12½-lb. tins. Price.....\$.....



FIG. 1363

X YELLOW OCHRE

For Priming—In Oil

Kegs\$.....
25-lb. Tins\$.....
12½-lb. Tins.....\$.....

Packed regularly in cases containing 4 twenty-five-pound tins or 4 twelve-and-one-half-pound tins.



FIG. 1364

ACME QUALITY LIQUID RED LEAD

Acme Quality Liquid Red Lead is ready mixed to the proper consistency for use on steel or iron and is especially adapted for use as a first-coater on structural steel work.

1-gallon cans, list prices per gallon.....\$4.00

Barrels, half-barrels and five-gallon cans, 5 cents per gallon less than gallon cans.

ACME QUALITY COLD WATER PAINT

An excellent white paint finished in powder form and prepared for immediate use by the addition of water. It is recommended for hospitals, dairies, stables, poultry sheds, fences, warehouses and similar surfaces whether of brick, stone, cement or wood. It is sanitary, fire-proof and very durable.

The covering capacity will vary according to the surface. For instance one pound will cover, on smooth boards, from 50 to 75 square feet; on brick, stone and rough boards, from 20 to 50 square feet.

	Bbls., 400-lbs.	½-bbls., 250-lbs.	¼-bbls., 100-lbs.
Exterior White .....per 100 lbs.	\$12.00	\$12.50	\$13.00
Interior White .....per 100 lbs.	10.00	10.50	11.00

PAINTS—CONTINUED **ACME QUALITY MASTER PAINTERS' COLORS**

Ground in Oil

Our Master Painters' Colors (Acme Quality) are strictly pure and will meet the approval of the most critical consumer.

The utmost care is observed in their production and we offer them with a positive assurance as to their uniform excellence in every particular.

The natural pigments used are the purest, strongest and finest obtainable, and the chemical colors are all of our own manufacture. We can, therefore, not only save our dealers the middleman's profits, but are enabled to give them goods the purity of which we can vouch for ourselves.

It is impossible to produce a line of colors of greater desirability or value as regards purity and strength, fineness of texture, brilliancy and clearness of tone.



FIG 1365

List Prices per Pound

BLACKS

	25-lb. Pails	12 1/2-lb. Pails	5-lb. Cans	1-lb. Cans
Ivory Drop Black.....	\$0.65	\$0.65 1/2	\$0.70	\$0.70
English Coach Black.....				.70
Sign Writer's or Lettering Black.....				.95
Refined Lamp Black.....		.96 1/2	.98	.98

BLUES

Cobalt Blue Shade.....				\$1.25
Prussian Blue Shade.....				1.90
Ultramarine Blue.....				1.10
Also put up in 1/2 and 1/4-lb. cans at an advance of 4c and 9c per lb., respectively.				

BROWNS

Umber, Raw, Turkey.....	\$0.64	\$0.64 1/2	\$0.66	\$0.66
Umber, Burnt, Turkey.....	.64	.64 1/2	.66	.66
Sienna, Raw, Italian.....	.67	.67 1/2	.69	.69
Sienna, Burnt, Italian.....	.67	.67 1/2	.69	.69
Vandyke Brown Color.....			.84	.84

GREENS

Chrome Green—Standard Strength, Medium.....	\$0.63	\$0.63 1/2	\$0.65	\$0.65
Chrome Green—Standard Strength, Light and Deep (Of standard strength, containing 25 per cent of actual color).....			.65	.65
Chrome Green—"Double Strength," Light, Medium and Deep.....				.90
(Of double strength, containing 50 per cent of actual color).....				
Chrome Green, chemically pure—Medium.....				1.40
(Pure Green, containing 100 per cent of actual color).....				

REDS

Tuscan Red, Light.....	\$0.68	\$0.68 1/2	\$0.70	\$0.70
Tuscan Red, Deep.....	.88	.88 1/2	.90	.90
Indian Red.....			.43	.56
Venetian Red.....			.43	.43
Rose Pink.....				.95
Rose Lake.....				1.20
Turkey Red (Lake).....				1.30
Carmin Red (Carmin Substitute).....			1.20	1.20

VERMILION REDS

True American Vermilion (Chrome Red).....				\$0.80
*English Vermilion.....				4.50
*Also put up in 1/2-lb. cans at an advance of 4c per pound.				

YELLOW

Chrome Yellow, chemically pure—Medium.....	\$1.03	\$1.03 1/2	\$1.05	\$1.05
Chrome Yellow, chemically pure—Lemon and Orange.....			1.05	1.05
Chrome Yellow, "A"—Lemon, Medium and Orange.....	.78	.78 1/2	.80	.80
Golden Ochre.....				.56
Yellow Ochre—French.....			.50	.50
Dutch Pink.....				.90

PAINTS—CONTINUED



FIG. 1366

ACME QUALITY VARNO-LAC

For finishing old or new pine or hardwood floors, furniture and interior woodwork in perfect imitations of expensive hard woods. It stains and varnishes at a single application and can be easily applied by inexperienced persons.

List Prices per Package

Walnut, Light Oak, Mahogany, Cherry, Deep Mahogany, Dark Oak, Turkish Red, Mecca Green, Flat Black, Natural Wood Finish.

	Gals.	½-gals.	Qts.	Pts.	½-pt.	¼-pt.
Above Colors.....	\$4.20	2.25	1.20	.70	.42	.25
Enamel White.....	6.00	3.15	1.65	.90	.50	.30

ACME QUALITY DECORATORS' GROUND COLOR

For use as an undercoating for staining or graining over old work. Is the correct shade demanded by professional decorators for ground work and is clear in tone. Covers well and dries quickly with a surface of the proper texture for graining operations.

List Prices per Package

Gals.	½-gals.	Qts.	Pts.	½-pt.
\$3.25	1.70	.90	.50	.30

ACME QUALITY NEAL'S CARRIAGE AND
AUTOMOBILE PAINTS

For repainting carriages, automobiles, buggies, carts, bicycles, sleighs, sleds, boats, iron fences, settees, lawn and porch furniture, store fronts, in fact any old thing, indoors or outdoors requiring a handsome, durable varnish-gloss finish.

List Price per Package

	Gals.	½ Gals.	Qts.	Pts.	½ Pts.
Raven Coach Black.....	\$4.80	\$2.50	\$1.35	\$0.75	\$0.45
Brewster Green	4.80	2.50	1.35	.75	.45
Clear Carriage and Auto. Varnish.....	4.80	2.50	1.35	.75	.45
Brilliant Blue	6.40	3.35	1.75	.95	.55
Acme Wine	6.40	3.35	1.75	.95	.55
Auto Gray	6.40	3.35	1.75	.95	.55
Coach Green	6.40	3.35	1.75	.95	.55
Driving Cart Red.....	6.40	3.35	1.75	.95	.55
Citron Yellow	6.40	3.35	1.75	.95	.55
Carmine Red	8.60	4.45	2.30	1.25	.70
Vermilion	8.60	4.45	2.30	1.25	.70

ACME QUALITY LIQUID WOOD FILLER

For filling and surfacing all close-grained woods, such as pine, poplar, sycamore, birch, whitewood, cherry, maple, spruce, etc., at a single operation. It is an exceptionally light colored liquid filler and is adapted to work where it is desired to retain the delicate shades of the wood in their original color.

LIST PRICES PER GALLON

	Gals.	½-gals.	Qts.	Pts.	½-pt.
Barrels	\$3.10	3.35	3.70	4.45	5.60
Half-barrels and five-gallon cans.....					per gallon \$2.95
					per gallon 3.03

PAINTS AND VARNISHES—CONTINUED

ACME QUALITY ENAMEL PRIMER

An undercoating for enamels. Especially prepared to produce a suitable surface for holding up the finishing coats of enamels. Acme Quality Enamel Primer should be used in preference to flat white or lead coat on new woodwork, metal surfaces, plaster walls or painted or previously finished surfaces.



FIG. 1367

List Prices per Package

Gals.	½-gals.	Qts.	Pts.	½-pts.	¼-pts.
\$3.25	1.70	.90	.50	.30	.17

Barrels, half-barrels and five gallon cans, 5 cents per gallon less than gallon cans.

ACME QUALITY INTERIOR ENAMELS

High-class finishes for interior woodwork, walls and ceilings. Handsome, durable and economical.

List Prices per Package

Snow White, Pearl Gray, Apple Green, Shell Pink, Gobelin, Ivory, Blue Tint, Black—Lustrous or Dead Finish.

Gals.	½-gals.	Qts.	Pts.	½-pts.	¼-pts.
\$4.50	2.40	1.25	.70	.40	.25

Claret Color

Gals.	½-gals.	Qts.	Pts.	½-pts.	¼-pts.
\$5.00	2.60	1.40	.80	.50	.30

FLOOR VARNISHES

VARNOTILE. List Price per gallon in one gallon cans \$4.75

The best floor varnish that can be made. Light bodied and of medium gloss. Extremely tough, elastic and durable. Will not mar white. Will not turn white on casual exposure to water from open windows or radiators. Will rub and polish. Varnotile is strongly recommended for all interior work on fine residences, offices, hospitals, hotels or other public buildings. Nothing can surpass it for bath-rooms, window casings, etc. A better varnish for all interior work cannot be made. It has not, however, the depth or gloss of Interolite, for example, which is especially made for upright interior work. Varnotile is made especially for floors. A heavy bodied, high gloss varnish either will not dry through as quickly as a floor varnish should, or is not of the same high grade and will not be as durable.

FLOOR ROC. List Price per gallon in one gallon cans \$3.50

A popular floor varnish of medium body and good gloss. Light in color. It dries quickly and thoroughly. If drying conditions are favorable, it can be walked on, if necessary, twenty-four hours after job is complete. This does not mean over night. This is a good general purpose varnish.

ACME QUALITY ARCHITECTURAL VARNISHES—CONTINUED

EXTERIOR VARNISHES

DURABLE SPAR. List Price.....per gallon in one gallon cans \$5.50

The very best varnish that can be made for outside use at this medium price. Will give excellent satisfaction for marine or architectural use. It is tough, durable and elastic, withstanding the action of the elements to a marked degree.

VUL-K-LAC. List Price.....per gallon in one gallon cans \$4.00

A fine rubbing varnish, has good body and works so freely under the brush that it saves the painter time and money. It has a good lustre and can be rubbed and polished to a piano finish. A most excellent article for all interior work except floors.

INTERIOR COACH. List Priceper gallon in one gallon cans \$3.25

A heavy-bodied, pale-colored varnish for general interior use. May be rubbed after standing from two to three days and will take a high polish.

NO. 1 COACH. List Price.....per gallon in one gallon cans \$2.75

The best interior varnish on the market for the money. Very light in color, with good body and a high lustre. Can be rubbed in forty-eight hours and polished the next day. Takes a high polish.

ASPHALTUM VARNISHES

RAVEN BLACK ASPHALTUM. List Price.....per gallon in one gallon cans \$2.40

Made from selected bright gum and is very elastic and durable and most suitable for castings, iron fences, grates, and all structural iron work. This article is very black and brilliant. Can be reduced with turpentine or benzine. Also sold in barrels.

UNION BLACK ASPHALTUM. List Price.....per gallon in one gallon cans \$1.76

For same uses as above goods, but less expensive and suitable for quick work.

"BESTOVALL" ASPHALTUM. List Price.....per gal., in bbls. and half bbls. \$0.95

GIANT JAPAN DRYER. List Price.....per gallon in one gallon cans \$2.35

A strong dryer suitable for house painters' use. Mixes readily with oil and can be relied on as a very fine article. Will not burn or curdle the oil.

OZONE WHITE DRYER. List Price.....per gallon in one gallon cans \$2.80

Particularly adapted for use in white or very light-colored paints. Of good strength for white dryer, but not as strong as any of our darker dryers.

"BESTOVALL" WHITE LEAD

Durability and extra covering capacity is the claim we make over other brands of Pure White Lead. This lead is perfectly white, and will be found reliable for the highest class work.

Put up in 12½, 25, 50 and 100-lb. kegs and 250 and 500-lb. barrels.

List Priceper lb. \$0.15



FIG. 1368

"FORT PITT" WHITE LEAD

An excellent grade for ordinary purposes.

Put up in 12½, 25, 50 and 100-lb. kegs and 250 and 500-lb. barrels.

List Priceper lb. \$0.12



FIG. 1369

"BESTOVALL" RED LEAD

Put up in 12½, 25, 50 and 100-lb. kegs and 250 and 500-lb. barrels.

List Priceper lb. \$0.20

UTILITY VARNISH RENOVATOR FOR CLEANING AUTOMOBILE BODIES



FIG. 1370

Automobile bodies can be kept bright and lustrous at a trifling cost by using **Utility Varnish Renovator**.

New cars, or cars that have just come out of the paint shop, **Utility Varnish Renovator** will protect, preserve and add life to the varnish. This means that your car will stay brighter and newer looking a greater length of time than under ordinary conditions.

Utility Varnish Renovator will give old cars that snappy, new appearance and keep them so. The constant use of water and grit causes scratching of the varnish, which develops into cracks. **Utility Varnish Renovator** is your protection against scratches, water-breaks, blistering and checking.

Utility Varnish Renovator will loosen and dissolve road tar, grease, dirt or dust so that they can be easily removed, leaving the surface unblemished. It not only protects the varnish, but it prevents water spots, sheds the water and keeps it from checking under the strain of atmospheric changes. Positively free from acids and absolutely non-alkali.

Unexcelled on old or worn upholstery or on leather chairs, etc.

Read the simple directions and see how easy it is to save time and labor by using this **Renovator**.

Directions. Dampen clean waste or cheese cloth with **Utility Varnish Renovator** and apply to leather upholstery, body of car, hood, fenders, etc. Then wipe dry with a clean piece of waste or cheese cloth, commencing to wipe off at the place you started applying. By following directions, **Utility Varnish Renovator** will have time to loosen and absorb road-tar, grease, dirt, dust, etc., so that they may be easily removed, leaving the surface clean. By wiping dry, you will restore the varnish to its original lustre, and have a surface to which dust will not stick. Do not apply when car is wet, as (like varnish) it will not mix with water. Dry mud should be softened with **Utility Renovator** before removing.

Price, gallon caneach \$3.00
Price, quart caneach 1.00



FIG. 1371

"BESTOVALL" LIQUID METAL POLISH

Produces a wonderfully brilliant lustre to brass, copper, tin, zinc, silver, nickel, and all metals.

A few rubs and the article is handsomely burnished.

Will not soil the hands or leave deposits in corners or surface of the metal.

Will restore burnt or rusty nickel on stoves to its original lustre.

One Pint, Tin Can.....	per doz. \$ 7.00
One Quart, Tin Can	per doz. 12.00
One Gallon, Tin Can	per gal. 3.00



FIG. 1372

U. S. METAL POLISH—PASTE

Unequaled for carriage, harness, soda fountain, automobile trimmings, silver, nickel, brass, gold. Will not stain the upholstery or the enamel of the electric limousine.

No.	
1	3 oz. cans, 1, 2, 2½ gross to case.....per doz. \$1.20
2	½ lb. cans, 6 dozen to case.....per doz. 3.00
3	1 lb. cans, 4 dozen to case.....per doz. 6.00
4	5 lb. pail, 10 pails to case.....per doz. 12.00
5	10 lb. pail, 6 pails to case.....per doz. 22.80
6	25 lb. pail, 2 pails to case.....per doz. 48.00

WINTERTON METAL POLISH



FIG. 1373

A clean crimson paste, specially adapted to cleaning and polishing fine metals, brass and silver instruments, etc. Adopted by many railroads, steamship companies, mills, fire departments, water works, and electric light plants throughout the U. S. A.

Sizes	1-lb. Cans	3-lb. Buckets	5-lb. Buckets
Price	per doz. \$4.00	\$12.00	\$20.00

COTTON AND WOOL WASTE



FIG. 1374

All waste purchased from us is guaranteed to be exactly as described or can be returned at our expense. Our guarantee tag is attached to every bale.

"SNOW BALL" POLISHING

This waste is made of nothing but pure mule spun quill cop snow white thread. There is no finer material available for polishing high grade furniture, automobile bodies, and similar highly finished surfaces. It will also perform duties of other waste, but its long length and soft texture makes it specially adaptable for polishing.

Packed in 100 lb. bales only.

"A" WHITE

This grade of waste is made from single spun, soft long yarn, known as extra machine cop, and carrying absorbent and cleaning qualities that cannot be excelled. It is the best general commercial grade of white waste obtainable.

Put up in 10 lb. packages, 10 to a bale, also 50, 100 and 500 lb. bales.

"B" WHITE

This is a No. 1 grade of waste in every respect, as it carries no rag nor harsh material to detract from its properties. For any ordinary purpose, including garage work, this grade will give absolute satisfaction where a long, absorbent waste is wanted. In buying our "B" White, you are securing a waste that exceeds in quality many other brands of so-called No. 1.

Put up in 50, 100 and 500 lb. bales.

COTTON AND WOOL WASTE—CONTINUED

"G" COLORED

The best grade of colored waste on the market, occupying the same relative position among colored wastes as our "A" grade does among different grades of white. Our "G" waste might be better described as semi-colored, as it contains about 40 per cent of clean, white, soft threads, mixed with carefully selected fancy colored straight threads.

Packed in 50, 100 and 500 lb. bales.

"J" COLORED

A most satisfactory grade for general shop use. Our "J" colored is a pure cotton product, contains no material that will detract from its proper functions, and will be found to surpass all grades of colored waste at near the price.

Packed in 50, 100 and 500 lb. bales.

"E" COLORED

This waste might well be classed as a competitive grade. For rougher usage, where price is an object, our "E" colored meets every requirement. There are three or four cheaper grades of waste manufactured, but we only offer such goods as we can guarantee satisfactory.

"E" colored is packed in 100 and 500 lb. bales.

"K" WOOL

This grade is made of long fibre wool, and its unusual resiliency from the large percentage of Merino it contains makes it particularly well suited for locomotives or heavy freight cars.

Packed in 100 lb. bales.

"L" WOOL

Our "L" wool is a good commercial grade of waste, and is recommended for light cars, line shafts, and for general use in mill lubrication.

Packed in 100 lb. bales.

"SK" WOOL

Some users of wool waste prefer it in skein form, and to meet this demand we offer our "SK" grade. The quality will be found very satisfactory, and we recommend it for all uses where waste in skein form is required.

Packed in 100 lb. boxes.



FIG. 1375

WASHED SANITARY WIPING CLOTHS

SLEEVELESS AND FREE FROM
BUTTONS

Our wiping cloths are guaranteed absolutely sanitary. They are washed with pure soap, caustic soda, soda ash and chloride of lime, and are dried in reversible rotary drying machines under a fan-driven heat of 338 degrees, engendered by 100 lbs. steam pressure.

"MIXED WHITE"

Consists of soft cotton cloths of good grade material in all white and all white bodied cloths. Packed in 100 and 500 lb. bales.

"MIXED LIGHT"

Consists of good grade soft cotton cloths in color from light gingham check up to and including white bodied cloths. Packed in 100 and 500 lb. bales.

"MIXED COLORED"

Consists of soft cotton cloths of good material in color from black and up to light colored gingham checks. Packed in 100 and 500 lb. bales.

BEAVER BRAND STEEL WOOL

SOLD IN PACKAGES



FIG. 1376

These packages are printed in very attractive colors and designs and are made especially for the dealer to carry on his shelves and counter. Each package contains full instructions for the consumer, telling the various uses for the different sizes and grades of Steel Wool. They are practically dust and rust proof and can be handled in stock with practically no dirt or muss. This is certainly a big improvement over the former method of wrapping with the Steel Wool sticking out of both ends.

Nos.	585
Size	No. 0
Description	Fine
Price.....per pound	\$0.60

586	587	588
1	2	3
Med. Fine	Med. Coarse	Coarse
.43	.39	.35

KEYSTONE WASTE PAPER BALER

Nos. 1 and 2, Screw Operation

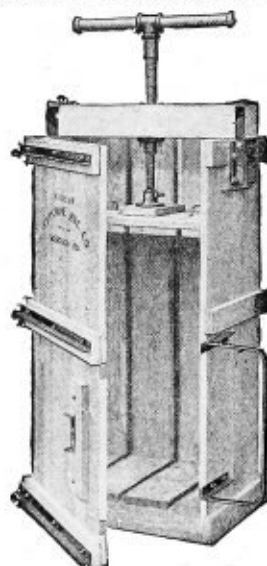


FIG. 1377

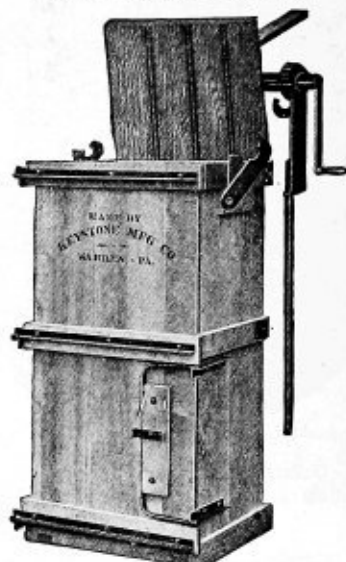
Nos. 11, 12 and 13.
Lever Operation, Automatic

FIG. 1378

WOOD BALERS, AS SHOWN ABOVE

No.	Size Bale, In.	Weight, Lbs.	Price each
1	13x20x30	100	\$17.50
2	16x20x33	120 to 150	20.00
11	13x20x30	100	30.00
12	16x20x33	125 to 150	35.00
13	20x20x33	150 to 200	40.00

STEEL BALERS

Similar in construction and appearance and operation as Nos. 11, 12 and 13 Balers illustrated above, except all steel body and fireproof.

No.	Size Bale, In.	Weight, Lbs.	Price each
40	13x18x30	60 to 75	\$30.00
41	13x20x30	100	40.00
42	16x20x33	125 to 150	50.00

85 PER CENT MAGNESIA MOULDED PIPE COVERING

Is made of selected minerals, is strictly fireproof. An extra percentage of long asbestos fiber is used in it as a binder, and our modern method of manufacture makes this a covering of the highest efficiency in non-conduction and durability. It is made in sections 3 feet long, which open with a side lap; is finished with a strong outer canvas and supplied with metal bands as fasteners; is easily applied and very desirable for steam pipes, high or low pressure. The thickness ranges from 1 inch to 1½ inches, according to sizes.



FIG. 1379

ALL-ASBESTOS PIPE COVERING



FIG. 1380

Superior Covering is made of all asbestos—a strong asbestos felt, indented and interspaced with pure asbestos fiber in such a way as to secure the highest non-conduction and durability. The materials used in this covering will resist the highest heat without injury; it is therefore specially adapted to superheated surfaces, train pipes, etc. We supply it in thicknesses of 1, 1½ and 2 inches. For extra high pressure or superheated surfaces the 1½ or 2 inch thickness should be used. Is made in 3 foot sections, with an outer canvas and supplied with metal bands. This

covering is free from breakage and may be removed and reapplied at will without loss. We supply the Superior also in sheets and blocks of such sizes and thicknesses as may be desired.

ASBESTOS AIR CELL PIPE COVERINGS

Are composed of pure Asbestos Felt of the best quality and strength and made in the most perfect way. Made in the following thicknesses:

- Asbestos Air Cell, "A," 2 ply, about ½ inch
- Asbestos Air Cell, "B," 3 ply, about ¾ inch
- Asbestos Air Cell, "C," 4 ply, about 1 inch
- Asbestos Air Cell, "D," 6 ply, about 1½ inch
- Asbestos Air Cell, "E," 8 ply, about 2 inch

C, D and E are very desirable for high pressure steam pipes; B and A for low pressure and hot water pipes; all are supplied with outer canvas and metal bands. The coverings are free from breakage and perfectly removable, as may be desired.

For prices, see following page.



FIG. 1381

FROST PROTECTIVE PIPE COVERING



FIG. 1382

This covering is a very convenient protection for cold water pipes from freezing. Is made in 3 foot sections. The inner $\frac{1}{2}$ inch is hair felt and the outer $\frac{1}{2}$ inch the best quality of wool felt. Has a finish of canvas, an inner lining of water-proof felt, and metal bands.

DOUBLE WOOL FELT SECTIONAL COVERING

This covering we recommend for use on cold water pipes to prevent freezing and prevent sweating. Is made with an inner lining of waterproof felt, finished with canvas and bands; has an inner section $\frac{1}{2}$ inch thick and an outer section of the same thickness, both the finest grade of corrugated wool felt, so made that all joints are broken when applying. We supply this covering up to 4 inches thick for special uses.

SECTIONAL PIPE COVERINGS—THREE-FOOT SECTIONS

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5
Price	per foot	\$0.22	.24	.27	.30	.33	.36	.40	.45	.50	.60	.65	.70
Size	inches	6	7	8	9	10	12	14	*16	18	20	24	30
Price	per foot	\$0.50	1.00	1.10	1.20	1.30	1.85	2.10	2.35	2.60	2.85	3.30	4.00

MINERAL WOOL

In sacks of 50 lbs. each.....price per lb. \$0.06
Sacks, extraprice each

ASBESTOS FIBRE

Price per pound.....\$.....

SILICA SODA

Pintsper dozen \$.....
Quartsper dozen
Gallonsper dozen

ASBESTOS CEMENT

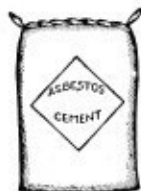


FIG. 1383

This is a dry cement and when mixed with water to make it of proper consistency it is used for covering large and irregular surfaces such as boilers, stills, domes, heaters, etc. In sacks of 100 lbs. each

"A" brandper cwt. \$.....
"B" brandper cwt.

ASBESTOS FLEXIBLE ROOFING CEMENT

Used for cementing or patching tin, metal or composition roofs, around skylights, etc. Supplied in red, brown or black colors.

100 lb. tubsper lb. \$.....
25 to 50 lb. pails.....per lb.
10 lb. cansper lb.
5 lb. cansper lb.

ASBESTOS ROLL, OR 2-PLY AIR CELL



FIG. 1384

This is a convenient sheet covering, is all asbestos and can be used on smoke pipes, hot air furnace pipes or any surface requiring a strictly fireproof non-conductor.

Price, per square foot.....\$.....

ASBESTOS PAPER

This is fireproof and extensively used for all uses requiring a fireproof paper or sheathing. Made in weights averaging about 6, 10 and 14 pounds per 100 square feet; put up in rolls of about 100 pounds, 36 inches wide.

Price, per pound.....\$.....

ASBESTOS ROLL MILLBOARD

This is made of the same materials as the sheet millboard; is softer and more flexible. Stock rolls are 36 inches wide and weigh about 100 pounds. Special widths can be supplied in fair quantities. It is specially desirable for lining walls, ceilings, etc., and for cutting into special sizes without waste.

Thicknesses and prices are:

$\frac{1}{16}$ inch, per pound.....\$.....

$\frac{1}{8}$ inch, per pound.....\$.....

ASBESTOS SHEET MILLBOARD

This is a fireproof material, made in sheets 42x48 inches, from $\frac{1}{16}$ to $\frac{1}{2}$ inch thick. Is much more dense and stiff than the rollboard; is valuable for lining walls, ceilings, stoves, ovens, for making gaskets, for packing joints of all kinds in a steam plant. Sheets weigh about as follows:

$\frac{1}{16}$ inch—4½ lbs.

$\frac{1}{8}$ inch—8½ lbs.

$\frac{1}{4}$ inch—17 to 18 lbs.

$\frac{3}{8}$ inch—26 to 28 lbs.

$\frac{1}{2}$ inch—34 to 37 lbs.

Price per pound.....\$.....

HAIR FELT

This is a felted hair, made in sheets 6x50 feet, put up in rolls. It is an excellent non-conductor of cold, sound and heat; is desirable for covering cold and hot water pipes, tanks, etc.

Thickness	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	2
Price	per square foot					

AMERICAN WINDOW GLASS

List of March 1st, 1913. Per box of 50 square feet.

Single Strength								Double Strength							
United Inches	Sizes			AA	A	B	C	United Inches	Sizes			AA	A	B	
25	6x 8	to	10x15	\$33.00	\$30.00	\$28.50	\$28.00	25	6x 8	to	10x15	\$ 46.50	\$ 40.50	\$ 38.50	
34	11x14	"	"					34	11x14	"	"				
	12x13	"	14x20	36.50	31.00	30.00	29.00		12x13	"	14x20	50.00	44.50	42.00	
40	10x26	"	16x24	39.00	33.00	31.00	30.00	40	10x26	"	16x24	55.00	48.50	44.50	
50	18x22	"	"					50	18x22	"	"				
	20x20	"	20x30	42.50	37.00	34.50	....		20x20	"	20x30	61.00	54.50	51.00	
54	15x36	"	24x30	44.00	38.00	35.00	....	54	15x36	"	24x30	62.50	56.00	52.00	
60	26x28	"	24x36	45.00	40.00	36.00	....	60	26x28	"	24x36	64.00	57.00	52.50	
70	26x34	"	"					70	26x34	"	"				
	28x32	"	30x40	48.00	43.50	39.00	....		28x32	"	30x40	68.00	61.00	56.00	
	30x30	"	"						30x30	"	"				
80	32x38	"	"					80	32x38	"	"				
	34x36	"	30x50	54.00	49.50	43.50	....		34x36	"	30x50	73.00	66.50	60.50	
84	30x52	"	30x54	57.00	52.50	47.00	....	84	30x52	"	30x54	74.50	68.00	62.00	
90	30x56	"	34x56	....	....	....	....	90	30x56	"	34x56	78.50	72.00	66.50	
94	34x58	"	34x60	....	....	....	....	94	30x58	"	34x60	80.00	73.00	68.00	
100	36x60	"	40x60	....	....	....	....	100	36x60	"	40x60	93.00	85.00	80.00	
105	40x62	"	40x64	....	....	....	....	105	40x62	"	40x64	194.50	178.50	165.00	
110	40x66	"	40x70	....	....	....	....	110	40x66	"	40x70	216.00	200.00	186.50	
115	40x72	"	40x74	....	....	....	....	115	40x72	"	40x74	242.50	221.00	208.00	
120	40x76	"	40x80	....	....	....	....	120	40x76	"	40x80	285.00	285.50	245.00	
125	40x82	"	40x84	....	....	....	....	125	40x82	"	40x84	312.00	285.50	272.00	
130	40x86	"	40x90	....	....	....	....	130	40x86	"	40x90	339.00	312.50	299.00	

An additional 10 per cent will be charged for all glass more than 40 inches wide. All sizes over 52 inches in length, and not taking more than 81 united inches, will be charged in the 84 united inches bracket. All glass 54 inches wide or wider, not making more than 116 united inches, will be charged in the 120 united inches bracket.

All fractional sizes not listed take the list of next larger sizes, plus 10 per cent.



FIG. 1385

PUTTY

In barrels, kegs and tubs.....per lb. \$.....
 In 25 and 50 lb. wooden pails.....per lb.
 In 12½ lb. tin cans.....per lb.
 In small cans, assorted sizes, from 1 to 5 lbs.....per lb.

PUTTY KNIVES

Prices upon application.

GLAZIERS' POINTS

Prices upon application.

"RED DEVIL" GLASS CUTTERS

No. 024

**FIG. 1386**

No. 024—An all iron glass cutter with steel wheel set in the head, 1 in box,
1 doz. in carton.....price per doz. \$2.00

NO. 7

**FIG. 1387**

No. 7—Has press steel head, nickel plated, containing a turret with 6
wheels, each numbered. Handle is of hardwood enameled, 1 in
box, 1 doz. in carton.....price per doz. 3.25

"RED DEVIL" CIRCULAR GLASS CUTTERS NO. 263**FIG. 1388**

Cuts circles 2 to 22 inches. Metal base, non-slipping rubber cloth mat, steel
rod graduated in inches by 16ths, thumb-rest, renewable hand-honed wheel. Two
additional wheels. Favorite cutter for automobile headlight glasses.

No. 263. One in box, 6 doz. in case.....price per doz. \$16.00

STAR WHITEWASHING, PAINTING AND SPRAYING MACHINES



FIG. 1389



FIG. 1390



FIG. 1391



FIG. 1392

STYLE A

One of the largest hand-power machines on the market today. All working parts constructed of brass, brass ball valves and removable seats. It is recommended for those having a large amount of cleaning to do.

STYLE C

This pattern is practically the same in construction as Style "A," the difference being in size and a few modifications as shown in cut, and adapted for a smaller amount of work.

STYLE F

This portable self-contained machine, equipped with 20-gallon tank is one of our most popular styles. The whole is mounted on an extra heavy truck with 7" x 2 1/2" wheels.

STYLE 20

For those desiring a machine for small or medium size work, for use continuously or at short intervals, we strongly recommend our Style No. 20. Equipped with 6-gallon container, and adapted for all classes of work.

Style	A	C	F	20
Price	\$44.00	31.00	32.00	13.50
Weight, net, lbs.....	80	65	95	20
Discharge Hose, ft.....	20	10	10	10

EQUIPMENT

Each machine is furnished complete with Spray Pipe, Nozzle, and one extra spray tip, 200 pound pressure gage, and sieve with Styles A, C and F, follower wrench, suction and discharge hose. Each machine furnished complete ready for operation.

STAR SPRAYING MACHINES—CONTINUED

No. 15



FIG. 1393

No. 21



FIG. 1394

No. 22



FIG. 1395

STYLE 15

Style No. 15 consists of a well designed spray pump mounted in 30-gallon barrel, equipped with steel wheels 22 inches in diameter. This outfit is very convenient and adapted for all kinds of spraying work. It supplies a long-felt want for Gardeners and Fruit Growers, and in addition may also be utilized for white-washing purposes.

STYLE 21

This pattern, while different in design and construction from style No. 15, is adapted for a similar class of work. Wheels furnished are of steel construction 16" diameter, and tank having a capacity of 12 gallons. Mechanical agitator operates at each stroke of the pump handle, at the same time cleaning suction strainer, a feature found only on this pump.

STYLE 22

Style No. 22 is operated by compressed air and is the only machine of this type on the market guaranteed to operate at 60 to 80 pounds pressure. Capacity $3\frac{1}{2}$ gallons. Tank is of very heavy construction riveted at intervals of one inch down entire side. This pattern can be used for all spraying purposes and is especially adapted for spraying Insecticides, Disinfectants, etc., while it will also be found very convenient for small whitewashing operations.

Style	15	21	22
Price	\$25.00	18.75	7.80
Weight, net, pounds	140	65	9
Discharge Hose, foot.....	10	10	3

EQUIPMENT

Each machine is furnished complete as illustrated with spray pipe, shut-off cock and nozzle all ready for operation.

FRANCIS PORTABLE POT GLUE HEATERS STEAM—GAS—ELECTRICITY

Gas Water Heater Attachment for Any Size Glue Heater



FIG. 1396



FIG. 1397



FIG. 1398

Fig 1396—Capacity pot—quarts.....	2	3	4	6	8	10
Price, fitted for steam.....	\$15.55	17.60	18.50	24.65	25.80	26.40

Larger sizes on request.

Fig. 1397—Capacity pot—quarts	2-2	2-3	2-8	2-16	Fig. 1398
Price, fitted for steam.....	\$22.00	24.20	28.75	46.20	Iron or all cop-
Price, fitted for gas.....	44.00	46.20	50.75	68.20	per—Prices on

request.

All of these Heaters are regular fitted—and usually wanted—with iron pots. Sizes up to and including 2 quarts capacity are enameled and larger sizes galvanized. Can be fitted with good, strong copper pots, if desired, at reasonable extra charge.

Kerosene Glue Pot
1, 2, 3 and 4 qt. sizes



FIG. 1399

Neat and complete and economical construction. Useful alike in large and small factories or work rooms. Regularly made of copper and brass throughout; with hinged cover (not jacketed to concentrate and retain heat, and Is Heating easily regulated.

This is a complete and economical "Thermo" Electric Glue Pot. The Glue Cup, Water Jacket and Heat Retaining Jacket are of copper, strongly made, fitted with Coil in- stead of Disc flame. Heating Unit, and has 3 heats.



FIG. 1400

KEROSENE GLUE POT

Fig. 1399—Capacity of pot—quarts.....	1	2	3	4
Price, complete	\$21.25	23.25	27.15	29.00

THERMO ELECTRIC GLUE POT

Fig. 1400—Capacity of pot—quarts.....	1	2	3	4
Price, complete with cover.....	\$27.20	31.90	33.40	51.50

In ordering, state whether for 110 or 220 volt circuit.

FRANCIS GLUE HEATERS OR COOKERS

STEAM-GAS-ELECTRICITY

Types A and B
Popular Glue Heater or Cooker
With Patented Glue Thermometer
Attachment

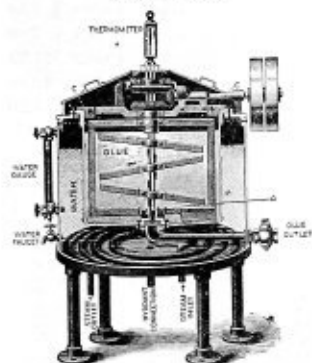


FIG. 1401

Type H
All copper and
brass Glue Heater
with Warming
Chambers



FIG. 1402

Type S
Electric Glue Heater or Cooker

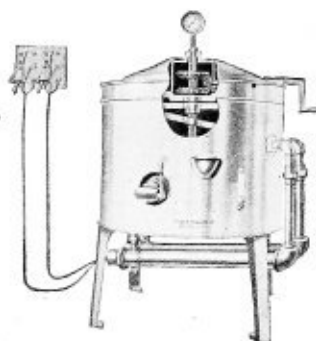


FIG. 1403

TYPES A AND B GLUE HEATERS OR COOKERS

Capacity	gallons	4	6	13	20	27
Price, Type A, for steam.....		\$126.75	134.00	158.75	172.75	202.00
Price, Type B, for steam.....		151.00	163.50	193.60	220.00	260.00

Steam temperature controller, extra. Single acting instead of double acting stirrer at lower price. Allowance made for any parts not wanted. Can be fitted with special gas water heating attachment at extra charge. Deduct \$14.50 if hand crank stirrer is wanted instead of power stirrer. There is no difference between Types A and B except that the Type B has glue tank of copper instead of galvanized plate iron, and the lower parts of stirrer of brass instead of steel. Larger sizes on request.

TYPE H-ALL COPPER AND BRASS GLUE HEATERS

With or Without Warming Pots.

Made in 5, 10, 15, 20, 25 gallon and larger sizes. With or without glue thermometer, temperature controller, stirrer, stand. Fitted for steam, gas or electricity. Price

TYPE S-ELECTRIC GLUE HEATERS

Any of our all copper and brass glue heaters or cookers can be fitted for electricity as shown. Price.....



FIG. 1404

LE PAGE'S LIQUID GLUE

IN TIN CANS FOR MECHANICS' AND
MANUFACTURERS' USES

$\frac{1}{2}$ pints,	2 dozen in case.....	per dozen	\$ 4.50
Pints,	1 dozen in case.....	per dozen	7.00
Quarts,	1 dozen in case.....	per dozen	11.25
Gallons,	$\frac{1}{2}$ dozen in case.....	per dozen	40.00
5 gallon cans, boxed.....		per gallon	3.20

FLAKE GLUE



FIG. 1405

XX Clear Flake Glue.....price per pound \$....

GLUE POTS

Capacity cup	Capacity pot	Plain Per doz.
No. 0. $1\frac{1}{4}$ pints	3 pints.....	\$10.00
No. 2. 2 pints	$2\frac{1}{2}$ quarts.....	15.00
No. 4. 4 quarts	$4\frac{1}{2}$ quarts.....	20.00



FIG. 1406

GLUE BRUSH



FIG. 1407

Best Grade, Set in Rubber.

No.	3	4	5
Diameter	in. $1\frac{3}{4}$	2	$2\frac{1}{4}$
Length	in. $2\frac{3}{4}$	3	3
Price,	each \$1.00	1.35	1.50

Jute



JUTE AND OAKUM

Oakum



FIG. 1408

FIG. 1409

Navy oakum, in bales 50 lbs.....	per pound \$.....
U. S. Navy oakum, in bales 50 lbs.....	per pound
Plumbers' oakum, in bales 50 lbs.....	per pound
Jute Gasket Packing for calking castiron pipe joints, in coils, 100 lbs.	per pound



LEAD WOOL

Used for calking joints of cast iron pipe.

No heat.

No waste.

Can be used for calking leaks in masonry as well as pipe joints.

Price

FIG. 1410

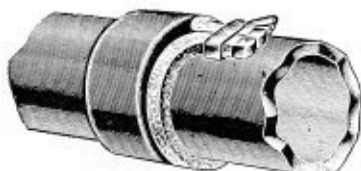
IMPROVED JOINT RUNNERS
SQUARE ASBESTOS

FIG. 1411

Number	1	2	3	4	5
Size	$\frac{3}{4}$	$\frac{3}{4}$	1	1	$1\frac{1}{4}$
For Pipe	2, 3, 4	4, 5, 6	6, 8, 10	10, 12, 14	16, 18, 20
Price	\$1.25	1.50	2.25	3.00	6.75
Number	6	7	8	9	.....
Size	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	.....
For Pipe	24	36	42	48	.....
Price	\$7.75	9.75	11.50	12.50	.....

"PARAMOUNT" BABBITT METAL
FOR HEAVY MACHINERY—HIGH SPEED



FIG. 1412

For many years Paramount Babbitt Metal has been a leader among babbitt metals for use on heavy machinery running at high speed. The formula was produced by a chemist who had years of experience in "alloying" metals and knew exactly the amount and grade of each metal to use in order to produce a babbitt of great tensile and compressive strength. Paramount Babbitt Metal has been in popular demand for more than 15 years and is guaranteed to give satisfactory service under the most difficult conditions.

"COPPER ALLOY" BABBITT METAL
FOR HEAVY MACHINERY—MODERATE SPEED



FIG. 1413

Copper Alloy Babbitt Metal is a strong, tough, high speed metal hardened and toughened to give best results when used on heavy machinery running at moderate speed. The formula for this metal was specially prepared to meet the enormous demand among the great steel mills in the Pittsburgh district.

"FORT PITT" BABBITT METAL
FOR LIGHT MACHINERY—HIGH SPEED



FIG. 1414

A Babbitt that has been giving satisfaction wherever used. Next in quality to "Copper Alloy" and produced from the best metals. Specify "Fort Pitt" on your next order—you'll not be disappointed.

MONARCH BABBITT METAL
FOR ANYTHING EXCEPT HIGH SPEED MACHINERY

**FIG. 1415**

Monarch Babbitt Metal gives very satisfactory results on all ordinary work. In compounding it receives the same careful supervision as our higher priced metals.

GENUINE BABBITT METAL
FOR HEAVY MACHINERY—HIGH SPEED

**FIG. 1416**

Genuine Babbitt Metal is generally used in journals supporting heavy loads running at very high speeds. Under these conditions it wears longer, requires less lubrication, stands grit and dust, and will not score the shaft. It is especially adapted for such service as motors, dynamos, blowers, stationary engines, saw mill machinery and crushers of various types.

MAGNOLIA BABBITT METAL

**FIG. 1417**

This make of Babbitt Metal is carefully compounded and gives general satisfaction. price per lb. \$0.25

NO. 4 BABBITT METAL

**FIG. 1418**

Price per lb. \$.....

BABBITT FILES

**FIG. 1419**

For babbitt after having run into bearings. Will not clog up like other files. This file is cut and made by hand. In sizes 12, 14, 16 and 18 inches; half round.

PIG LEAD, TIN, SOLDER, ETC.

Pig Lead

FIG. 1420
 Pigs weigh about 100 lbs.

Pig Tin

FIG. 1421
 Banca and Straights. Pigs weigh about 100 lbs.

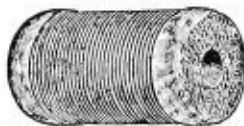
Wiping Solder

FIG. 1422
Half and Half Solder

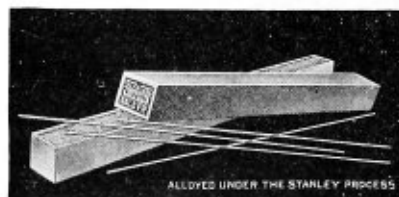
FIG. 1423

FIG. 1424
SHEET LEAD
 Data on Sheet Lead.

Weight per Sq. Foot Pounds	Approximate Thickness			Average Size of Sheet			Average Weight per Roll Pounds
	Decimals Inches	Nearest Fraction Inches	Birmingham Gage Number	Width		Length	
				Feet	Inches	Feet	
2½	.0425	5/128	19	8	3	19	390
3	.0510	3/64	18	8	3	19	475
4	.0680	1/16	16	8	6	20	680
6	.1010	7/64	12	8	9	22	1050
6	.1350	1/8	10	8	9	25	1600
8	.1350	1/8	10	8	9	25	1600

Wire Solder

FIG. 1425
 Furnished in Half and Half
 On spools of 25 and 50 lbs. each

SILVER SOLDER
 For Brazing Saws.

FIG. 1426

FIG. 1427
SYRACUSE RIBBON SOLDER

Uniformly 15 inches long, ¼ inch wide and 1/16 inch thick. In 5-lb. boxes. Takes the place of wire solder. Reduces waste.

Prices on above upon application.

STEEL BABBIT LADLES

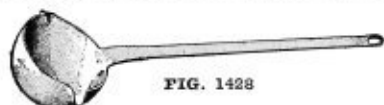


FIG. 1428

Size	inches	2½	3	3½	4	5	6	8
Price	per dozen	\$3.75	4.65	5.50	6.50	8.75	10.00	28.00

MALLEABLE IRON BABBITT LADLES



FIG. 1429

Diam.	Length	Capacity	Weight per doz.	List Price, per doz.
2½ in.	14 in.	1 lb.	11 lbs.	\$2.20
3 in.	15 in.	1½ lbs.	13 lbs.	2.50
3½ in.	15½ in.	2½ lbs.	14 lbs.	3.00
4 in.	16 in.	3½ lbs.	16 lbs.	3.25
5 in.	19 in.	7 lbs.	27 lbs.	5.60
6 in.	21 in.	12 lbs.	35 lbs.	7.25

RABBIT LADLES

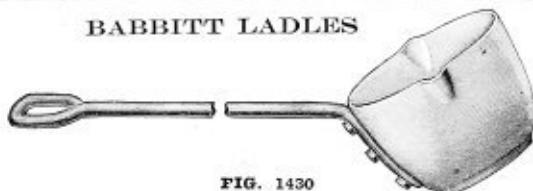


FIG. 1430

Cast bowl, wrought iron handles, 6 inch, holding about 25 lbs. or 1 qt. each \$2.50

Cast bowl, wrought iron handles, 6 inch, holding about 25 lbs., or 1 q.....each	\$2.50
Cast bowl, wrought iron handles, 8 inch, holding about 50 lbs., or 2 qts...each	3.50



FIG. 1431

MELTING POTS

4	inches	each	\$0.85
5	inches	each	1.25
6	inches	each	1.50
10	inches	each	2.80
12	inches	each	4.60
13½	inches	each	6.50

SOLDERING COPPERS



FIG. 1432

Weight per pair.....pounds	1	1½	2	2½	3	4	5	6	7	8	10	12	14
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Price per pair upon application.

Wood Handles for above.....each, \$0.25

LEAD MELTING FURNACES

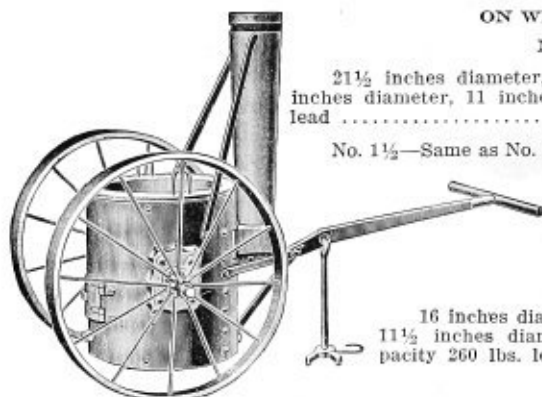
HILES PATTERN WITH DOOR

ON WHEELS

NO. 1

21½ inches diameter, 24 inches high. Pot 16¾ inches diameter, 11 inches deep. Capacity 700 lbs. leadprice, complete, \$70.00

No. 1½—Same as No. 1, but with pot rack. \$77.00



NO. 2

16 inches diameter, 24 inches high. Pot 11½ inches diameter, 8 inches deep. Capacity 260 lbs. lead.price, complete, \$63.00

FIG. 1433

No. 2½—Same as No. 2, but with pot rack. \$70.00

ON LEGS

NO. 1

21½ inches diameter, 24 inches high. Pot 15½ inches diameter, 10½ inches deep. Capacity 600 lbs. leadprice, complete, \$49.00

No. 1½—Same as No. 1, except has smoke-stack \$52.00

NO. 2

16 inches diameter, 24 inches high. Pot 11½ inches diameter, 8 inches deep. Capacity 260 lbs. leadprice, complete, \$42.00



FIG. 1434

No. 2½—Same as No. 2, except has smoke-stack.\$45.00

ALLEN SODERING STICKS



FIG. 1435



FIG. 1436



FIG. 1437

Allen	Size 1	x5 1/2 in.	each, \$0.30
Sun	Size 1 1/2	x5 1/2 in.	each, .24
Samson	Size 1	x5 in.	each, .18

Tube



FIG. 1438

ALLEN SODERING PASTE

Can



FIG. 1439

Style	No.	Each
Pkg.		
2-oz. tubes	039537	\$0.25
2-oz. cans	039538	.20
4-oz. cans	039565	.35
1 1/2-lb. cans	039539	.60
1-lb. cans	039540	1.00
5-lb. cans	039541	4.50
50-lb. pail	039562	40.00

ALLEN SODERING SALTS

Style	Each
Pkg.	
1 1/2-lb. bottles	\$0.60
1-lb. bottles	.80
5-lb. bottles	4.00

Salts



FIG. 1440



FIG. 1441

YAGER'S SOLDERING SALTS

1 1/2-lb. cans	\$0.42 1/2
1-lb. cans	.60
5-lb. cans	2.50

C. & L. GASOLINE TORCHES

No. 32



FIG. 1442

No. 31



FIG. 1446

No. 120



FIG. 1447

No. 38



FIG. 1448

No. 19



FIG. 1449

No. 107



FIG. 1444

No. 108



FIG. 1445

THE No. 32 TORCH HAS NO EQUAL WHERE INTENSE HEAT IS DESIRED. Bronze metal burner has generating chamber that superheats the gas, producing a hot blue flame, burning perfectly under severe weather conditions. Burner is fitted with hook and support for soldering copper. Capacity, 2 pints; weight, 4 1/4 lbs.Price each \$16.00

The No. 31 Torch is exactly like No. 32, but without hook and support. Capacity, 2 pints; weight, 4 1/4 lbs.Price each \$15.20

No. 107 quart size Torch is light and well balanced, and fills a long-felt want. The tank is made of heavy seamless drawn brass reinforced, and C. & L. patented automatic brass pump, with double springs, forms the handle. Remember, a pump with double springs is far superior to a pump with a single spring. The burner is fitted with wheel handle and made of bronze metal, producing a steady blue flame of intense heat. No better value was ever offered for the price.Price each \$14.40

The No. 108 Torch is sold at a moderate price and while not so effective as the better grades, is a good torch and is offered to meet an occasional request for a cheaper quart torch. Capacity, 2 pints; weight, 4 lbs.Price each \$15.20

The No. 107 Torch is exactly like No. 50, but without hook and support. Capacity, 2 pints; weight, 4 lbs.Price each \$14.40

The No. 120 is a good quart Gasoline Torch, full size, at a close price. While not as powerful as any one of the C. & L. high grade Torches for medium and ordinary work, good results will be obtained. Capacity, 1 quart; weight, 4 lbs.Price each \$13.60

The No. 122 is the same as No. 120, except pint size. Capacity, 1 pint; weight, 3 lbs.Price each \$12.00

The No. 38 Torch is the best pint size torch made. Burner is of special generator metal, which holds the heat longer; the gas is superheated before it is burned and the blue flame produced is intensely hot. Capacity, 1 pint; weight, 2 3/4 lbs.Price each \$14.40

The No. 37 Torch is exactly like the No. 38, except the burner has no hook and support. Capacity, 1 pint; weight, 2 3/4 lbs.Price each \$13.60

The No. 19 Torch is a popular pump in handle style pint torch which is light and strong and easily handled. Burner has hook and support. Capacity, 1 pint; weight, 3 lbs.Price each \$13.60

The No. 18 Torch is exactly like No. 19, but without hook and support. Capacity, 1 pint; weight, 3 lbs.Price each \$12.80

TURNER HOT BLAST TORCHES AND FURNACES

No. 215



FIG. 1450

No. 210



FIG. 1451

No. 426



FIG. 1452

No. 92



FIG. 1453

No. 315



FIG. 1454

No. 100



FIG. 1455

No. 34

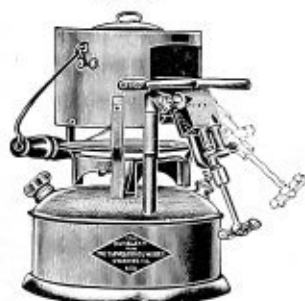


FIG. 1456

No. 56



FIG. 1457

No. 66



FIG. 1458

No.	215	210	426	92	315	100	34	56	66
			Gas. or						
For	Gas.	Gas.	Kero.	Gas.	Gas.	Alco.	Gas.	Gas.	Gas.
Capacity	Qt.	Qt.	Qt.	Qt.	Pt.	% Pt.	7 Pts.	7 Pts.	7 Pts.
Height	9 3/4	9	10	9	7 1/2	9	12	16 1/2	16 1/2
Diameter	4	4	4	4	3 1/2	2 1/2	9 3/4	8	8
Net Weight	3 1/4	3 1/4	3 1/4	3	2	1 1/4	10	7 1/2	7 1/2
Shipping Weight	5	5	5 1/2	5	3 1/2	2	17	14 3/4	14 3/4
Consumption per hr.	pints 1/2	1/2	1/2	3/4	1/2	1/4	1	3/4	3/4
Price	each 13.60	14.40	18.40	17.10	12.00	15.60	27.20	19.60	21.20

C. & L. GASOLINE FIRE POTS

No. 21



FIG. 1459

No. 1

No. 11



FIG. 1460

No. 20



FIG. 1461

No. 10



FIG. 1462



FIG. 1463

No. 5



FIG. 1464

No. 71



FIG. 1465

The No. 21 steel fire pot is the strongest coil fire pot made. The tank is made of heavy gauge welded steel with cushion protection band at bottom. Heavy uprights support extra heavy top plate. The filler is large and funnel shaped with large dust proof filler plug. Shield is of drawn steel and all small fittings are brass. Air pressure is secured by automatic pump. Capacity, 1 gallon; shipping weight, 9¾ pounds Price each \$21.20

The No. 11 steel fire pot is exactly the same as No. 21, except air pressure is produced in the tank by means of a rubber bulb. Capacity, 1 gallon; shipping weight, 9¾ pounds Price each \$19.60

The No. 20 fire pot is made with heavy galvanized iron tank, fitted with cast iron top plate and bottom ring. All small fittings are malleable iron or brass. Air pressure is produced by an automatic brass pump. Capacity, 8 pints; weight, 9¾ lbs. Price each \$16.60

The No. 10 fire pot is exactly like No. 20, except fitted with rubber bulb. Capacity, 8 pints; weight, 9¾ lbs. Price each \$15.00

No. 1 fire pot is adapted to a greater variety of uses than any other fire pot made. Tank is of heavy gauge seamless drawn steel with bottom and fittings welded in, making it strong and durable, and has extra large filler plug and funnel, with dust proof cap. Burner is swiveled and works perfectly in windy or cold weather. Will easily heat a pair of 12-lb. coppers and melt a pot of lead or solder at the same time. Patented cushion protection band at the bottom of the tank prevents injury to the base. Capacity, 1 gallon; shipping weight, 11 lbs. Price each \$27.20

The No. 5 fire pot is one size smaller than No. 1. Capacity, 5 pints; weight, 10¼ lbs. Price each \$24.80

The No. 71 fire pot is noiseless, smokeless and odorless. Sub-flame for the generator permits the flame to be turned very low. Burner has double heating surfaces, producing intensely hot blue flames, which burn from each side to the center, not affected by wind or cold. Capacity, 7 pints; weight, 14¼ lbs. Price each \$27.20

The No. 72 fire pot is one size smaller than No. 71. Capacity, 5 pints; weight, 13¼ lbs. Price each \$24.80

HAUCK WELDED STEEL KEROSENE TORCHES

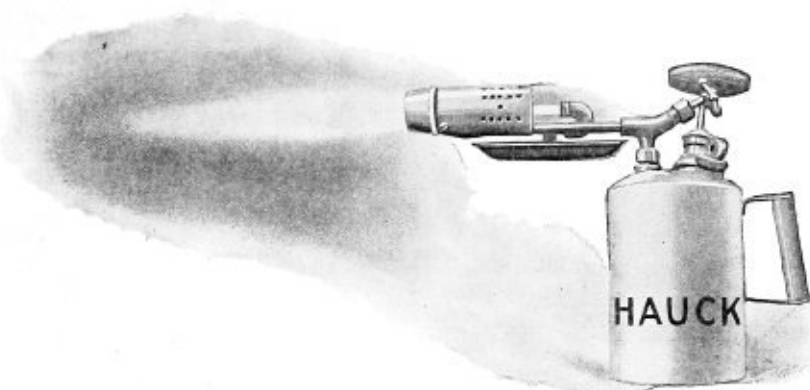


FIG. 1466

Vaporizes any grade of kerosene or coal oil, produces an intense reddish blue flame which is steady, clean, and without smoke or soot.

Nos. 14, 15 and 16 torches are equipped with automatic check to prevent back pressure from getting into tank which remains cool during operation. Carbonization is reduced to a minimum.

The flame of No. 14 torch will melt a piece of copper $\frac{1}{2}$ in. by $\frac{1}{4}$ in. in 3 minutes; $\frac{1}{2}$ in. brass rod in 2 minutes. It will heat a 2 in. shaft red hot in 5 minutes.

No.	Capacity	Oil Consumption per hour	Length Full Flame	Price Complete
10	1 Quart	1 Pint	8 In.	\$.....
14	$\frac{1}{2}$ Gal.	1 Quart	15 In.	.....
15	1 Gal.	2 Quarts	18 In.	.....
16	$1\frac{1}{2}$ Gal.	3 Quarts	22 In.	.....

HAUCK COMBINATION MELTING FURNACE AND PORTABLE HEATER

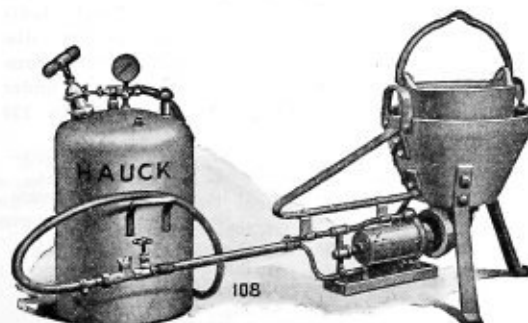


FIG. 1467

Hauck Portable Burner used in connection with melting furnace; 50 pounds of aluminum metal can be melted in 30 minutes for making aluminum welding rods from scrap aluminum.

This heater and pot will pay for itself very quickly. The burner may be detached from melting pot and used for numerous other heating jobs.

HAUCK HAND PUMP TYPE BURNER

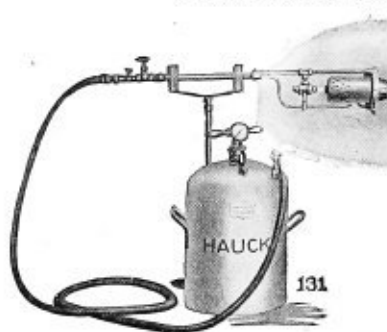


FIG. 1468

This burner is of the vaporizing type, operating without compressed air; especially suitable for field and shop work. The flame is intense and is easily regulated as desired. Before operating it is necessary to pump up from 30 to 60 pounds pressure into tank for forcing the oil to the burner; the burner does not use air from tank, therefore it can be operated continuously for several hours with a single pumping.

No.	Capacity of Steel Tank	Length of Hose	Oil Consumption per Hour	Shipping Weight	Weight of Burner	Price Complete
11	3 Gal.	6 Ft.	1 Gal.	45 lbs.	3 lbs.	\$....
7a	5 Gal.	6 Ft.	1 Gal.	60 lbs.	5 lbs.	....
7	10 Gal.	12 Ft.	1½ Gal.	80 lbs.	5 lbs.	....
8	12 Gal.	12 Ft.	2½ Gal.	95 lbs.	6 lbs.	....
9	15 Gal.	12 Ft.	3 Gal.	110 lbs.	8 lbs.	....

HAUCK PORTABLE OIL BURNER

Compressed Air Type. Will ignite instantly without previous heating



FIG. 1469

This burner is of the atomizing type and should not be confused with the above "Hand Pump Type."

Burns the cheapest grade of crude, fuel, kerosene oil or distillate, with compressed air under

any pressure varying from 10 to 120 pounds.

No.	Capacity of Steel Tank	Two Lengths Oil and Air Hose Each	Oil Consumption per Hour	Air Consumption Cubic Feet Free Air per Minute	Net Weight Complete Outfit	Weight of Burner	Price Complete
1	16 Gal.	12 Ft.	4 Gal.	20	90 lbs.	19 lbs.	\$....
2	15 Gal.	12 Ft.	3 Gal.	15	85 lbs.	17 lbs.	....
4	12 Gal.	12 Ft.	2 Gal.	12	70 lbs.	13 lbs.	....
5	10 Gal.	12 Ft.	1 Gal.	8	60 lbs.	7 lbs.	....
5A	5 Gal.	12 Ft.	½ Gal.	5	45 lbs.	5 lbs.	....

We can supply Combination Outfits for operating with either Hand Pump or Compressed Air Burners.

No. 48 for Gasoline
No. 48A for Kerosene



FIG. 1470

Size of flame at burner, . . . 2 inches
Length of flame, . . . 12 inches
Consumption, about 3 qts.
per hour.

TURNER HOT BLAST BRAZING FORGES

This powerful brazer is more extensively used than any other on the market. It is equipped with a single Giant Burner mounted on a swing joint "S," so that the flame can be pointed up or down.

The pump on the side, as shown in cut, is used to force air into the tank and air pressure is indicated by the gauge. When ordering, state if brazer is required for kerosene or gasoline. No. 48A for kerosene includes a gasoline torch for generating the burners.

No. 88 Brazer and
No. 530 Foot Pump
For Gasoline



FIG. 1471

Style	Cap'ty	Height	Diam.	Net. Wt.	Shipping Wt.	Price Each
No. 48	8 Gals.	40 in.	12 1/4 in.	88 lbs.	145 lbs.	\$120.00
No. 48A	8 Gals.	40 in.	12 1/4 in.	88 lbs.	145 lbs.	138.60
No. 88	8 Gals.	40 in.	12 1/4 in.	82 lbs.	125 lbs.	117.40

Size of flame at burner of No. 88, 1 1/4-inch; length of flame, about 10 inches; consumption, about 2 quarts per hour.

GAS SOLDERING FURNACE

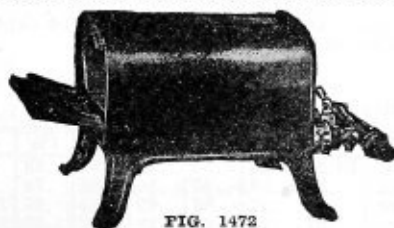


FIG. 1472

FOR NATURAL, ILLUMINATING, OR PRODUCED GAS

When sending in order, please state what kind of gas will be used and whether hose or pipe connections desired.

The Improved Superior has adjustable air mixers.

It burns with a mixture of air and gas in proportion of about 92 per cent.

of air and 8 per cent. of gas, giving an excellent heat.

The fire brick keeps the heat within the furnace and prevents the same from radiating.

The center projection of the brick on furnace No. 4 divides the heat so it is kept around each soldering iron.

No. 3. Single Burner, with Firebrick	\$4.00
No. 4. Double Burner, with Firebrick	5.00

WATER HOSE

USED FOR GENERAL CONDUCTING PURPOSES



FIG. 1473

"BESTOVALL"

Our highest grade of unjacketed water hose. It is strong and durable, and we recommend it for use under severe conditions.

The tube is thick and of best quality; the duck is heavy and firmly joined by a strong friction.

The cover is tough to resist external wear.

"BAY STATE"

Second only to "Bestovall" in strength and durability; made of high-grade stocks throughout and will give entire satisfaction.



FIG. 1474

"FORT PITT"

A medium grade, but a good stout hose that can be depended on for service. It is unusually good value for the price.

"TIGER"

A hose that will give excellent service for the price.

Internal, Diameter..in.	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$
Price, 2-ply....per foot	\$0.20	.25	.33	.42	.50	.58	.66	.75	.83	.92
Price, 3-ply....per foot	.25	.30	.40	.50	.60	.70	.80	.90	1.00	1.10
Price, 4-ply....per foot	.30	.37	.50	.62	.75	.87	1.00	1.12	1.25	1.37
Price, 5-ply....per foot	.37	.46	.62	.77	.93	1.08	1.25	1.40	1.56	1.71
Price, 6-ply....per foot	.45	.55	.75	.93	1.12	1.30	1.50	1.68	1.87	2.05
Internal, Diameter..in.	3	$3\frac{1}{2}$	4	5	6	7	8	9	10	....
Price, 2-ply....per foot	.99	1.16	1.32	1.65	1.98	2.31	2.64	2.97	3.33	....
Price, 3-ply....per foot	1.20	1.40	1.60	2.00	2.40	2.80	3.20	3.60	4.00	....
Price, 4-ply....per foot	1.50	1.75	2.00	2.50	3.00	3.50	4.00	4.50	5.00	....
Price, 5-ply....per foot	1.87	2.18	2.50	3.13	3.75	4.38	5.00	5.63	6.25	....
Price, 6-ply....per foot	2.25	2.62	3.00	3.75	4.50	5.25	6.00	6.75	7.50	....

All intermediate sizes charged at the list price of the next larger size thus: $1\frac{1}{4}$ -inch is charged at $1\frac{1}{2}$ -inch price, etc. Furnished regularly in 25 and 50-foot lengths.

For cotton or wire wrapping, see page 547.

STEAM HOSE

The great heat to which steam hose is subjected tends to over-vulcanize the rubber tube, which becomes hard and may crack, allowing the steam to penetrate between the plies of duck and burst the hose. This is especially likely to occur when full pressure is turned on instantly. Hose tubes are sometimes blown out or torn by a quick rush of steam, and whenever a heat of from 200 to 400 degrees is applied instantly to the cold rubber, the life of the hose is shortened. Steam should be turned on gradually.

As occasion often requires that hose be used under a pressure of 125 pounds (or 353 degrees of heat) it can readily be seen that durable steam hose is difficult to manufacture. The best will gradually yield to the action of intense heat accompanying high pressure.

The higher the grade of steam hose the better will be the results obtained under any pressure.

While a low grade will stand the pressure for a time, it cannot be expected to last as long as a better grade.

When ordering it would be advisable to inform us fully as to the work the hose will be required to do, and under what pressure it will be placed. We can then judge better what grade to apply on the order.

CONDENSED TABLE OF COMPARATIVE TEMPERATURES

Steam Gage	Degrees Fahrenheit	Steam Gage	Degrees Fahrenheit	Steam Gage	Degrees Fahrenheit
0	212	40	287	100	338
5	228	50	298	105	341
10	240	60	307	110	344
15	250	70	316	115	347
20	259	80	324	120	350
30	274	90	331	125	353

* TABLE OF PRESSURES

Giving steam pressure in pounds that different sizes and plies of hose should stand.

Inch	3-ply	4-ply	5-ply	6-ply
$\frac{1}{2}$	40 lbs.	80 lbs.	120 lbs.	160 lbs.
$\frac{3}{4}$	30 lbs.	60 lbs.	90 lbs.	120 lbs.
1	20 lbs.	40 lbs.	70 lbs.	100 lbs.
$1\frac{1}{4}$	15 lbs.	30 lbs.	60 lbs.	80 lbs.
$1\frac{1}{2}$	13 lbs.	26 lbs.	50 lbs.	65 lbs.
2	10 lbs.	20 lbs.	40 lbs.	55 lbs.

STEAM HOSE—CONTINUED

When ordering, always state working pressure—See page 531.



FIG. 1475

“BESTOVALL”

A strictly high grade, with a special tube and friction made to withstand the hardening action of steam for the longest possible time.

In this hose particular attention is given to see that the tube is firmly joined to the fabric.

“BAY STATE”

This is an excellent steam hose, with high-grade tube and friction. It is not intended for the highest pressure, but when used under moderate pressures will prove very durable and will give perfect satisfaction.



FIG. 1476

“FORT PITT”

This is a good, medium priced hose. It is not as strong as Bay State, being intended for low pressure only. It will give good service. Made in sizes up to 1½ inches inclusive.

For List Prices, see following page.

For windings on above hose, see pages 547 and 548.

STEAM HOSE—CONTINUED

When ordering, always state working pressure. See page 531.



FIG. 1477

"COWEN"

This hose is constructed of compounds which being vulcanized under higher pressure than ordinarily used, withstand far better the action of the high steam pressures when put into service, consequently it is more durable than any other hose of similar construction.

Not only is the hose itself extremely high grade but the addition of the heavy seamless cotton jacket gives much extra strength and the hose will stand practically 1000 pounds hydraulic pressure.

Not only is the jacket painted but in order to more thoroughly protect the cotton fibres it is treated with a composition which renders it water-proof and prevents hardening or cracking under high pressure. As a protection against outside wear, this jacket has proven to be the very best of its kind and as it will not unwind if cut, the hose is thoroughly protected until the jacket is entirely worn out.

Made in following sizes and plies:

Size	inches	$\frac{1}{4}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Ply		5	5	5	6	6	8

PRICE LIST—STEAM HOSE

Internal Diameter Inches	3-Ply Per Foot	4-Ply Per Foot	5-Ply Per Foot	6-Ply Per Foot	7-Ply Per Foot	8-Ply Per Foot
$\frac{1}{2}$	\$0.47	\$0.56	\$0.70	\$0.84	\$0.98	\$1.12
$\frac{3}{4}$	.57	.71	.87	1.05	1.23	1.41
1	.70	.87	1.07	1.28	1.50	1.70
$1\frac{1}{4}$	.85	1.04	1.30	1.56	1.82	2.08
$1\frac{1}{2}$	1.02	1.25	1.56	1.87	2.18	2.50
$1\frac{3}{4}$	1.18	1.45	1.81	2.17	2.53	2.90
2	1.34	1.66	2.07	2.49	2.90	3.32
$2\frac{1}{4}$	1.50	1.87	2.33	2.80	3.27	3.74
$2\frac{1}{2}$	1.66	2.08	2.60	3.12	3.64	4.16
3	2.00	2.80	3.50	4.20	4.90	5.60

Intermediate sizes take the list price of next larger size.

For windings on above hose, see pages 547 and 548.

COTTON RUBBER LINED MILL HOSE

For Hand Engines, Factories, Warehouses, Hotels, Steamboats, Public Institutions, Etc.

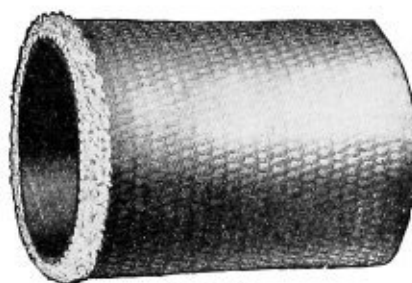


FIG. 1478

"BESTOVALL"

This is our highest grade and most reliable make of this style hose. It is made from specially selected rubber and long fibre duck, chemically treated to withstand mildew and rot the longest time possible.

Brands.	Description	Working Pressure, Lbs.	List, Per Foot				
			1	1½	1¾	2	2½
BESTOVALL	Best grade mill hose manufactured	450	\$0.40	.45	.50	.65	.80
BULL DOG	Extra high quality	400	.40	.45	.50	.65	.80
FORT PITT	Best medium price mill hose made	350	.40	.45	.50	.65	.80
INVINCIBLE	Good grade for ordinary purposes	300	.40	.45	.50	.65	.80

Couplings are extra and are only furnished when ordered.

O. K. UNDERWRITERS' COTTON RUBBER LINED HOSE

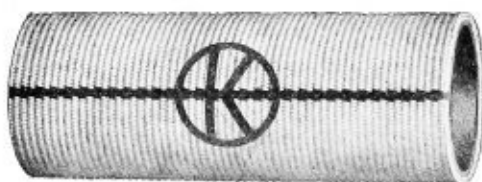


FIG. 1479

The Underwriters, both the Associated Mutual Fire Insurance Association and the National Board of Fire Underwriters, have spent much time in developing a perfect fire hose for mill and other building protection.

The O. K. brand was the original Underwriters' hose and meets all the requirements of either specification.

It is the best hose that it is possible to make.

Made in 2½ inch only, but is generally referred to as 2½ inch. Made only in 50-foot sections. Sample thread of coupling must be furnished.

Price per foot, coupled.....\$1.00

COTTON, RUBBER LINED, DOUBLE JACKET HOSE

For Fire Departments and All Other Purposes Requiring Special High Pressure,
External Wear and Other Hard Usages

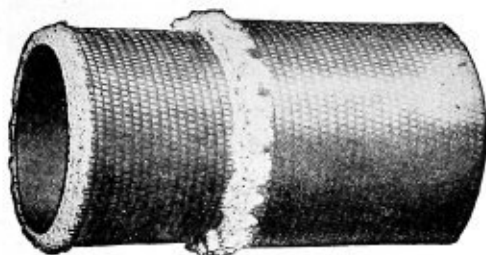


FIG. 1480

“BESTOVALL”

Jacket made of long fibre India cotton and tube of fine Para rubber; it is the best brand of Double Jacket Cotton Fire Hose manufactured. Superbly made. Strong, as the name indicates. Guaranteed to stand a water pressure of 450 pounds to the square inch. Adapted to the use of steam fire-engines and other high-pressure service.

“FORT PITT”

This brand is our second-best grade of Double Jacket Cotton Fire Hose. The Jackets are woven coarser than “BESTOVALL,” and the inner lining, while not so pure, is strictly high grade and is fully guaranteed to stand 400 pounds pressure to the square inch.

“BAY STATE”

This grade is in general use and is well and favorably known, being used by many fire departments throughout the country.

Made in sections of 50 feet only. Couplings are extra and are furnished only when ordered.

Prices quoted upon application.

UNLINED LINEN FIRE HOSE

For Fire Protection on Inside of Buildings

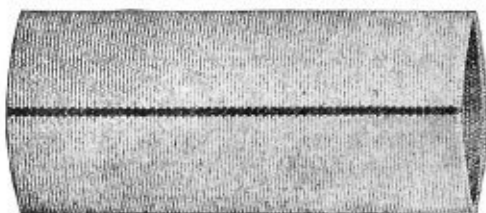


FIG. 1481

The advantage of linen hose over rubber lined hose for interior work in public buildings, theatres, hospitals and similar places, is in the fact that it can be packed away in a small place, and remain almost indefinitely without deterioration. After being used it should be thoroughly dried before being stowed away.

Linen hose is not intended for outside work, but it is sometimes used for such work in isolated plants, or where the pressure is light. It should not be used where it must be dragged about over rough surfaces.

For emergency hose in hotels and office buildings where it may lie on racks for years without being used, the hard woven linen hose without rubber lining is required.

A cheap linen hose is worthless. We offer two grades, both to Underwriters' specifications.

"BLACK LINE"

"SERVICE"

Made in sizes from 1 to 3 inches in 50 and 100-foot sections. Couplings are extra and are furnished only when ordered.

Prices upon application.

SEWED TANK HOSE

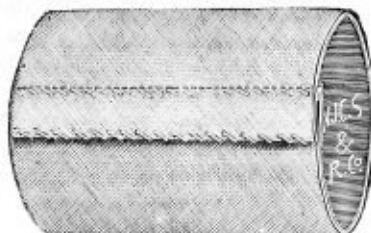


FIG. 1482

For conducting large volumes of water long distances over unequal ground, for draining purposes and hydraulic mining. Made from the best quality cotton duck, triple stitched.

Made in sizes 4 to 12 inches. Price on application.

GARDEN HOSE

Reels 250 to 500 Feet

"PARAMOUNT"



FIG. 1483

"PARAMOUNT" is a moulded hose.

The features of this hose are:

Continuous lengths which can be cut and coupled in any length desired by the user.

Seamless construction. Every strand of cotton is continuous and there are no seams in either cotton or rubber.

Paramount being moulded under high pressure, both internal and external, it does not easily kink.

Our Paramount hose is made with a plain smooth rubber cover, thick durable tube, two separate and independent braids of hard twisted cotton, between which is a distinct layer of rubber.

Furnished on reels of 250 and 500 feet or cut to any length desired.

No extra charge is made for couplings on lengths 50 feet or over.

$\frac{1}{2}$ -inch.....price per foot, 40c $\frac{3}{4}$ -inch.....price per ft. 45c

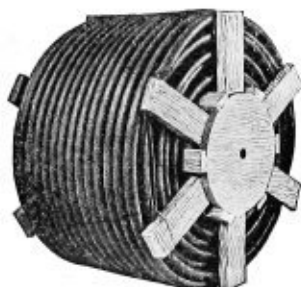


FIG. 1484

"GAGE SPECIAL"



FIG. 1485

This is a multiple fabric garden hose of the highest quality. Made with seamless rubber tube, seven plies of fine firmly woven fabric (vulcanized together with a very high grade friction or cement) and a heavy black rubber cover.

The strength, durability and general merit of this hose have made for it a host of satisfied users.

We recommend it for any service and for the highest pressure.

Made in 50-foot sections, coupled.

$\frac{1}{2}$ -inch.....price per ft. 40c $\frac{3}{4}$ -inch.....price per ft. 45c

"BESTOVALL"



FIG. 1486

The Hose With a Red Cover

BESTOVALL garden hose has seven plies of fabric, a thick tube and a high grade red rubber cover.

The general construction is the same as our "Gage Special" brand and it can be depended upon to give equal service.

Made in 50-foot sections, coupled.

$\frac{1}{2}$ -inch.....price per ft. 40c $\frac{3}{4}$ -inch.....price per ft. 45c

GARDEN HOSE—CONTINUED



FIG. 1487

"FORT PITT"

Our "Fort Pitt" brand of garden hose is made with six plies of fabric and a good durable tube and cover. It is an exceptional value and the most popular medium priced hose on the market. Fully equal to the average heavy three-ply hose and much less liable to kink.

Made in 50-foot sections, coupled.

$\frac{1}{2}$ -inch.....price per ft. 30c $\frac{3}{4}$ -inch.....price per ft. 36c



FIG. 1488

"MONARCH"

"Monarch" is a 5-ply hose and for medium pressure will give satisfactory service. Good value at the price and with proper care will last several seasons.

Made in 50-foot sections, coupled.

$\frac{1}{2}$ -inch.....price per ft. 25c $\frac{3}{4}$ -inch.....price per ft. 30c



FIG. 1489

"BLACK LINE"

"BLACK LINE" is a rubber lined, woven cotton hose and is frequently preferred to rubber hose because it is very light in weight and more easily handled. It will resist as much pressure and if given good care will last for many seasons of ordinary use.

Made in 50-foot sections, coupled.

$\frac{1}{2}$ -inch.....price per ft. 40c $\frac{3}{4}$ -inch.....price per ft. 45c

AIR DRILL HOSE



FIG. 1490

"BESTOVALL"

This hose is made with high-grade tube, four plies heavy duck with fine quality of friction, a thick rubber cover, and over all is vulcanized a heavy frictioned canvas cover, making five plies in all. This is unquestionably the best value it is possible to offer in unjacketed air drill hose.

Made in 1-inch size only and of 5-ply construction.

Price, per foot.....\$1.07



FIG. 1491

"FORT PITT"

Has an oil resisting tube, 5 plies of canvas and a rubber cover with a wire winding of $\frac{1}{2}$ -inch half oval wire. A strong serviceable hose, popular with coal mines. Made in 1-inch size only.

Price, per foot.....\$0.80

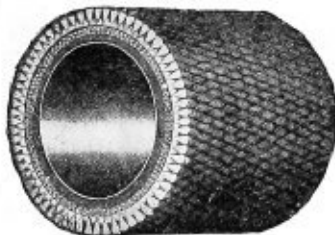


FIG. 1492

"YELLOW JACKET"

To meet a growing demand for a heavy jacketed air drill hose at a medium price, we offer "Yellow Jacket" brand. This hose is constructed of 9 plies of heavy sheeting, a good grade of tube and cover, and with a heavy woven cotton jacket will give excellent service.

Made in 1-inch size only.

Price, per foot.....\$1.00

NOTE—Air Drill or Mining Machine Hose can be fitted with Pittsburgh air drill or Knox type couplings. A spud is furnished with these couplings making them suitable for 1-inch or $1\frac{1}{4}$ -inch connections.

For windings, see pages 547 and 548.

PNEUMATIC TOOL HOSE

For All Kinds of Pneumatic Drills, Riveters, Hammers, Hoists, Etc.



FIG. 1493

"PARAMOUNT"

"PARAMOUNT" Pneumatic Tool is a moulded hose of triple braid construction with high grade oil proof tube and smooth rubber cover. Every strand of cotton is continuous and there is no seam in either cotton or rubber. This hose is recommended for most severe conditions. Is made in continuous lengths which can be cut and coupled to any length desired by user.

$\frac{3}{8}$ -inch.....	price per ft.	30c
$\frac{1}{2}$ -inch.....	price per ft.	36c
$\frac{3}{4}$ -inch.....	price per ft.	45c



FIG. 1494

"FORT PITT"

This is composed of high grade tube stock of good heavy sheeting construction, good quality rubber cover and over all is vulcanized a ply of frictioned duck.

The outside ply serves as a protection against chafing or cutting and adds materially to the life of the hose. A first class all around hose, made in the following sizes and plies:

$\frac{1}{4}$ -inch, 6-ply.....	price per ft.	25c
$\frac{3}{8}$ -inch, 6-ply.....	price per ft.	30c
$\frac{1}{2}$ -inch, 6-ply.....	price per ft.	36c
$\frac{3}{4}$ -inch, 6-ply.....	price per ft.	45c

For windings, see pages 547 and 548.

COKE HOSE

All grades listed below furnished in 1-inch size only.

9-Ply Coke Hose

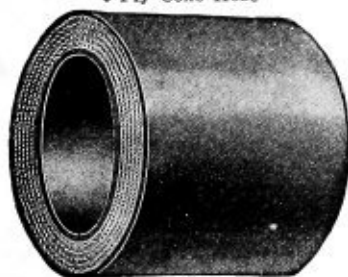


FIG. 1495

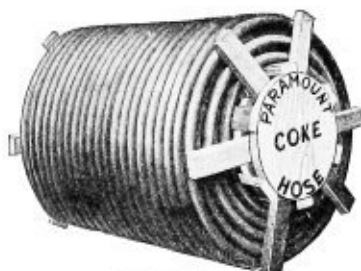


FIG. 1496

Coke Hose is in greater demand in the Pittsburgh district than any other style. We have made a careful study of the various constructions. Our customers will find the molded construction far superior to the old style "9-ply," although we sell large quantities of the latter. For many years we have supplied coke hose to the largest users in America. Any make furnished wire wound upon request, although we do not recommend it.

"PARAMOUNT"

We give below ten good reasons why "Paramount" Coke Hose should be used:

1. It is very pliable, without any tendency to kink.
2. The yarn is twisted and cabled to insure uniformity.
3. Each cable is tested, and will hold a weight of 200 pounds without breaking.
4. Being made under pressure, all defects are developed during the process of manufacture.
5. Owing to the peculiar way in which this hose is vulcanized, the life of the rubber is prolonged.
6. The tube will not harden and crack, as is the case with old-style hose.
7. Will outwear any other hose of equal price about two to one.
8. Will withstand 50 per cent more pressure than the old-style hose.
9. Utter impossibility for the fabrics or plies to open or unwrap.
10. Each fabric is a separate hose in itself, yet the whole is one homogeneous mass.

Paramount is made in continuous lengths and can be cut to any length desired.

Price per foot.....\$0.60

"BESTOVALL" 9 PLY

The best grade of 9-ply coke hose on the market. Made with 9 plies light firm fabric, a high grade tube and a cover to resist the drying, charring and burning to which coke hose is frequently subjected. Made in sections of 50 feet each.

Price per foot.....\$0.50

"FORT PITT" 8 PLY

A good medium grade coke hose similar in construction to the "BESTOVALL" brand. Price per foot, \$0.45.

"DANDY" 9 PLY

A high-grade popular brand of coke hose. Price per foot, \$0.50.

"WHITE STAR" 9 PLY

A good grade of medium price coke hose. Price per foot, \$0.45.

"BESTOVALL" BREWERS' HOSE

For Conducting Beer, Either Hot or Cold.

**FIG. 1497**

The lining is made of a gum that will resist the action of hot liquids and steam. Special care is taken to have the tube smooth and free from indentations and other imperfections. Cover made extra heavy to stand rough usage. Warranted not to kink.

Size,	inches	List Per Foot				
		$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Highest Grade 4-ply Duck and Specially Compounded						
Sanitary Tube		\$0.71	.87	1.04	1.25	1.66

For each additional ply, add 25 per cent. to list. Use Regular Steam Couplings. Furnished only when ordered and are extra.

TANNERS' HOSE

We recommend regular Acid Hose for tanners' use, when conducting steam into vats; but most manufacturers furnish regular Steam Hose, using the Steam Hose lists and discounts. Unless otherwise specified, we will send regular Acid Hose.

"BESTOVALL" CHEMICAL ENGINE HOSE

For Chemical Engines and Fire Extinguishers

**FIG. 1498**

The inner tube is especially compounded to resist the deteriorating effects of chemical liquids and gases. Has red cover of highest grade.

Size	inches	List Per Foot		
		$\frac{1}{2}$	$\frac{3}{4}$	1
Highest Grade 4-ply Duck, Specially Compounded Tube.....		\$0.56	.71	.87

For each additional ply, add 25 per cent. to list. Special couplings required, a sample should be furnished when wanted.

"BESTOVALL" OIL HOSE

For Use in Conducting Oil

Construction of 4-Ply

Oil is a natural enemy of rubber, because of its tendency to destroy the properties of rubber very quickly.

It is important therefore to keep in mind that the best is only good enough.

Our "BESTOVALL" Oil Hose is made of highest quality materials throughout and will give good service.

**Fig. 1499**

Sizes	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price per foot.....		\$0.56	.71	.87	1.04	1.25	1.66

List per foot, for 4 ply

For each additional ply add 25 per cent to list.

Use steam hose couplings.

"BESTOVALL" ACID HOSE

Used for Conducting Acids.

Construction of 4-Ply

**FIG. 1500**

Our Acid Hose is made with a very pure lining, which is adapted to resist as much as possible the destroying action of certain acids, chemicals, and dye-stuffs. When ordering it is always well to state the kind and temperature of the liquid the hose is expected to conduct.

Size	inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
BESTOVALL 4-Ply, $\frac{1}{8}$ in. Inner Tube		\$1.50	1.90	2.20	2.65	3.55	4.40	5.30
BESTOVALL 4-Ply, $\frac{3}{16}$ in. Inner Tube		1.80	2.20	2.75	3.30	4.35	5.40	6.40
BESTOVALL 4-Ply, $\frac{1}{4}$ in. Inner Tube		2.20	2.80	3.40	4.00	5.20	6.40	7.60

For each additional ply, add 25 per cent. to list.

Use regular Steam Hose Couplings, not furnished unless ordered and are extra.



FIG. 1501

"BESTOVALL" SAND BLAST HOSE

For Cleaning Castings, Removing Rust,
Old Paint, etc.

The demand for this style hose is growing very rapidly. The inner tube must be made of pure para rubber, as no other material will resist the cutting effect of the sand driven through the hose at high pressure.

Size	inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
$\frac{1}{8}$ -in. Inner Tube.....		\$1.50	1.90	2.20	2.65	3.55	4.40
$\frac{1}{4}$ -in. Inner Tube.....		1.80	2.20	2.75	3.30	4.35	5.40
$\frac{3}{4}$ -in. Inner Tube.....		2.20	2.80	3.40	4.00	5.20	6.40

For each additional ply, add 25 per cent. to list of 4-ply. Use Steam Hose Couplings.

"BESTOVALL" GASOLINE HOSE



FIG. 1502

This hose is required to convey gasoline and the tube must be so compounded that it will remain reasonably hard and firm, to resist the penetrating and dissolving action of gasoline. Our hose will convey gasoline without discoloration or sediment.

Prices upon application.

"BESTOVALL" VACUUM HOSE



FIG. 1503

For use in connection with vacuum cleaning apparatus. This service demands a light and flexible hose with wall reinforced to prevent collapse, and tube of good quality, to resist the action of the small particles of sand, grit, etc., that are drawn through the hose. Vacuum Hose is generally made with spirally coiled wire imbedded in the tube or between the plies of cotton duck. Can be furnished covered with braided cotton in various combinations of colors.

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$
Price,	per foot	\$0.55	.65	.75	.93	1.13	1.31	1.50	1.69	1.88

SUCTION HOSE WITH CAPPED ENDS

For Wrecking, Mining, Excavating, Hydraulic Connections, Etc.

Suction Hose differs from conducting hose principally in being made to withstand an exterior collapsing tendency instead of an internal bursting pressure.

Wire lining or insertion is employed and is very effective.

Round or flat wire is spirally wound with sufficient space between the spiral to retain proper flexibility of the hose.

Suction Hose is made either smooth or rough bore. In the former the wire is inserted in the tube of the walls of the hose. In the latter the tube and walls are built up on the wire lining and the wire is imbedded in the tube. We carry both styles.

Smooth bore is generally used because there is less friction in the passageway, but we recommend rough bore for rock, gravel, or sand, or where the materials are rough and are liable to destroy the tube of the smooth bore. Rough bore also stands a greater suction pressure because there is no inner tube to collapse. Rough bore should not be used for acids as it destroys the wire. Smooth bore always sent unless otherwise ordered.

Smooth Bore, Flat Wire

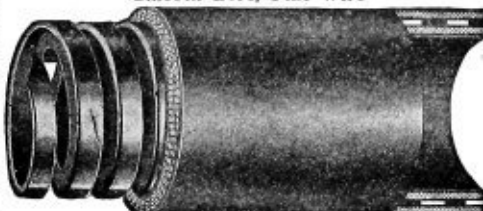


FIG. 1504

Smooth Bore, Round Wire



FIG. 1505

Rough Bore, Flat Wire

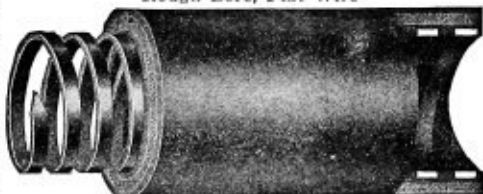


FIG. 1506

Brands.	Description.
BESTOVALL...	Highest Quality, made all sizes up to 12 inches.
BLUE BELL...	High Quality, made all sizes up to 12 inches.
FORT PITT...	Same as "Bestovall," but lighter, made all sizes up to 8 inches.
BAY STATE...	Same as "Blue Bell," but lighter, made all sizes up to 8 inches.
TIGER.....	Good Quality, all sizes up to 6 inches.

All brands furnished either rough or smooth bore.

List, Per Foot, of Rough and Smooth Bore Suction Hose.

Size, inches.....	1½	2	2½	3	3½	4	5
Smooth Bore, Flat Wire.....	\$1.70	2.60	3.50	4.50	5.50	6.50	8.50
Rough Bore, Round or Flat Wire.....	1.50	2.30	3.10	4.00	4.90	5.80	7.60
Size, inches.....	6	7	7½	8	9	10	12
Smooth Bore, Flat Wire.....	\$10.50	13.50	15.00	16.50	19.50	22.50	27.50
Rough Bore, Round or Flat Wire.....	9.50	12.00	13.50	15.00	17.50	20.00	25.00

INSTRUCTIONS FOR ORDERING

When ordering, give brand and inside diameter. Nipples are furnished unless otherwise specified. If other than iron pipe thread wanted, send sample of thread. If wanted without nipples or couplings, state if plain ends for couplings or enlarged ends for nipples are required. All fittings charged as an extra.

AGRICULTURAL SUCTION HOSE

WIRE-LINED NON-KINK

Especially designed for use in connection with thresher outfits, although it is frequently used for irrigation purposes.

A light, pliable, but strong hose is desirable, and though we make it either rough or smooth bore, we recommend the use of rough bore. By the process of manufacture the wire in rough bore is embedded, making an almost smooth water way.

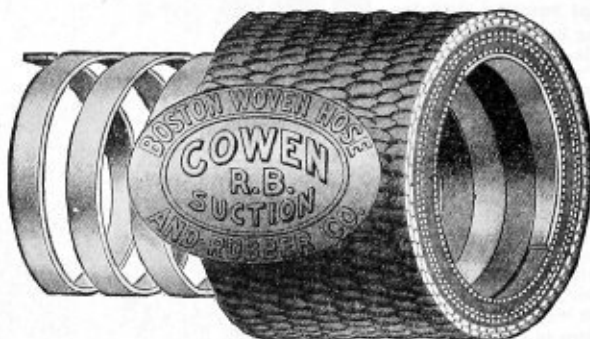


FIG. 1507

"COWEN, RED"

The highest grade of Agricultural suction hose. It is composed of a good quality hose over which is woven an extra heavy cotton jacket. This cotton jacket is treated with a preparation which makes it water-proof and prevents it from rotting. It also serves as a protection from the hard usage which an agricultural hose receives. Made in multiples of five feet in 2-inch diameter only.

Price per foot.....\$1.50

"HARVESTER, RED"

This is of the same general construction as the Cowen, but with a braided instead of a woven jacket. The hose is somewhat lighter and more flexible than the Cowen.

Made in multiples of 5 feet and in 2-inch size only.

Price per foot.....\$1.50

HARD RUBBER SUCTION HOSE

For Very Light Suction Work, Vacuum Cleaners, Etc.

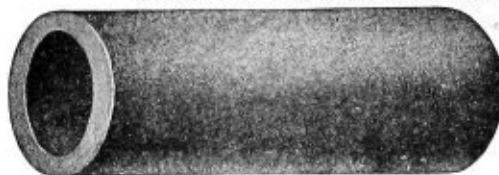


FIG. 1508

This style hose is not in as general use as heretofore because of the constantly increasing demand for hose that will stand hard usage. It is made in several grades, none of which are recommended except for very light work.

BLUE BELL.....Best grade in sizes up to 2½ inches.

TIGER.....Medium grade in sizes up to 1½ inches.

Size, inches	¾	1	1¼	1½	1¾	2	2½
Price, per foot	\$0.65	.75	.93	1.13	1.31	1.50	1.88

Stock lengths: 25 and 50 feet only. Other lengths from factory. When ordering, give brand and inside diameter. Couplings are same as used on Water Hose and are charged extra. Not furnished unless ordered.

SUCTION HOSE NIPPLES



FIG. 1509

Size .....inches	2	2½	3	3½	4	4½	5	6	7	8	10	12
Price..... each	0.60	0.90	1.25	1.75	2.00	3.00	3.60	5.00	7.25	8.25	16.25	25.00
For wiring in "	1.70	1.80	1.90	1.20	2.50	2.60	2.75	3.75	4.25	4.75	5.75	6.50



FIG. 1510

DREDGING SLEEVES

Flexible connections between the sections of pipe used in conveying dredged material to the bank of a river, shore of a lake or other point of deposit calls for short pieces of special hose of large diameter. Our sleeves are strictly unique in several characteristics essential to highest success in this peculiar service.

PRICE LIST

Inside Diameter, inches	Price, Per Foot				Inside Diameter, inches	Price, Per Foot			
	6-ply	8-ply	10-ply	12-ply		6-ply	8-ply	10-ply	12-ply
12	\$9.00	\$12.00	\$15.00	\$18.00	25	\$18.75	\$25.00	\$31.25	\$37.50
13	9.75	13.00	16.25	19.50	26	19.50	26.00	32.50	39.00
14	10.50	14.00	17.50	21.00	27	20.25	27.00	33.75	40.50
15	11.25	15.00	18.75	22.50	28	21.00	28.00	35.00	42.00
16	12.00	16.00	20.00	24.00	29	21.75	29.00	36.25	43.50
17	12.75	17.00	21.25	25.50	30	22.50	30.00	37.50	45.00
18	13.50	18.00	22.50	27.00	31	23.25	31.00	38.75	46.50
19	14.25	19.00	23.75	28.50	32	24.00	32.00	40.00	48.00
20	15.00	20.00	25.00	30.00	33	24.75	33.00	41.25	49.50
21	15.75	21.00	26.25	31.50	34	25.50	34.00	42.50	51.00
22	16.50	22.00	27.50	33.00	35	26.25	35.00	43.75	52.50
23	17.25	23.00	18.75	34.50	36	27.00	36.00	45.00	54.00
24	18.00	24.00	30.00	36.00	.....	.....	.....	.....	.....

WIRE HOSE COVERING

Round Wire



FIG. 1511

Half Round



FIG. 1512

Flat Tinned



FIG. 1513

WINDING WATER HOSE, WITH ROUND
TINNED STEEL WIRE

Size	Per Ft. 3-Ply	Per Ft. 4-Ply	Per Ft. 5-Ply	Per Ft. 6-Ply
½ inch.....	\$0.03	.04	.05	.06
¾ inch.....	.04	.05	.06	.07
1 inch.....	.05	.07	.08	.09
1¼ inch.....	.07	.08	.09	.10
1½ inch.....	.08	.09	.10	.11
1¾ inch.....	.09	.10	.11	.12
2 inch.....	.10	.11	.12	.13
2¼ inch.....	.11	.12	.13	.14
2½ inch.....	.12	.13	.14	.15

WINDING STEAM AND AIR HOSE, WITH FLAT TINNED
OR HALF ROUND STEEL
WIRE

	Per Ft. 3-Ply	Per Ft. 4-Ply	Per Ft. 5-Ply	Per Ft. 6-Ply
½ inch.....	\$0.09	.10	.11	.12
¾ inch.....	.11	.12	.13	.14
1 inch.....	.13	.14	.15	.16
1¼ inch.....	.15	.16	.17	.18
1½ inch.....	.18	.19	.20	.21
1¾ inch.....	.20	.21	.22	.23
2 inch.....	.23	.24	.25	.26
2¼ inch.....	.25	.26	.27	.28
2½ inch.....	.27	.28	.29	.30

WINDING STEAM AND AIR HOSE, WITH ROUND TINNED
STEEL WIRE

Size	Per Foot 3-Ply	Per Foot 4-Ply	Per Foot 5-Ply	Per Foot 6-Ply	Per Foot 7-Ply	Per Foot 8-Ply
½ inch.....	\$0.06	.07	.08	.09	.10	.11
¾ inch.....	.07	.08	.09	.10	.11	.12
1 inch.....	.08	.09	.10	.11	.12	.13
1¼ inch.....	.09	.10	.11	.12	.13	.14
1½ inch.....	.10	.11	.12	.13	.14	.15
1¾ inch.....	.11	.12	.13	.14	.15	.16
2 inch.....	.13	.14	.15	.16	.17	.18
2¼ inch.....	.15	.16	.17	.18	.19	.20
2½ inch.....	.17	.18	.19	.20	.21	.22

WRAPPED MARLINE COVERING FOR STEAM AND AIR DRILL HOSE

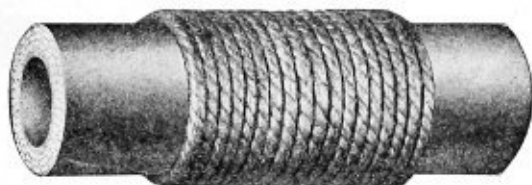


FIG. 1514

SIZE	3-ply	4-ply	5-ply	6-ply	8-ply
$\frac{1}{2}$ inch .....per ft.	\$0.03	.04	.05	.06	.08
$\frac{3}{4}$ inch .....per ft.	.04	.05	.06	.07	.09
1 inch .....per ft.	.05	.07	.08	.09	.11
$1\frac{1}{4}$ inch .....per ft.	.07	.08	.09	.10	.12
$1\frac{1}{2}$ inch .....per ft.	.08	.09	.10	.11	.13
$1\frac{3}{4}$ inch .....per ft.	.09	.10	.11	.12	.14
2 inch .....per ft.	.10	.11	.12	.13	.15
$2\frac{1}{4}$ inch .....per ft.	.11	.12	.13	.14	.16
$2\frac{1}{2}$ inch .....per ft.	.12	.13	.14	.15	.17

WOVEN COTTON COVERING FOR STEAM, SUCTION, AIR AND WATER HOSE, EITHER PAINTED OR PLAIN

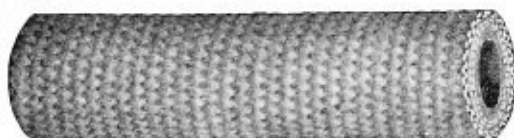


FIG. 1515

Outside Diameter	Painted	Plain	Outside Diameter	Painted	Plain
1 in.	.064 ft.	.058 ft.	$2\frac{1}{8}$ in.	.136 ft.	.122 ft.
$1\frac{1}{8}$ in.	.072 ft.	.065 ft.	$2\frac{1}{4}$ in.	.144 ft.	.129 ft.
$1\frac{1}{4}$ in.	.08 ft.	.072 ft.	$2\frac{3}{8}$ in.	.152 ft.	.137 ft.
$1\frac{3}{8}$ in.	.088 ft.	.08 ft.	$2\frac{1}{2}$ in.	.16 ft.	.144 ft.
$1\frac{1}{2}$ in.	.095 ft.	.087 ft.	$2\frac{5}{8}$ in.	.168 ft.	.151 ft.
$1\frac{5}{8}$ in.	.104 ft.	.094 ft.	$2\frac{3}{4}$ in.	.176 ft.	.158 ft.
$1\frac{3}{4}$ in.	.112 ft.	.10 ft.	$2\frac{7}{8}$ in.	.184 ft.	.166 ft.
$1\frac{7}{8}$ in.	.12 ft.	.108 ft.	3 in.	.19 ft.	.171 ft.
2 in.	.128 ft.	.115 ft.			

APPROXIMATE O.D'S OF STEAM AND AIR DRILL HOSE

O. D.	4-Ply	5-Ply	6-Ply	PNEUMATIC TOOL HOSE Size		
$\frac{3}{4}$ in.	$1\frac{1}{8}$ in.	$1\frac{1}{2}$ in.	$1\frac{1}{8}$ in.	$\frac{1}{2}$ in.	7-ply	$\frac{3}{8}$ in.
1 in.	$1\frac{1}{8}$ in.	$1\frac{3}{8}$ in.	$1\frac{1}{8}$ in.	$\frac{3}{4}$ in.	7-ply	$1\frac{1}{8}$ in.
$1\frac{1}{4}$ in.	$1\frac{1}{8}$ in.	2 in.	$2\frac{1}{8}$ in.	1 in.	7-ply	$1\frac{1}{8}$ in.
$1\frac{1}{2}$ in.	$2\frac{1}{8}$ in.	$2\frac{1}{4}$ in.	$2\frac{3}{8}$ in.	1 in.	9-ply	$1\frac{1}{2}$ in.

CORRUGATED NON-KINKING TENDER HOSE

For Use Between Engines and Tenders



FIG. 1516

"BESTOVALL"

Highest Possible Grade

Size	inches	1 1/4	2	2 1/4	2 1/2	2 3/4	3	3 1/2	4
List	per ft.	\$0.87	1.00	1.12	1.25	1.37	1.50	2.17	2.50

We make above to meet any railroad specifications.

AIR BRAKE AND AIR SIGNAL HOSE

Made to Meet M. C. B. or Any Railroad Specifications



FIG. 1517

Diameter	inches	1	1 1/4
50 ft. lengths	list, per ft.	\$0.87	1.04
22 in. lengths	list, per ft.	.87	1.04

Ends capped and enlarged.

"BESTOVALL" BOILER WASHOUT HOSE



FIG. 1518

Our Boiler Washout Hose has an internal tube capable of withstanding water varying in temperature from cold to boiling hot, also strains from extreme high pressure; a fabric body that is strong and durable, and an outer cover of extra wear-resisting properties to withstand the severe abrasion encountered in this service.

If you want a hose that will be efficient under the most exacting conditions of service, use BESTOVALL BRAND.

Size	inches	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2
4 ply	per foot	\$1.04	1.25	1.45	1.66	1.87	2.08
5 ply	per foot	1.30	1.56	1.81	2.07	2.33	2.60

MULCONROY FLEXIBLE METALLIC HOSE

AIR HOSE



FIG. 1519

Mulconroy Flexible Metallic Hose is not an ordinary wire-wrapped hose. It is entirely covered with a braiding of steel wires, which takes care of the internal pressure—1000 lbs. pressure cannot burst it.

Over this is an additional reinforcement of special hard steel spring wire, close wrapped, which protects the hose from outside abuse, such as dragging over rough surfaces, turning sharp corners and burning from hot rivets

and plates; it also protects the hands of the user.

It insures full capacity, because it prevents kinking and shutting off the supply of air; always stays round and therefore delivers the maximum quantity.

Size .....inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price .....per foot	\$0.33	.39	.46	.57	.81	1.16	1.32	1.80	2.50

WATER HOSE



FIG. 1520

WATER HOSE

Armored with a double cover of braided and half-round steel wire—for use where the hose is dragged over rough surfaces. Also for very heavy pressure.

Size .....inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3
Price .....per foot	\$0.61	.90	1.08	1.26	1.68	1.90	2.10	2.50

"DYNAMITE" STEAM HOSE



FIG. 1521

"DYNAMITE" STEAM HOSE

The special spiral wire reinforcement, running through the inside from end to end, holds the rubber tube intact, until its "life" is entirely gone. This absolutely prevents the buckling and collapsing which shortens the life and lessens the value of all steam hose which is not armored inside. It also prevents nipples or couplings injuring the tube when they are applied.

Size .....inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{2}$	3
Price .....per foot	\$0.90	1.10	1.40	1.60	1.85	2.50	3.00	4.00	5.00

MULCONROY "NEW PROCESS" HOSE

FOR HIGH PRESSURE AIR AND STEAM



FIG. 1522

The inside construction is the same as our Mulconroy Flexible Metallic Hose. For use where a metal covered hose is not adapted.

The covering is braided from hard twisted yarns treated with a peculiar elastic lubricant, which thoroughly impregnates and strenghtens every part, and protects the hose against heat, cold, oils, acids, alkalies, and other chemicals, and also against hard knocks and other outside abuse. Detailed information in folder No. 49.

Size	Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
New Process Steam Hose				.80	1.00	1.30	1.50	1.80	2.85	3.85	4.80
New Process Air Hose		.30	.35	.42	.62	.73	1.05	1.18	1.62	2.25	...

MULCONROY FLEXIBLE GAS MACHINE METALLIC HOSE



FIG. 1523

FOR WELDING, CUTTING AND BRAZING

The tube is compounded for this particular work, and guaranteed for long service.

Hose is made with red and black covers, to distinguish oxygen from gas supply.

Also made in single line.

Size ....inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$
Twin ...per ft.	\$0.60	.68	.72
Single ..per ft.	.30	.34	.36

The ends are left free (see cut), for any length desired, and these are also armored.

MULCONROY HIGH PRESSURE COUPLINGS

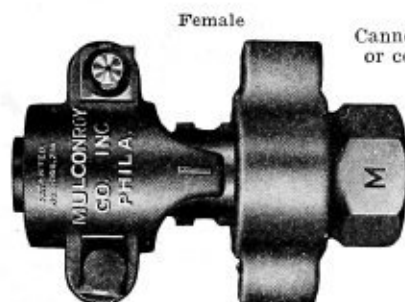


FIG. 1524

Cannot injure tube
or cover of hose.

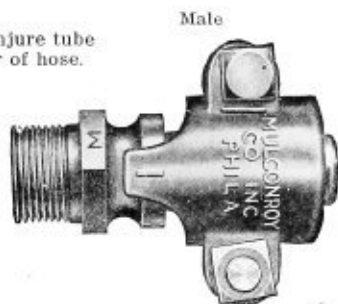


FIG. 1525

Mulconroy Couplings will not blow off under the highest pressure. They have been tested to 3,000 lbs. hydraulic pressure, and we have supplied them for a working pressure of 2,000 lbs. hydraulic and 200 lbs. steam.

All parts are made of extra heavy malleable iron.

Can be attached or detached in a few seconds, and will not injure tube or cover of hose.

Mulconroy Couplings will fit any regular hose. All threads are standard iron pipe. Separate parts can be furnished. See list.

MULCONROY MALE COUPLINGS in the smaller sizes are particularly adapted for use on Air Hose. No matter how high the pressure, or how much pulling, twisting, vibrating or rough handling is applied to the hose, these couplings will never blow off. Cut shows $\frac{1}{2}$ -inch Mulconroy Male Coupling with $\frac{1}{2}$ -inch thread, attached to Mulconroy Flexible Metallic Air Hose.



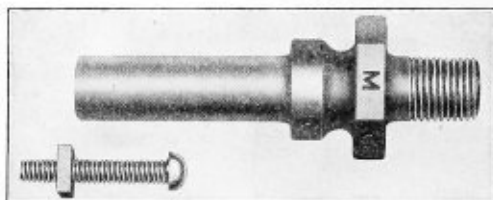
FIG. 1526

These couplings will fit any regular hose. All threads are standard iron pipe.

Size Inches	Female Coupling Complete	FEMALE				MALE			
		PARTS				Size Inches	Male Coupling Complete	PARTS	
		Spud	Nut	Stem	Clamp			Male Coupling Stems	Male Coupling Clamps
½	\$1.20	.20	.25	.40	.40	¾	\$0.75	.60	.15
¾	2.00	.50	.70	.50	.40	1½	1.00	.80	.20
1	2.00	.50	.70	.50	.40	¾	1.00	.80	.20
1¼	3.20	.60	1.30	.78	.58	1	1.00	.80	.20
1½	3.90	1.20	2.20	1.20	.80	1¼	1.25	1.00	.25
2	5.00	1.40	2.20	1.40	1.20	1½	1.50	1.20	.30
2½	11.00	3.00	3.50	3.00	3.00	2	2.00	1.60	.40

State size of thread desired. $\frac{3}{8}$ -inch Male Couplings made with $\frac{1}{4}$ -inch and $\frac{3}{8}$ -inch threads. $\frac{1}{2}$ -inch Male Couplings are made with $\frac{3}{8}$ and $\frac{1}{2}$ inch thread. $\frac{3}{4}$ -inch with $\frac{1}{2}$ and $\frac{3}{4}$ inch thread. When no size thread is given, we furnish $\frac{3}{8}$ -inch thread with $\frac{1}{2}$ -inch Male Couplings, and $\frac{1}{2}$ -inch thread with $\frac{3}{4}$ -inch. On other sizes, the size of the hose determines the thread of the couplings.

When ordering extra parts, state whether for Male or Female Couplings.

"MULCONROY" NIPPLES**FIG. 1527**

"Mulconroy" Nipples are particularly adapted for use on pneumatic hose.

No matter how high the pressure or how much pulling, twisting, vibrating or rough handling is applied to the hose, these Nipples will never blow off or injure the hose.

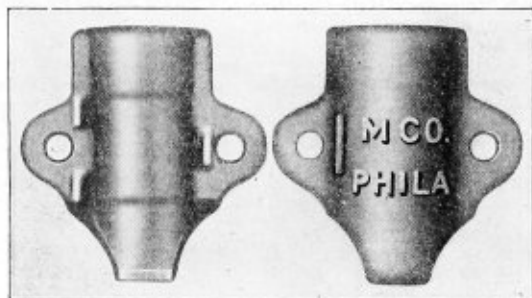
An important advantage is the large volume of air delivered. The ordinary Nipple used in a $\frac{3}{8}$ -inch hose has a $\frac{1}{2}$ -inch opening, and in a $\frac{1}{2}$ -inch hose a $\frac{1}{4}$ -inch opening. The "Mulconroy" Nipple has a larger opening than any other Nipple made.

They will fit any regular hose from $\frac{3}{8}$ -inch to 2 inches inclusive. The size of the hose determines the size of the Nipple.

HOW TO ORDER "MULCONROY" NIPPLES

State size of thread desired. $\frac{3}{8}$ -inch Nipples made with $\frac{1}{4}$ -inch and $\frac{3}{8}$ -inch threads. $\frac{1}{2}$ -inch Nipples are made with $\frac{1}{4}$ -inch, $\frac{3}{8}$ -inch, and $\frac{1}{2}$ -inch thread. $\frac{3}{4}$ -inch Nipples are made with $\frac{3}{8}$ -inch, $\frac{1}{2}$ -inch, and $\frac{3}{4}$ -inch thread. When no size thread is given, we furnish $\frac{3}{8}$ -inch thread with $\frac{1}{2}$ -inch Nipples, and $\frac{1}{2}$ -inch thread and $\frac{3}{4}$ -inch Nipples. 1-inch, $1\frac{1}{4}$ -inch, $1\frac{1}{2}$ -inch, and 2-inch Nipples are made regularly with 1-inch, $1\frac{1}{4}$ -inch, $1\frac{1}{2}$ -inch, and 2-inch thread respectively.

Clamps

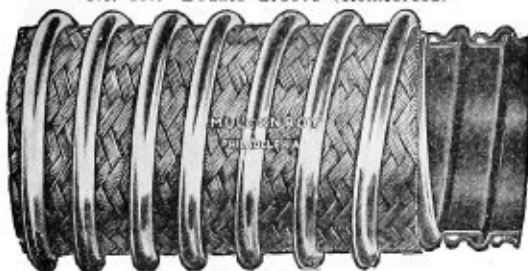
**FIG. 1528**

**SIZES AND PRICE LIST OF "MULCONROY" NIPPLES
(INCLUDING CLAMPS)**

Size in inches.....	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Size of Threads in inches..	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$				
Prices	\$0.75	1.00	1.00	1.00	1.25	1.50	2.00

MULCONROY ALL-METAL HOSE

No. 100, Double Groove (Reinforced)

**FIG. 1529**

The only all-metal hose which retains its flexibility under pressure. Each piece tested under high pressure before leaving factory. Guaranteed perfect in material and workmanship. Lacing and half-round wire reinforcement enable the hose to stand excessive pressure, and protect it from kinking, twisting and outside abuse. Fittings made of close texture brass, finished throughout, and attached so that no pressure can blow them off.

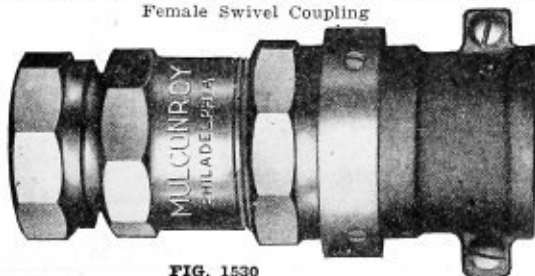
Specially adapted for steam at high pressure, oils, fats, grease, gas and chemicals, tar, paints and varnishes, marine work, oiling machinery, vacuum, conduit, etc.

DOUBLE GROOVE, bronze, reinforced with bronze or steel lacing, is best for all purposes. It should be used exclusively for high pressure steam, chemicals, gasoline, ammonia, marine work, and where the hose is dragged about and handled roughly.

DOUBLE GROOVE, steel, reinforced, is used for conveying oils, grease, fats, tar, paints and varnishes.

MULCONROY ALL-METAL HOSE COUPLINGS

Female Swivel Coupling

**FIG. 1530**

Couplings for Mulconroy All-Metal Steam Hose are made of extra heavy close-texture brass—in sizes 1 inch and under from bar stock, and in larger sizes from red brass castings.

They are screwed onto the hose, fitting into the grooves in such manner that it is impossible to blow them off, no matter what the pressure.

Packed with asbestos and red lead, which makes a perfect steam joint.

Furnished unless otherwise specified with standard iron pipe threads. Special threads can be supplied at short notice.

Size	inch	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2
Steel, Steel Laced	ft.	0.35	0.40	0.45	0.55	0.85	0.95	1.30	2.25
Bronze, Steel Laced	ft.	.56	.75	1.25	1.50	2.05	2.65	3.20	5.65
Bronze, Bronze Laced	ft.	.62	.83	1.38	1.65	2.26	2.92	3.52	6.22
Packed Couplings	set			3.35	4.00	5.60	7.50	10.00	13.35
Soldered Couplings	set	1.70		2.35	2.60	3.00	3.70	4.50	6.00

ALL-METAL HOSE

Auto-Steelflex



Auto-Brassflex

FIG. 1531

Conduits—Carburetor Tubing—Exhaust Tubing
List Prices, Auto-Steelflex and Auto-Brassflex Conduits

ASBESTOS PACKED, CORD PACKED, UNPACKED

Inside Diameter, Inches	List Price Per Foot	Outside Diameter, Inches	Approx. Ft. Per Coil	Approximate Wt. Per 1,000 Feet, Pounds
$\frac{1}{4}$	\$0.10	.343	250	77
$\frac{1}{2}$	.12	.406	250	97
$\frac{3}{8}$	.14	.468	250	115
$\frac{1}{2}$	.15	.546	200	130
$\frac{3}{4}$	.17	.609	200	160
$\frac{1}{2}$	.19	.750	200	200
$\frac{3}{4}$	.22	.906	125	220

Auto-Steelflex Carburetor Tubing

ASBESTOS PACKED, CORD PACKED, UNPACKED

$\frac{3}{4}$	.22	.906	125	220
$\frac{7}{8}$	.25	1.031	125	330
1	.30	1.156	100	400
$1\frac{1}{8}$	.34	1.282	100	470
$1\frac{1}{4}$	.40	1.406	50	520
$1\frac{1}{2}$	.43	1.469	50	540
$1\frac{3}{4}$	.46	1.532	50	590
$1\frac{1}{2}$	.52	1.656	50	650
$1\frac{3}{4}$	.60	1.906	50	720
2	.70	2.156	25	800
$2\frac{1}{4}$	.82	2.406	25	920
$2\frac{1}{2}$	.94	2.656	25	1030
$2\frac{3}{4}$	1.10	2.906	25	1250
3	1.25	3.156	25	1480

Auto-Steelflex Exhaust Tubing

ASBESTOS PACKED, UNPACKED

1	.65	1.250	Odd Lengths	750
$1\frac{1}{4}$	.80	1.500	"	880
$1\frac{1}{2}$	.95	1.750	"	1020
$1\frac{3}{4}$	1.12	2.000	"	1160
2	1.30	2.250	"	1330
$2\frac{1}{4}$	1.50	2.500	"	1510
$2\frac{1}{2}$	1.75	2.750	"	1756
$2\frac{3}{4}$	2.00	3.000	"	2056
3	2.35	3.250	"	2366

In ordering, specify Asbestos Packed, Cord Packed or Unpacked.

PURE GUM TUBING



FIG. 1532

All tubing is manufactured in 50 foot lengths, and unless otherwise specified packed in square boxes. Each box containing one length. Larger length furnished when requested.

"ARAP" brand is a high grade white tubing, elastic and durable, adapted for druggist sundry trade, and all high grade purposes.

Price per pound.....\$1.00

"STERLING" brand is a white tubing of excellent quality, used largely for hardware and plumbing trade and for natural gas and all purposes when a good grade of white tubing can be used.

Price per pound.....

"No. 1602" Red is a high grade lamp tubing for acetylene gas, high grade spray and syringe use and laboratory work.

Price per pound.....

"No. 1178" Red is a good grade of tubing for natural gas and general use.

Price per pound.....

CLOTH INSERTION TUBING

This tubing is commonly used for air, gas, beer pumps and hand spray purposes.

Made with either black or red covers.

List price for three-ply.

$\frac{1}{8}$ inch internal diameter.....	per ft.	\$0.10
$\frac{3}{16}$ inch internal diameter.....	per ft.	.14
$\frac{1}{4}$ inch internal diameter.....	per ft.	.18
$\frac{5}{16}$ inch internal diameter.....	per ft.	.20
$\frac{3}{8}$ inch internal diameter.....	per ft.	.23
$\frac{1}{2}$ inch internal diameter.....	per ft.	.28

Other plies quoted on application.

GARDEN HOSE COUPLINGS

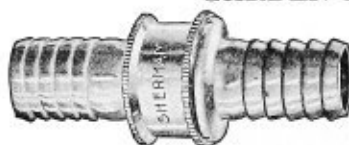


FIG. 1533

SPUN BRASS

 $\frac{1}{2}$ inch.....Price per dozen \$2.40 $\frac{3}{4}$ inch.....Price per dozen 2.40

WATER HOSE COUPLINGS

CAST BRASS

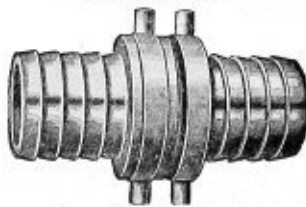


FIG. 1534

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Hose pipe thread.....list per doz.		\$2.40	2.40	4.40	10.00	14.00	24.00	48.00	75.00
Iron pipe thread.....list per doz.		2.65	2.65	4.65	10.50	15.00	26.00	50.00	76.00
Size	inches	$3\frac{1}{2}$	4	5	6	8			
Iron pipe thread.....list per doz.		\$120.00	150.00	250.00	500.00	600.00			

NOTE.—Couplings with hose pipe thread will always be sent if not otherwise ordered. $3\frac{1}{2}$ to 8-inch, inclusive, are made with iron pipe thread unless otherwise ordered.

STEAM HOSE COUPLINGS



FIG. 1535

Size	inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Hose pipe thread.....list per doz.		\$15.00	15.00	18.00	24.00	30.00	42.00	72.00

HOSE MENDERS

Cooper

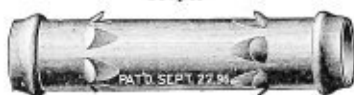


FIG. 1536

COOPER

Sherman



FIG. 1537

Made of solid brass, with concave teeth, precluding possibility of pulling out when once inserted.

Priceper dozen \$1.20

SHERMAN

Size	in.	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
List	per doz.	\$1.20	1.20	1.20
No. in box		100	100	100

QUICK-AS-WINK HOSE COUPLERS



FIG. 1538

To connect, push the parts together.

The joint is tight under any pressure the hose will stand, yet it swivels, easing the hose and the handling.

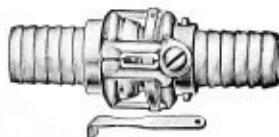


FIG. 1540

To disconnect, insert key in slot and give a quarter turn, or, pinch the thumb-levers, and pull apart—as the case may be.



FIG. 1541



Key

FIG. 1539

Write for Pamphlet No. 5, describing Air, Steam or Gas Hose Couplings.

Pamphlet No. 6, describing Water Hose Couplings for ordinary use on lawns, gardens, etc.

Pamphlet No. 7, for Fire or Suction Hose Couplings.

Each of these pamphlets gives complete description of parts, with letter name, size and price of each part, enabling the user to designate exactly what he requires. The illustrations below show location on hose of the parts most used.

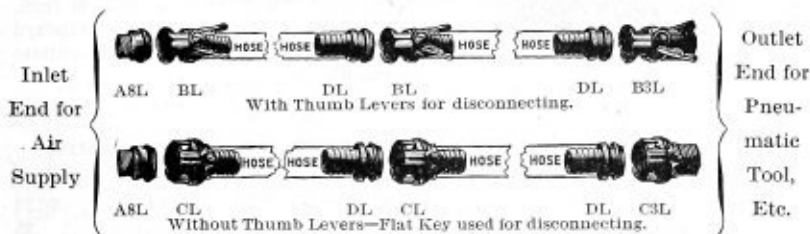


FIG. 1542

THE WINNING FEATURES OF THIS COUPLER ARE

Time Saving—Connections are made or broken in one second.

Reliability—There is no balking on account of grit, mud, etc. They will hold—till you uncouple them; when once the jaws have snapped over the shouldered groove there is no separating them till you open them again with the thumb-levers or the key, as preferred. The greater the pressure inside, the tighter they hold.

Endurance—The parts are strong, simple, self-cleaning. Will work even if much battered and flattened. If too much crushed out of shape, almost any one can bump them into working order again.

Convenience—One part swivels upon the other, letting the twist out of the hose and making the handling easy.

Hose-Saving—It is easier to disconnect a short section of hose, move and connect it elsewhere than to handle a long section—and cheaper.

THE BOWES AUTOMATIC AIR-HOSE COUPLING

The Bowes Coupling is provided with a groove to admit use of the "Never-Slip" Hose Clamp. The coupling is absolutely tight under all pressures and is connected or disconnected by a quarter turn.



FIG. 1543

Above cut shows application of "Never-Slip" Clamp to the "Bowes" Hose Coupling.

"Never-Slip" Hose Clamps for "Bowes" Hose Couplings and Cleveland Hose Nipples are made in the following sizes. $\frac{3}{8}$ inch, $\frac{1}{2}$ inch, $\frac{3}{4}$ inch, 1 inch, $1\frac{1}{4}$ inch and $1\frac{1}{2}$ inch.



FIG. 1544



FIG. 1545

We also furnish double "Never-Slip" Clamps for use with Stock Hose Menders in the following sizes: $\frac{1}{2}$ inch, $\frac{3}{4}$ inch, 1 inch. We carry at all times standard sizes of "Hose Menders" for immediate shipment.

BOWES AIR HOSE COUPLINGS

Grooved for Never-Slip Clamps

Size	Each
$\frac{1}{4}$ to $\frac{3}{4}$ inch female hose or pipe ends	\$0.80
$\frac{1}{4}$ to $\frac{3}{4}$ inch male hose or pipe ends	1.00
1 and $1\frac{1}{4}$ inch female hose or pipe ends	1.50
1 and $1\frac{1}{4}$ inch male hose or pipe ends	2.00
$1\frac{1}{2}$ inch female hose or pipe ends	2.50
$1\frac{1}{2}$ inch male hose or pipe ends	3.50

NEVER-SLIP HOSE MENDER CLAMPS

Size	Each
$\frac{1}{2}$ inch	\$0.30
$\frac{3}{4}$ inch	.40
1 inch	.50

NEVER-SLIP HOSE CLAMPS

Size	Each
$\frac{3}{8}$ inch	\$0.20
$\frac{7}{16}$ inch	.25
$\frac{1}{2}$ inch	.25
$\frac{5}{8}$ inch	.30
$\frac{3}{4}$ inch	.30
1 inch	.40
$1\frac{1}{4}$ inch	.50
$1\frac{1}{2}$ inch	.75

WOLF STEAM HOSE COUPLINGS



FIG. 1546

This coupling will not leak or blow out under any pressure. At the point of greatest tendency to leak, where the coupling is clamped to the hose, are wedge-shaped pieces that serve the double purpose of squeezing the hose tightly against the coupling and of holding it in such manner that it is impossible for it to blow out.

The Wolf is easily applied, the only tool required being a wrench.

The clamps are of malleable iron, the bolts of the best Swedish iron, and the other parts of the coupling are of brass.

Size	inch	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
List price.....	per set	\$1.70	2.00	2.50	3.00	4.00	6.00

WOLF AIR DRILL HOSE COUPLINGS



FIG. 1547

This is a strong, heavy coupling made especially for rough work in mines or quarries, although it is adapted as well for use with air tools.

The plugs are made interchangeable, so that different sizes of hose may be connected.

Size	inch	$\frac{3}{4}$	1	$1\frac{1}{4}$
List price	each	\$2.50	4.00	5.00
Extra spuds	each	1.00	1.00	1.00

"PITTSBURGH" ALL BRASS AIR DRILL HOSE COUPLINGS



FIG. 1548

The advantages of the Pittsburgh Coupling over other makes is that it is heavier and stronger throughout. It has a double swivel, which allows the hose to turn without cutting off the air. The reducing spud permits the use of $1\frac{1}{4}$ coupling with 1 inch hose.

Size hose	in.	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
List	set	\$5.00	5.50	7.00	9.00	11.00	14.00

KNOX HOSE COUPLINGS

Adapted for steam and drill service

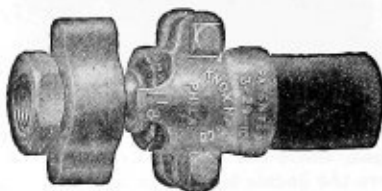


FIG. 1549

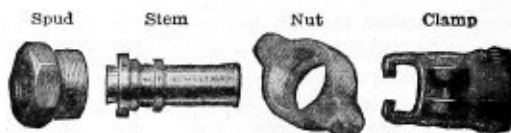


FIG. 1550

PRICE LIST

Size	inches	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Each		\$1.25	1.70	2.00	2.00	3.00	3.50	5.00	8.75	11.25

We can furnish without additional charge a special size clamp known as $1\frac{1}{8}$ -inch for 1-inch hose with exceptionally heavy wall or cotton woven cover.

KNOX THROTTLE VALVES

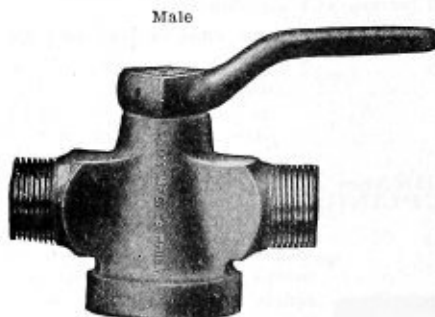


FIG. 1551

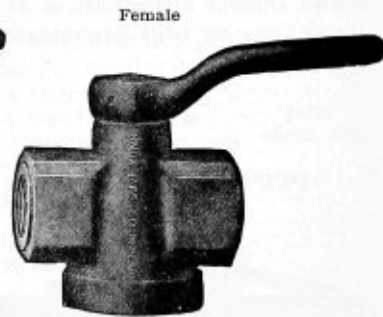


FIG. 1552

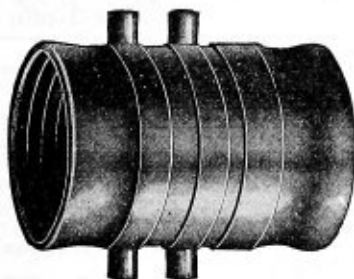
$\frac{3}{4}$ -inch malleable throttle valves	each, \$3.75
1 -inch malleable throttle valves	each, 4.40

The above valves are used in air drill service to shut off or turn on air quickly at any intermediate point.

"MILL" EXPANSION RING COUPLINGS**FIG. 1553**

The "Mill" Coupling is made for Cotton Rubber lined Mill Hose and Unlined Linen Hose in sizes $1\frac{1}{4}$, $1\frac{1}{2}$, 2 and $2\frac{1}{2}$ inches.

We furnish free with each set two Expansion Rings and a Rubber Washer.

UNDERWRITER'S EXPANSION RING COUPLING**FIG. 1554**

Made in conformity to the requirements of the Inspection Department of the Associated Factory Mutual Fire Insurance Companies, in $2\frac{1}{2}$ -inch size only for linen and cotton hose.

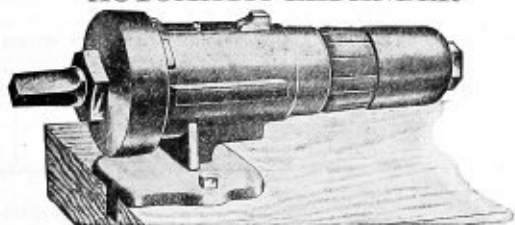
INSTRUCTIONS FOR ORDERING

First: Give exact outside diameter of hose. It is always better to send samples of hose when possible. Also state if a rubber capper is used on cotton or linen hose. If capper is used, hose should not be as tight a fit.

Second: We must have sample thread by which to cut thread on the couplings; a description of the thread will not do unless it is iron pipe or hose thread.

EXPANSION RINGS FOR AUTOMATIC COUPLINGS**FIG. 1555**

All sizes—
Per dozen\$3.00

AUTOMATIC EXPANDER**FIG. 1556**

Size	inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price	each	\$20.00	\$20.00	\$20.00
Extra Cutters	per set of two	2.50	2.50	2.50



U. S. PATENTS.
Nos. 477,237, 480,513, 480,514, 480,515,
615,322 AND CANADIAN PATENT No 44,081.

FIG. 1557

SURE GRIP HOSE CLAMPS HYDRANT HOSE CLAMPS

Size Hose, Inches	Ply	Per Doz.
1/8	2 and 3	\$1.00
1/4	2, 3, 4 and 5	1.00
3/8	2, 3, 4 " 5	1.00
1/2	2, 3, 4 " 5	1.50
3/4	3, 4 and 5	2.50
1	3, 4 " 5	3.00
1 1/4	3, 4 " 5	4.00
1 1/2	1, 3, 4 and 5	5.50
2	3, 4 and 5	7.00
2 1/4	4	8.50
2 1/2	3, 4 and 6	10.00

STEAM HOSE CLAMPS

Size of Hose, Inches	Ply	Per Doz.	Size of Hose, Inches	Ply	Per Doz.
1/2	3, 4, 5 and 6	\$1.00	1 1/4	3, 4, 5 and 6	\$3.00
3/4	3, 4 and 5	1.50	1 1/2	3, 4, 5 " 6	3.50
1	6	2.00	2	4, 5 and 6	5.50
1 1/4	3, 4, 5 and 6	2.50	2 1/4	4, 5 " 6	7.00

COTTON MILL HOSE CLAMPS

THESE ARE EXTRA LIGHT AND FLEXIBLE AND ARE MADE ESPECIALLY FOR THIS CLASS OF HOSE

Size Hose, Inches	Ply	Inside Diameter when Clamp is Open 1/2 Inch Between Ears	Dozen in a Box	Per Dozen
1 1/4		1 1/2	3	\$2.00
1 1/2		1 3/4	3	2.50
2		2 1/4	2	3.50

SUCTION AND TANK HOSE CLAMPS

On Clamps for Hose larger than the three-inch inside bore, it seems to be impossible to properly gage them by plys, so on our larger sizes we are listing all clamps larger than three-inch six-ply Hydrant by the INSIDE DIAMETER of the clamp, which we trust will be found a convenience in properly fitting Suction Hose.

Inside Diameter of Clamp inches	3 3/8	4	4 1/8	4 1/4	4 3/8	4 1/2	4 5/8	4 3/4	4 7/8	5
Per Dozen	\$11.00	11.25	12.50	13.75	14.00	15.25	16.00	16.75	17.50	18.25

DOUBLE HOSE CLAMPS

FOR USE WITH HOSE SPLICES. ONE CLAMP DOES THE WORK OF TWO

Size Hose In.	Ply	Inside Diameter When Clamp Is Open 1/2-Inch Between Ears	Dozen in a Box	Per Dozen
1 1/2	3	7/8	3	\$1.80
3/4	3	1 1/8	3	1.80

SHERMAN HOSE CLAMPS OR BANDS



FIG. 1559

For Attaching Couplings, Menders,
Etc.

Vise jaws should be used in at-
taching.

VISE JAWS

For Use on Any Kind of Vise.

Stock number . . . 1 2

For clamps...in. $\frac{1}{2}$ to $1\frac{1}{2}$ $1\frac{1}{2}$ to 3

Listeach \$0.70 1.00



FIG. 1560

SIZES OF LAWN HOSE CLAMPS

Size Hose .....inches	$\frac{3}{8}$ -3	$\frac{1}{4}$ -3	$\frac{3}{8}$ -2	$\frac{3}{8}$ -3	$\frac{1}{2}$ -2	$\frac{1}{2}$ -3	$\frac{1}{2}$ -4	$\frac{3}{4}$ -2	$\frac{3}{4}$ -3	$\frac{3}{4}$ -4
Inside Diameter, open..in.	$\frac{7}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{7}{8}$	$\frac{5}{8}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{3}{4}$
Gross in Box.....	1	1	1	1	1	1	1	1	1	1

Lawn Hose Clamps are sold at net price per dozen.

PRICE LIST AND SIZES OF WATER HOSE CLAMPS

Size Hose.....in.	1-2	1-3	1-4	$1\frac{1}{4}$ -3	$1\frac{1}{4}$ -4	$1\frac{1}{2}$ -3	$1\frac{1}{2}$ -4	2-3-4	2 $\frac{1}{2}$ -3-4	2 $\frac{1}{2}$ -3-4	3-3-4
Inside Diam.....in.	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$2\frac{1}{8}$	$2\frac{1}{8}$	$2\frac{3}{8}$	$3\frac{1}{8}$	$3\frac{5}{8}$
Gross in Box.....	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
List Price...per doz.	\$2.00	2.00	2.00	2.50	2.00	3.00	3.00	4.00	6.50	7.00	10.00

PRICE LIST AND SIZES OF STEAM HOSE CLAMPS

Size Hose.....in.	$\frac{3}{4}$ -3	$\frac{3}{4}$ -4	1-3	1-4	$1\frac{1}{2}$ -3	$1\frac{1}{2}$ -4	$1\frac{1}{2}$ -3-4	$1\frac{1}{2}$ -5	2-3-4	2-5	$2\frac{1}{2}$ -3-4	$2\frac{1}{2}$ -5
Inside Diam., Open.....in.	$1\frac{7}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{3}{8}$	$2\frac{1}{2}$	$3\frac{1}{4}$	$3\frac{5}{8}$
Gross in Box.....	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
List Price...per doz.	\$2.00	2.00	2.50	2.50	3.00	3.00	3.00	4.00	5.50	6.50	8.50	9.50

RULE FOR SELECTING PROPER SIZE CLAMPS

The inside diameter of the hose clamp should be $\frac{1}{2}$ inch larger than the outside diameter of the hose. To select the proper clamp, this rule should be followed as closely as range of sizes permits.



FIG. 1561

"SHERMAN" DOUBLE HOSE CLAMPS

Stock No.	D1	D2
Size Hose, In.	1/2	3/4
List, Per Dozen	...	...

DOUBLE BOLT SUCTION CLAMPS

For Suction, Water and Steam Hose, 3 Inches and Larger
For Suction Hose Under 3 Inches, Use Water or Steam Hose Clamp.

When ordering this style clamp, outside diameter of hose should be given when possible.

Stock No.	DB3	DB3 1/2	DB4	DB4 1/2	DB5	DB6	DB8
Size, Hose, Inches ...	3	3 1/2	4	4 1/2	5	6	8
Inside Clamp, Inches ...	4	4 1/2	5	5 1/2	6	7	9
List, Dozen	\$11.25	15.25	18.25	21.25	24.25	32.00	48.00

Packed one in a box. Intermediate sizes can be shipped promptly.



FIG. 1562

WATER THIEVES

Sometimes Known as Royle Attachments

Permits attaching a hose when hose bibb or sill cock is not available. May be attached to plain bibb or faucet without the aid of a screwdriver or other tool, and will hold fast. Particularly useful with water power washing machines.

Heavy cast brass throughout, carefully finished.

Made in two sizes to fit 1/2-inch and 5/8-inch bibbs, 3/4-inch hose thread.

Prices net per dozen.



FIG. 1563

COMMON HOSE SPANNER



FIG. 1564

Figure No.	S-1	S-2	S-3
Size	1 1/2 inches	2	2 1/2
List,	per dozen	...	...

TWO-EYED SPANNER

REVERSIBLE SPANNER



FIG. 1565

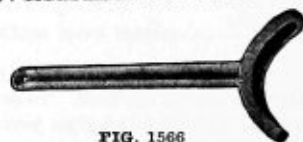


FIG. 1566

The Two-eyed and Reversible Spanners made in 2 1/2-inch size only. Prices upon application.

CALDWELL HOSE STRAPS AND PLIERS

Straps

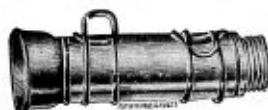


FIG. 1567

Plier

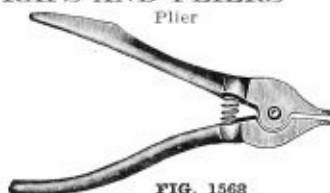


FIG. 1568

CALDWELL HOSE STRAPS

This style strap is used frequently for attaching $\frac{1}{2}$ and $\frac{3}{4}$ inch hose. We do not recommend the larger sizes for anything except very light work.

Stock No.	2	4	6	8	10	12	14	16	18
List .....per dozen	\$0.40	.40	.60	.60	.80	.80	1.00	1.00	1.20
Size Hose .....inches	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	1	1	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$
Length of Strap.....	$3\frac{3}{8}$	$3\frac{3}{4}$	$4\frac{1}{8}$	$4\frac{1}{2}$	5	$5\frac{5}{8}$	6	$6\frac{3}{8}$	$6\frac{3}{4}$

Stock No.	20	22	24	26	28	30	32	34	36
List .....per dozen	\$1.20	1.40	1.40	1.60	1.60	1.80	1.80	2.00	2.00
Size Hose .....inches	$1\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{3}{4}$	2	2	$2\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{1}{2}$
Length of Strap.....	$7\frac{1}{8}$	$7\frac{1}{2}$	8	$8\frac{1}{2}$	9	$9\frac{1}{2}$	10	$10\frac{1}{2}$	11

PLIERS FOR ATTACHING CALDWELL HOSE STRAPS

Size Hose	inches	$\frac{1}{2}$ and $\frac{3}{4}$	$1\frac{1}{4}$ to $1\frac{1}{2}$
List	per dozen	\$1.80	3.60

ROSE SPRINKLERS

2-inch face, $\frac{3}{8}$ -inch I. P. thread to replace tip on $\frac{3}{4}$ -inch and 1-inch Screw Tip or C. L. E. pipes. Made of heavy sheet brass throughout.

$2\frac{1}{2}$ -inch face with $\frac{3}{4}$ -inch Hose Thread, to go directly on hose. Made of heavy sheet brass throughout. Bulging face.

3-inch face, $\frac{3}{4}$ -inch Hose Thread, for attaching direct to hose. Cast brass body, heavy sheet brass face.

4-inch face, $\frac{3}{4}$ -inch Hose Thread, for attaching direct to hose. Cast brass body, heavy sheet brass face.

All Rose Sprinklers sold net price per dozen.



FIG. 1569



FIG. 1570

SUCTION STRAINER

Heavy cast brass throughout, carefully finished. Holes are drilled, making them smooth and clean.

Size	inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6
Price	each	\$7.50	7.50	8.50	10.00	15.00	19.00	25.00	31.00	46.00

HOSE WASHERS

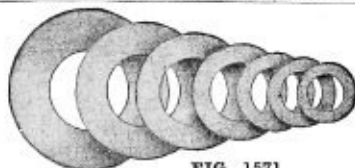


FIG. 1571

Size Hose.....inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{2}$	3
List .....per 100	\$0.80	1.00	1.20	1.50	1.75	2.25	3.00	4.50	6.00	9.75	13.00

BOSTON SPRAY NOZZLE



FIG. 1578

This is unquestionably the best combination spray nozzle on the market today. It is made of but three parts, all of which are made to gages on automatic machines, thus ensuring perfect uniformity and adjustment.

This nozzle is solidly made of fine cast brass, being extra heavy at the outlet to withstand the severe knocks caused by dropping the hose on stone or brick walks. It has a large barrel, thus enabling the stream of water to form before leaving the orifice. The special point in its favor is that it is easily and quickly regulated, a simple turn of the wrist changing the straight full stream to a coarse shower, to a fine spray, or to a finer mist. The shut-off is complete.

Being simple and strong in construction, the BOSTON SPRAY will not wear out or get out of order. EVERY NOZZLE IS TESTED before it leaves the shop. Packed in paper boxes containing one dozen.

We offer the BOSTON SPRAY in four styles, one is a combination of the $\frac{3}{4}$ inch and 1 inch, but which is, in reality, the 1 inch nozzle with a $\frac{3}{4}$ inch thread made especially to give a large volume of water quickly. Another is our special light pattern 1 inch nozzle which is the $\frac{3}{4}$ inch size with a 1 inch thread.

$\frac{3}{4}$ inch	per dozen	\$ 6.00
$\frac{3}{4}$ inch Mammoth Pattern	per dozen	12.00
1 inch Regular Heavy Pattern	per dozen	12.00
1 inch Special Light Pattern.....	per dozen	8.00

FAIRY NOZZLE



FIG. 1579

Made with screw tip and shut-off cock. It is of cast brass, heavy, and finely finished. This nozzle gives a smooth, free waterway for the solid stream, and throws as much water when spraying as when throwing the solid stream, thus saving time and causing less strain on the hose.

The spirally-cut plug, like the bore of a rifle, gives a twist to the stream, throwing it further and with a more effective spray than is obtainable with other styles of nozzles. Particular attention is given to the finish of the nozzles, each plug being ground to make a perfectly water-tight shut-off. Packed in pasteboard boxes, containing one dozen each.

$\frac{3}{4}$ inch only.....	per dozen	\$7.80
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PLAIN HOSE NOZZLES



FIG. 1580

Our Hose Nozzles are carefully designed, putting the strength in the right place and improving appearance. We have not reduced our weights to meet modern competition, but furnish the same standard weight and beautifully finished nozzles that we have always done.

Size	inches	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	1	1	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$
Length	inches	3	4	6	4	8	$4\frac{3}{4}$	10	12	$5\frac{3}{4}$
*List	per dozen	\$ 4.00	5.00	7.00	5.00	9.00	12.00	16.00	18.00	18.00
Size	inches	$1\frac{1}{2}$	$1\frac{1}{2}$	2	2	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	.....
Length	inches	10	12	$6\frac{3}{4}$	12	$7\frac{1}{2}$	12	15	20	.....
*List	per dozen	\$20.00	22.00	26.00	34.00	37.40	55.00	65.00	90.00	.....

$\frac{3}{4}$ and 1 inch sizes packed in cartons.

SCREW TIP HOSE PIPE

Substantially proportioned, beautifully finished. Weight and quality have not been sacrificed to meet competition.



FIG. 1581

Size	inches	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	1	1	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$
Length	inches	6	$7\frac{1}{2}$	12	$8\frac{1}{2}$	$12\frac{1}{2}$	12	15	13	15
*List	per doz.	\$ 7.00	8.00	10.00	10.00	12.00	20.00	24.00	25.00	30.00
Size	inches	$1\frac{1}{2}$	2	2	2	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$
Length	inches	20	12	15	20	15	20	24	30	36
*List	per doz.	\$36.00	38.00	45.00	50.00	75.00	96.00	100.00	144.00	157.00

$\frac{3}{4}$ and 1 inch sizes packed in cartons.

Threads on tips of all $\frac{3}{4}$ and 1 inch pipes are $\frac{3}{8}$ inch Iron Pipe size.

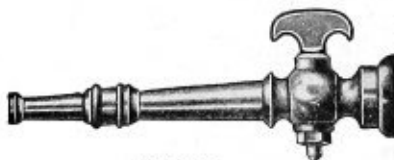


FIG. 1582

HOSE PIPES WITH COCKS

(C. L. E. PIPES)

Of the same substantial quality and weight and fine appearance as our other types of nozzle.

Size	inches	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	1	1	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$
Length	inches	$6\frac{3}{4}$	8	12	8	12	12	15	12	15
*List	per doz.	\$11.00	13.00	18.00	15.00	20.00	40.00	50.00	55.00	65.00
Size	inches	2	2	2	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$
Length	inches	12	20	25	12	15	20	24	30	36
*List	per doz.	\$80.00	110.00	130.00	145.00	155.00	160.00	175.00	195.00	215.00

1x8 and smaller sizes packed in cartons.

Threads on tips of all $\frac{3}{4}$ and 1 inch pipes are $\frac{3}{8}$ inch Iron Pipe size.

*Important Note. In ordering hose nozzles larger than 1 inch, it is necessary to specify whether Hose or Iron Pipe Thread is wanted, and if $2\frac{1}{2}$ inch size, whether regular Hose Thread or Fire Department Thread.

UNDERWRITERS' HOSE PIPE



FIG. 1583

The best style of pipe for mill use is the Underwriter—made in conformity with the requirements of the Associated Factory Mutual Fire Insurance Companies. It has a seamless copper tube, firmly attached to the mountings, is wound with marline, and painted red. It has swivel handles.

The word Underwriter is stamped in black on the red paint, together with our name and the date of manufacture. This pipe is well finished, and is an ornament to any office building.

Standard outlet, 1½ inch. Outlet ¾ inch, ¾ inch, 1 inch, or 1¼ inch as specified. 2½ inch butt, 30 inches long.....each \$20.00

LEATHER COVERED HOSE PIPE



FIG. 1584

A brass tube pipe, made with straight barrel, covered with heavy leather firmly riveted. This pipe has large leather handles, through which the arm may be thrust, thus allowing free use of both hands.

2½ inch butt, 20 inches long.....\$24.00

SWIVEL HANDLE PLAY PIPES



FIG. 1585

Screw Tip, Swivel Handle, and either wound and painted or plain brass tube.

Same general construction and design as Underwriter Pipe, but covers range of sizes not included in Underwriters' specifications.

Size	2	2½	2½	2½
Length	20	24	30	36
Wound and Painted.....	each \$9.00	11.00	See note	15.00
Plain Brass	each 7.50	9.50	11.00	13.50

Note—For the 2½x30 use the Underwriter Pipe.

SILL COCKS

With Wheel

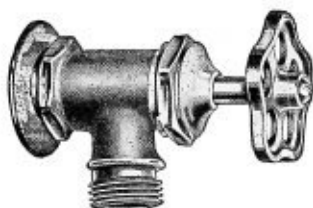


FIG. 1586

With Key

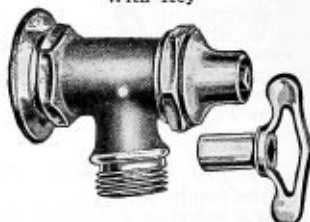


FIG. 1587

$\frac{1}{2}$ -inch and $\frac{3}{4}$ -inch connection.

Size	inch	$\frac{1}{2}$	$\frac{3}{4}$
With Wheel	per dozen	\$ 9.00	\$ 9.00
With Key	per dozen	10.00	10.00

SIAMESE CONNECTIONS



FIG. 1588

By the use of Siamese No. 27 one stream can be divided into two. No. 28 is used to combine two streams into one. Neither of these Siamese have interior valves. If valve is desired we recommend some one of our other forms. We have patterns for various combinations of sizes for both No. 27 and No. 28.



FIG. 1589

LIST PRICES, SIAMESE, NO. 27 AND NO. 28
ROUGH FINISH

$1\frac{1}{2}$ x $1\frac{1}{2}$ x $2\frac{1}{2}$ inches.....	each	\$ 9.50
$2\frac{1}{2}$ x $2\frac{1}{2}$ x $2\frac{1}{2}$ inches.....	each	9.50
$2\frac{1}{2}$ x $2\frac{1}{2}$ x 3 inches.....	each	10.00
$2\frac{1}{2}$ x $2\frac{1}{2}$ x $3\frac{1}{2}$ inches.....	each	12.00
$2\frac{1}{2}$ x $2\frac{1}{2}$ x 4 inches.....	each	12.00

Net extra for polishing, \$1.00 each.

NO. 222

This is the Siamese part of No. 222 Siamese, made of bronze, extra heavy, with two concealed independent automatic check valves. Can be furnished in 4 inch x $2\frac{1}{2}$ inch and 3 inch x $2\frac{1}{2}$ inch.



FIG. 1590

LIST PRICES SIAMESE, NO. 222—ROUGH FINISH

$2\frac{1}{2}$ x $2\frac{1}{2}$ x 4 inches.....	each	\$20.00
---	------	---------

Net extra for polishing, \$1.00 each.

LAWN SPRINKLERS

"Zenith"



No. 1591

"Pluvius"



FIG. 1592

"California"
Height, 11 inches

No. 1593

"Blake"



No. 1594

"Ring"



FIG. 1595

"Evanston"



FIG. 1596

Name	Height, In.	Body	Arms	Wt., Lbs.	List Doz.
ZENITH	5	Green	Brass	30	\$12.00
PLUVIUS	11	Red	Brass	40	16.00
CALIFORNIA	12	Red	Brass	53	19.00
BLAKE	3½	Galvanized	.....	8	4.00
RING	1½	Brass	.....	11	7.00
EVANSTON	2¼	Japanned	.....	23	4.80

GARDEN HOSE REELS

WIRT'S "VICTOR" GARDEN HOSE REEL

Is constructed with channel steel frame, strong, cast iron wheels, solid steel reel arms and 9 inch drum of heavy corrugated steel. Equipped with a ring on side of frame to prevent, when desired, the reel from unwinding; and with holder at top of frame for holding nozzle when spraying.

Frame enameled green, wheels and reel black, making a very attractive appearance.

Weight 12½ lbs., bundled for shipping.

Capacity 100 ft. of ¾ in. rubber hose.

Price, \$1.60.

WIRT'S "LIBERTY" REEL

Is constructed the same as Wirt's "Victor" Reel except that it is equipped with a crank for winding on the hose.

Weight 13 lbs., bundled for shipping.

Capacity 100 ft. of ¾ in. rubber hose.

Price, \$1.90.

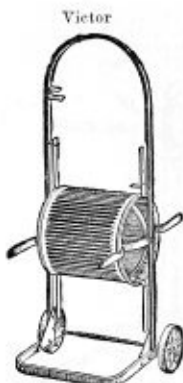


FIG. 1597

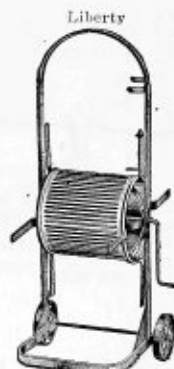


FIG. 1598

TUBULAR ALL METAL GARDEN HOSE REELS
STYLE B

Nos. 10 and 20

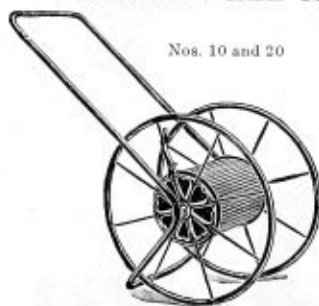


FIG. 1599

Nos. 30, 35 and 40

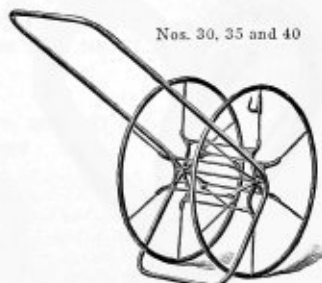


FIG. 1600

Nos. 10 and 20 have corrugated drums.

For lawn or garden. Very simple in construction, easily manipulated and the most durable Reel made.

Number of reel	10	20	30	35	40
Height of reel in inches	21	24	29	32	34
Weight of reel in lbs., bundled for shipping	18	20	35	52	80
Capacity of 3-ply ¾-inch rubber hose	100 ft.	150 ft.	400 ft.	600 ft.	800 ft.
" " 4 " 1 " " " "	50 ft.	75 ft.	150 ft.	200 ft.	300 ft.
" " 1¼-inch cotton rubber lined hose	100 ft.	150 ft.	200 ft.	350 ft.	500 ft.
" " 1½ " " " " "	75 ft.	150 ft.	250 ft.	400 ft.	400 ft.
" " 2 " " " " "	100 ft.	200 ft.	300 ft.	300 ft.	300 ft.
Price	\$3.50	\$4.00	\$6.50	\$12.00	\$25.00

WAREHOUSE HOSE REEL STYLE D

For mills, factories, warehouses, railroads, etc. Tubular reel and frame, steel wheels. A good, strong, compact, serviceable reel.

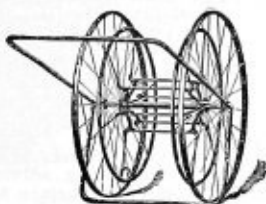


FIG. 1601

Number of reel	41	51	61
Height of wheels in inches...	42	48	52
Extreme width over all...in.	38	46	52
Weight of reel in pounds, bundled for shipping.....	150	185	200
Capacity of 1½-inch 4-ply rubber hose	250	400	500
Capacity of 2-inch 4-ply rubber hose	200	300	400
Capacity of 2½-inch 4-ply rubber hose	150	250	300
Capacity of 1½-inch cotton rubber-lined hose	500	650	800
Capacity of 2-inch cotton rubber- lined hose	350	500	600
Capacity of 2½-inch cotton rubber-lined hose	250	400	500
Price	\$35.00	\$45.00	\$55.00

WAREHOUSE, FACTORY AND MILL CARTS

Frame and reel are made of tubular steel. Wheels are wood. Have tool box in front and friction roller at rear. Neatly painted and striped.

Number of Carts	440	441	442	443
Height of wheels...in.	40	44	48	52
Extreme outer width, inches	38	42	48	54
Extreme length.....	5 ft. 6 in.	6 ft. 2 in.	6 ft. 6 in.	7 ft.
Weight complete...lbs	95	165	180	210
Shipping wgt., crated, lbs.	110	180	200	230
Capacity, 1½-inch cotton rubber lined mill hose.....feet	400	500	650	800
Capacity, 2-inch cotton rubber lined mill hose.....feet	250	350	500	600
Capacity, 2½-inch cotton rubber lined mill hose.....feet	200	250	400	500
Price	\$35.00	\$45.00	\$55.00	\$65.00

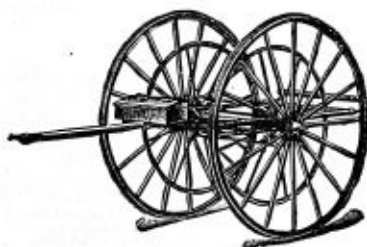


FIG. 1602

WROUGHT FRAME CARTS

A well made, low priced cart, with tool box, friction roller in rear, rope reel and rope; two cone pipe holders. Nicely painted and striped.

Without rope reel and rope deduct \$16.00 from list price.

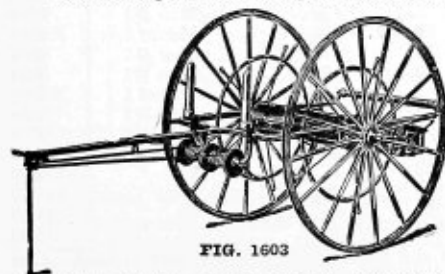


FIG. 1603

	55	56
Height of wheel...inches	52	60
Extreme width of cart,in.	50	60
Extreme length of cart,	8 ft. 4 in.	9 ft.
Weight complete in lbs.,	220	310
Shipping weight, crated, lbs.	300	400
Capacity of 2½-inch cotton rubber lined mill hose.....feet	500	800
Capacity of 2½-inch double jacket or rubber hose.....feet	300	500
List price.....	\$35.00	105.00

Carts can be equipped with automatic gongs at following prices: 8-inch, \$8.00; 10-inch, \$9.25; each net additional.



FIG. 1604

WIRT'S "ECLIPSE" SWINGING HOSE RACKS

No.	Capacity	Price
62	25 to 75 ft. of 1½ or 1¼ in. Unlined Linen Hose	\$5.00
63	25 to 75 ft. of 2 in. Unlined Linen Hose	5.00
64	25 to 75 ft. of 2½ in. Unlined Linen Hose	5.00
65	100 to 150 ft. of 1¼ or 1½ in. Unlined Linen Hose	6.00
66	100 to 150 ft. of 2 in. Unlined Linen Hose	6.00
67	100 to 150 ft. of 2½ in. Unlined Linen Hose	6.00



FIG. 1605

WIRT'S SINGLE "V" SWINGING WALL REEL

Made of Steel and Malleable Iron. This reel is strong, serviceable and ornamental; takes up less space, and presents less surface for the accumulation of dust than any other made. The reel will swing to any angle from the wall, and the hose will unwind without a knot or twist. A very important feature in its construction is that tension axles are used, so that the reel may be adjusted to run tight or loose as desired.

Can be furnished with wall brackets or pipe clamps as illustrated.



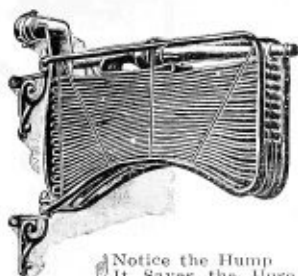
FIG. 1606

Style V Wall Reels are furnished in japanned red, unless otherwise specified; finished in gold or aluminum bronze, if desired, without extra charge. Any size (excepting Nos. 8 and 9) plated in nickel or copper, at an additional cost of \$2.00 each net; for No. 8, price \$3.00 net, and No. 9, price \$3.50 net; white enamel finish, 50 cents each net extra any size.

Number	Size of Hose	Capacity Unlined Linen	Cap. Cotton R. L. Mill Hose	DIMENSIONS		Price
				Width b't'n Spokes	Diameter	
0	1¼ or 1½ in.	50 feet	.....	3½ inches	15 inches	\$ 6.00
00	2 in.	50 "	.....	3¾ "	15 "	6.00
000	2½ in.	50 "	.....	4½ "	15 "	6.00
0½	1¼ or 1½ in.	75 "	.....	3½ "	17 "	6.00
00½	2 in.	75 "	.....	4¼ "	17 "	6.00
000½	2½ in.	75 "	.....	4¾ "	17 "	6.00
1	1¼ or 1½ in.	100 "	.....	3½ "	21 "	6.00
2½	2 in.	100 "	.....	4¼ "	21 "	6.00
3½	2½ in.	100 "	.....	4¾ "	21 "	6.00
2	1¼ or 1½ in.	150 "	50 feet	3½ "	26 "	6.00
3	2 in.	150 "	50 "	4¼ "	26 "	6.00
4	2½ in.	150 "	50 "	4¾ "	26 "	6.50
5½	1¼ or 1½ in.	200 "	.....	5½ "	21 "	7.00
6½	2 in.	200 "	.....	8 "	21 "	7.50
7½	2½ in.	200 "	.....	9 "	21 "	8.00
5	1¼ or 1½ in.	300 "	100 "	5½ "	26 "	7.50
6	2 in.	300 "	100 "	8 "	26 "	8.00
7	2½ in.	300 "	100 "	9 "	26 "	8.50
8	3½ in.	400 "	150 "	9 "	32 "	11.50
9	2½ in.	600 "	200 "	9 "	36 "	15.00

NOTE—Nos. 5, 5½, 6, 6½, 7, 7½, 8 and 9 are made for two tiers of hose. List prices include either wall brackets or pipe clamps, the latter not in excess of 4-inch; 5-inch clamps, 35c; 6-inch, 50c; 7-inch, 65c; and 8-inch, 75c per pair net extra. Approved by the Associated Factory Mutual Fire Insurance Companies.

WIRT'S HUMP HOSE RACK, STYLE T



Notice the Hump
It Saves the Hose

FIG. 1607

The length of service of hose may be materially increased by the construction of the fixture carrying it. There are 25 breaks or folds in a 50-ft. length of hose when placed upon a hose rack. On a straight flat bottom these breaks are sharp; on a bottom that is higher at the center than at the ends the weight is taken off the ends, and these breaks become easy folds; therefore the hose will not break at the folds when run off.

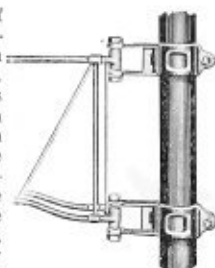


FIG. 1608

A very important feature of this rack is that the front end is partially enclosed. This basket formation holds the stack of hose in position when drawn off, preventing the stack from sliding out bodily and falling to the floor in a tangled mass, as is frequently the case with the old style open end rack.

The Hump Racks are attached to wall brackets or pipe clamps at the top and bottom, insuring great strength.

The Hump Rack is particularly recommended for either cotton rubber lined or unlined linen hose where a reel is not considered suitable or desired.

The Hump Racks are furnished in japanned red unless otherwise specified; furnished in gold or aluminum bronze if desired without extra charge; finished in nickel or copper plate at an additional cost of \$2.00 each net.

Number	Size of Hose	Capacity Unlined Linen	Capacity Cotton Mill Hose	Height	Length	Price
A0	1¼ or 1½ in.	50 feet	.....	11 inches	22 inches	\$5.00
A0X	2 inch	50 "	.....	11 "	22 "	5.00
A00	2½ inch	50 "	.....	11 "	22 "	5.00
A075	1¼ or 1½ in.	75 "	.....	14 "	22 "	5.50
A0X75	2 inch	75 "	.....	14 "	22 "	5.50
A0075	2½ inch	75 "	.....	14 "	22 "	5.50
A1	1¼ or 1½ in.	100 "	25 feet	16 "	24 "	6.00
A1X	2 inch	100 "	25 "	16 "	24 "	6.00
A2	2½ inch	100 "	25 "	16 "	24 "	6.00
A3	1¼ or 1½ in.	150 "	50 "	23 "	28 "	7.00
A3X	2 inch	150 "	50 "	23 "	28 "	7.00
A4	2½ inch	150 "	50 "	23 "	28 "	7.00
A5	1¼ or 1½ in.	200 "	100 "	34 "	34 "	7.50
A5X	2 inch	200 "	100 "	34 "	34 "	7.50
A6	2½ inch	200 "	100 "	34 "	34 "	8.00

For 1-inch hose, A0, A075, A1, A3 and A5 can be specially made without extra charge.

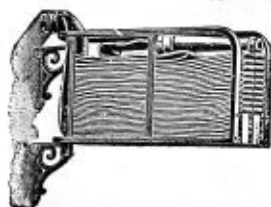
Furnished with wall brackets unless otherwise specified.

List prices include either wall brackets or pipe clamps, the latter not in excess of 4-inch, 5-inch, 35c; 6-inch, 50c; 7-inch, 65c, and 8-inch, 75c per pair net extra.

NOTICE.—To avoid mistakes, and to get the proper rack when you order, give size, kind and length of hose. When you order racks with pipe clamps, be sure to give size of pipe they are to fit. If not standard size pipe, you must give the outside diameter. Always use the letter "A" with number of rack.

Approved by the Associated Factory Mutual Fire Insurance Companies.

WIRT'S "ANGLE IRON" RACK STYLE V



Japanned red, unless otherwise specified; gold or aluminum finish if desired without extra charge; finished in nickel or copper plate at an additional cost of \$2.00 each net.

Showing Pipe Clamps

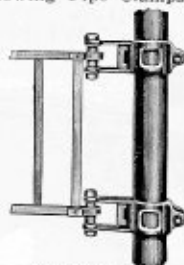


FIG. 1609

Fig. 1610

Number	Size of Hose	Capacity Unlined Linen	Capacity Cotton Mill Hose	Height	Length	Price
70	1¼ or 1½ in.	50 feet	.....	11 inches	22 inches	\$5.00
71	2 in.	50 "	.....	11 "	22 "	5.00
72	2½ in.	50 "	.....	11 "	22 "	5.00
70-75	1¼ or 1½ in.	75 "	.....	14 "	22 "	5.50
71-75	2 in.	75 "	.....	14 "	22 "	5.50
72-75	2½ in.	75 "	.....	14 "	22 "	5.50
73	1¼ or 1½ in.	100 "	25 feet	16 "	24 "	6.00
74	2 in.	100 "	25 "	16 "	24 "	6.00
75	2½ in.	100 "	25 "	16 "	24 "	6.00
76	1¼ or 1½ in.	150 "	50 "	23 "	28 "	7.00
77	2 in.	150 "	50 "	23 "	28 "	7.00
78	2½ in.	150 "	50 "	23 "	28 "	7.00
79	1¼ or 1½ in.	200 "	100 "	34 "	34 "	7.50
80	2 in.	200 "	100 "	34 "	34 "	7.50
81	2½ in.	200 "	100 "	34 "	34 "	8.00

For 1-inch hose, 70, 70-75, 73, 76 and 79 can be specially made without extra charge.

Furnished with wall brackets unless otherwise specified.

List prices include either wall brackets or pipe clamps, the latter not in excess of 4-inch, 5-inch, 35c; 6-inch, 50c; 7-inch, 65c, and 8-inch, 75c per pair net extra.

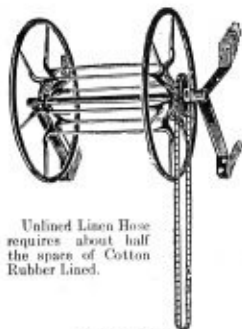
NOTICE.—To avoid mistakes, and to get the proper rack when you order, give size, kind and length of hose. When you order racks with pipe clamps, be sure to give size of pipe they are to fit. If not standard size pipe, you must give the outside diameter.

Approved by the Associated Factory Mutual Fire Insurance Companies.

WIRT'S BRACKET REEL, STYLE W

A very strong, substantial, stationary Wall Reel, supplied with or without sprocket and chain, especially adapted for carrying larger quantities of hose than would be practical on a swinging wall reel or rack, finished in red enamel.

Without Sprocket and Chain Deduct \$2 From List Price



Unlined Linen Hose requires about half the space of Cotton Rubber Lined.

FIG. 1611

Number of Reel.....	198	199	200	201	202
Diameter of Reel.....in.	21	26	30	30	30
Outside Length of Reel.in.	20	24	26	30	34
Capacity of 1½-in. Cotton					
Rubber Lined Hose.ft.	150	200	300	400	500
Capacity of 2-in. Cotton					
Rubber Lined Hose.ft.	100	150	200	300	400
Capacity of 2½-in. Cotton					
Rubber Lined Hose.ft.	50	100	150	250	350
Price, with sprocket and chain	\$14.00	16.00	18.00	20.00	22.00

HOSE HOUSE FIXTURES

No. 316—Underwriters
Playpipe holder, nozzle
not included.

LIST PRICES

Axe Blade Holders



No. 305



No. 306

Axe Blade Holders



No. 301



No. 302

Crowbar Holders



No. 303



No. 304

Crowbar Holders



No. 307



No. 308

Playpipe Holders



No. 309



No. 310

Fire Pole Holders



No. 311



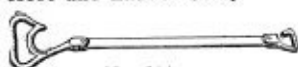
No. 312

Spanner Holders



No. 313

Hose and Ladder Strap



No. 314

Taber Spanner



No. 315

FIG. 1612

R-W FUSIBLE LINK FOR FIRE DOORS

EACH LINK STAMPED 160 DEGREES

Full Size Cut No. 96

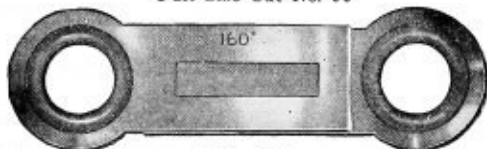


FIG. 1613

Full Size Cut No. 96½



FIG. 1614

These fusible links are used for fire door fixtures and are adapted for use on all doors and windows, which are constructed to close automatically by heat. These links melt at 160 degrees Fahrenheit.

No. 96 Fusible Link	each	\$0.30
No. 96½ Fusible Link	each	.20



FIG. 1615

"BESTOVALL" CHEMICAL FIRE EXTINGUISHER

LOOSE STOPPER

Completely and instantly quenches fire in gasoline, naphtha, tar, pitch and rubber cement and other inflammable substances water will not extinguish. Tested, approved and labeled by the Underwriters Laboratories.

A safe and reliable extinguisher. Each tested to 350 pounds to the square inch. Capacity, 2½ gallons net.

Priceeach \$15.00
Extra chargesper dozen 6.00

PYRENE FIRE EXTINGUISHERS



FIG. 1616

Kills fire from any cause—instantly. Can injure nothing. Will not freeze at 50 degrees below zero. Never deteriorates—no recharging. No upkeep cost—simple to operate.

Tested, approved and labeled by the Underwriters' Laboratories, Inc.

PYRENE FIRE EXTINGUISHERS are 100 per cent efficient on fires from any cause. It is the only type of extinguisher that will put out blazing gasoline, kerosene, benzine, acetylene gas, etc. Water makes such fires worse. It spreads the flames.

PRICE LIST

Brass Extinguisher, complete with black bracket.....\$10.00
Nickel Extinguisher, complete with black bracket..... 10.50

PYRENE LIQUID

Quart Caneach \$1.50
Gallon Caneach 6.00

JOHNS-MANVILLE FIRE EXTINGUISHER



FIG. 1617

The Johns-Manville Fire Extinguisher possesses every desirable feature of a one-quart type—plus an exclusive two-way method of operation. This method permits discharge either by pumping or by storing sufficient pressure with nozzle closed to discharge contents when nozzle is opened. With the latter method both hands are left free to aim, and operation in cramped quarters is greatly facilitated.

Instant and certain of action and efficient for all incipient fires, including oil, gasoline, kerosene or electric arc. Its use entitles car owners to 15 per cent reduction on auto fire insurance. Examined, approved and labeled by the Underwriters' Laboratories, Inc., under the direction of the National Board of Fire Underwriters.

Price, complete, nickel or brass finish, including black enameled bracket for wall, automobile or truck use.

Priceeach \$10.00

Packed in individual boxes. Shipping weight (approx.) 8 lbs.

Five to Standard Carton. Shipping weight (approx.) 42 lbs.

JOHNS-MANVILLE FIRE EXTINGUISHER FLUID

Johns-Manville Extinguishing Fluid for recharging is sold in sealed cans or drums. This fluid never deteriorates, is non-corrosive, a non-conductor, and the only fluid recommended for use in the Johns-Manville Extinguisher.

PRICES

One quart can, per quart. Shipping weight (approx.) $3\frac{1}{2}$ lbs.....each \$1.50
Six to Standard Carton. Shipping weight (approx.) 23 lbs.

One gallon can, per gallon. Shipping weight (approx.) 14 lbs.....each 5.75
Six to Standard Carton. Shipping weight (approx.) 95 lbs.

50 or 110 gallon drumsper gallon 5.50

WHITE RUBBER SHEET PACKING



FIG. 1618

Used on flanges, boiler heads, unions, etc.

Wire Insertion

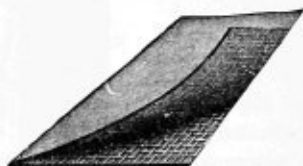


FIG. 1618

For steam, oil, water, gas and ammonia pressures up to 200 lbs.

"BESTOVALL"

"Bestovall" White Sheet Packing is the most durable, effective and economical flange joint packing made. It is a scientific and practical composition of the purest rubber and finest asbestos, and will resist extreme heat and pressure better and longer than any other packing in the world. It will not crawl, melt or blow out of the joints under highest pressure of superheated steam, and its exceptionally fine quality will not deteriorate with age.

Price Plainper lb., \$1.00; With Wire Insertion, per lb., \$1.50

"CENTURY" WHITE SHEET PACKING

A popular brand of high grade packing. Guaranteed by the manufacturers to give satisfactory service.

Price, Plainper lb., \$1.00; With Wire Insertion, per lb., \$1.50

Put up in rolls 36 inches wide, containing either 100 or 200 lbs. Any length cut to order.

RED RUBBER SHEET PACKING

For Steam, Oil, Water, Gas and Ammonia Pressures Up to 200 Lbs.

"FORT PITT"



FIG. 1619

This is our most popular brand of RED sheet and is unquestionably the best grade of red sheet packing produced. It will make a hot or cold joint equally well. It is not affected by heat; will not harden, crack or blow out, and is practically impervious to the action of oils, liquors, etc. This packing is elastic, though firm, and will easily conform to any unevenness of surface, making a perfect joint. It differs from most sheet packings, in that it will not cling to the flanges, and can be easily removed.

Price, Plain.....per lb., \$1.00

With Wire Insertion, per lb., 1.50

"RAINBOW" RED SHEET PACKING

A Packing too well known to waste words in describing its qualities.

Price, Plainper lb., \$1.00; With Wire Insertion, per lb., \$1.50

Put up in rolls 36 inches wide, containing either 100 or 200 lbs. Any length cut to order.

BLACK RUBBER SHEET PACKING

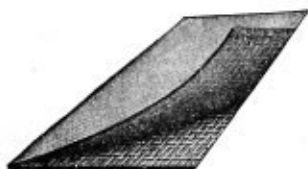


FIG. 1620

For Use on Flanges, Boiler Heads,
Unions, Etc.

For Steam, Oil, Gas, Ammonia, Etc.
Pressures Up to 200 Lbs.

Wire Insertion



"PARAMOUNT"

Paramount is an exceptionally satisfactory black sheet for high grade service. It is peculiarly adapted to use with high pressure and superheated steam, especially where oil is present. It is proof also against acids, brine, gas and ammonia, and will not blow out under high pressures if joints are properly made up. Being non-hardening, it retains its elasticity and allows repeated breaking of joints without destroying the gasket.

Price, Plain per lb., \$1.30; With Wire Insertion, per lb., \$1.75

Some other popular brands of Black Sheet Packing:

JENKINS' '96 Plain, per lb., \$1.00; With Wire Insertion, per lb., \$1.25

EBONITE Plain, per lb., 1.00; With Wire Insertion, per lb., 1.10

N. B. O. Plain, per lb., 1.00; With Wire Insertion, per lb., 1.10

Put up in rolls 36 inches wide, either 100 or 200 lbs. Any length.

PURE RUBBER SHEET PACKING



FIG. 1621

For Use Where a Special Flexible Gasket
Is Desired.

For Steam, Gas, Air, Oil and Ammonia.
Pressures Up to 200 Lbs.

"GAGE SPECIAL"

The demand for this style sheet is generally for the best quality, and we therefore recommend our "Gage Special" Pure Rubber Sheet Packing as a strictly high grade gum.

Price per lb. \$2.00

Put up in rolls 36 inches wide, either 100 or 200 lbs. Any length cut to order.

SUPERHEAT HIGH PRESSURE SHEET PACKING

For Use Where All Other Sheet Packings Have Failed

Used on Flanges, Unions, and Any and All Kinds of Superheat Work



FIG. 1622

"RODGERS"

This is the highest grade sheet packing in the world. It cannot burn, blow or squeeze out and it has a tensile strength of over 6,000 pounds per square inch. This material is not affected by any temperature up to 672 degrees F., and a joint of it can be opened up as often as is desired without in any way affecting the life of the packing.

It is equally adapted for use on water, steam, air, ammonia, oil, acid or any service upon which a sheet can be used. The great resisting qualities of this packing makes it particularly desirable for superheated steam.

For special high temperature, superheat steam, etc. All pressures.

Priceper lb., \$2.00

Other popular brands of Superheat Sheet Packing we supply are:

"VAPORITE"	per lb., \$2.00
"TAURIL"	per lb., 2.00
"GOODYEARITE"	per lb., 2.00
"DURABLE"	per lb., 2.00

Above furnished in sheets 48x48 inches.

ASBESTOS SHEET PACKING**BRASS WIRE INSERTION**

Used on Flanges, Unions, Boiler Heads, Etc.

"BESTOSKING"

This is our most popular brand of this style packing, as it is practically indestructible. It will not burn out under the most extreme temperature and is the ideal packing for superheated steam, gas or dry heat conditions. Made from long fibre Canadian asbestos, spun around fine brass wire into threads of great tensile strength, which is then woven into cloth. This cloth is vulcanized under great pressure. Unlike the ordinary asbestos packing, which is simply coated with a cement, this packing is absolutely unaffected by condensation or wet steam and does not disintegrate. Will not blow out under pressure.



FIG. 1623

For All Pressures and Superheat Steam..... Price per lb., \$1.50

Put up in rolls 36 in. wide, either 100 or 200 lbs. Any length. Cut to order.

"MOTORBESTOS" SHEET PACKING

Red and Black, With Brass Wire Insertion



FIG. 1624

This is a packing specially made for all Gas and Gasoline motors, used in Automobile, Marine and Stationary service.

It is red on one side and black on the other and specially treated for the particular requirements of this service.

Made in thicknesses $\frac{1}{2}$ in. and $\frac{3}{8}$ in. and 39 inches wide.

Priceper lb., \$1.50

CLOTH INSERTED RUBBER SHEET PACKING

Cloth on One Side or Cloth Both Sides

For Use on Flanges, Unions, Boiler Heads, Drums, Etc.

"DUQUESNE"

This is our most popular brand of Cloth Inserted Packing. The same high grade materials and workmanship are used in "Duquesne" Sheet Packing as in the plain rubber sheets. There is a growing demand for a better grade of this style packing, and the "Duquesne" is made to fill this requirement, although we carry cheaper grades.



FIG. 1625

"MONARCH"

This is a good commercial grade of Cloth Inserted Packing.

Brands	Cloth Inserted List, Lb.	Both Sides List, Lb.	Cloth 1 Side List, Lb.
"DUQUESNE"	\$0.50	\$0.50	\$0.50
"MONARCH"	.40	.40	.40

EXTRAS $\frac{1}{32}$ Cloth Inserted or one side, 4c lb. net advance. $\frac{1}{16}$ Cloth both sides, 8c lb. net advance. $\frac{1}{8}$ Cloth both sides, 3c lb. net advance.

Put up in rolls 36 inches wide, either 100 or 200 lbs. Any length.

"FORT PITT" DIAGONAL OR WEDGE PACKING**FIG. 1626**

For Steam Pressures Under 100 Lbs.
This packing is constructed of two diagonally cut wedges and an absorbent cushion. The wedges are made of the best material, and are guaranteed. The wedges are so constructed that they will slip on each other and so adapt themselves to any unevenness in a worn or scored rod. The cushion is a great absorber and is filled with lubricating oil and graphite, and will absorb and retain oil fed to a stuffing-box on the rod or in any other way. This packing should be used where the pressures does not exceed 100

pounds. Where the pressure is above that amount, use our Fort Pitt Special Diagonal. We carry this packing in stock in sizes of $\frac{1}{4}$ inch, increasing by sixteenths to 1 inch. Other sizes made on order.

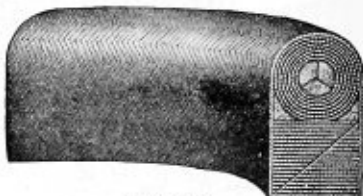
Price per lb., \$1.25

"FORT PITT" SPECIAL DIAGONAL PISTON PACKING

For high pressures, 100 to 200 pounds.
It is also excellent on high ammonia and for hydraulic pressures, hot water, valve stems, etc.

This packing is made with a split sliding wedge like the low-pressure, but instead of a soft cushion it contains round, highly elastic, hard-friction tucks. It is carried in stock in $\frac{1}{4}$ -inch size, increasing by sixteenths to 1 inch. Other sizes made to order.

Price per lb., \$1.50

**FIG. 1627****DANIELS P. P. P. ROD PACKING****FIG. 1628****FIG. 1629**

For all purposes, steam, ammonia, air, oil, etc. Made in all sizes from $\frac{1}{8}$ inch up.

Regular P. P. P. for steam pressures of 100 pounds and less; ordinary water pressure, warm or cold, valve stems, etc.

Price, Coil Form, Style No. 182..... per lb., \$1.25

Price, Spiral Form, Style No. 186..... per lb., 1.50

Price, Ring Form, Style No. 184..... per lb., 1.75

Special P. P. P. for steam pressures over 100 pounds when not superheated; ammonia, high hydraulics, air pumps, etc.

Price, Coil Form, Style No. 183..... per lb., \$1.50

Price, Spiral Form, Style No. 187..... per lb., 1.75

Price, Ring Form, Style No. 185..... per lb., 2.00

Low Pressure



FIG. 1630

High Pressure



FIG. 1631

"BLACK SQUADRON" VALVE AND ROD PACKING

Made in All Styles for All Purposes
Air, Steam, Ammonia or Water

The success of our packings is largely due to the careful study we have made of the conditions under which each class of packings is intended to work.

LOW PRESSURE: For pressures under 100 lbs.

Priceper lb., \$1.30

HIGH PRESSURE: For pressures over 100 lbs. and under 150 lbs.

Priceper lb., \$1.50

"SKOOKUM" UNIVERSAL DIAGONAL CROSS EXPANSION PACKING



FIG. 1632

Under easy pressure from the gland, "Skookum" will expand and fill every space, maintaining a smooth surface against the rod without heating it.

"Skookum" Expansion Packing is the only packing yet devised which is serviceable, and perfectly satisfactory, for use with steam up to 150 lbs. pressure, with hot or cold water, hot or cold air, and in ammonia pumps. When placed around bent or vibrating rods or in uneven stuffing boxes, it will hold where other packings fail to do the work.

Diameter	inches	$\frac{1}{8}$	$\frac{1}{4}$ and $\frac{3}{8}$	$\frac{1}{2}$ and larger
Price	per lb.	.....	.....	.....

SQUARE HYDRAULIC PACKING



FIG. 1633

Used on Steam Pumps, Elevators, Etc.

For Steam and Hydraulic Pressures 500 to 2,000 Lbs.

"BESTOVALL"

This brand is well known to users of Hydraulic Packing. It meets all requirements expected of a packing of this style.

Price, per lb.....\$1.00

Sizes	1/8	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2
Feet in box, about...	60	60	60	60	60	60	48	48	48	48	48	24	24	12	12

SQUARE HYDRAULIC RUBBER BACK PACKING

For Use on Elevators. Cannot Be Used with Hot Water or Steam

For Cold Water Pressures 500 to 2,000 Lbs.

"PARAMOUNT"

The use of this style of Packing should always be of the highest grade. "Paramount" meets every requirement.

Price per lb.....\$1.20



FIG. 1634

Sizes	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 3/4	2
Ft. in box, about	60	60	60	60	48	48	48	48	24	24	24	12	12	12	12

"FORT PITT" TUCK PACKING SQUARE AND ROUND

Square



FIG. 1635

For use on Cold Water Pumps and similar purposes.

Square, per lb.....\$0.75

Round, per lb..... 1.00

Round



FIG. 1636

Sizes	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 3/4	2
Feet in box, about...	60	60	60	60	48	48	48	48	24	24	24	12	12	12	12

SQUARE TUCK RUBBER BACK PACKING

For Use on Elevators, Pumps, Etc.

State Whether Wanted for Inside or Outside Packed Pumps.

For Pressures Up to 200 Lbs.

"BESTOVALL"

Made from specially treated duck with a rubber cushion, making a tight and frictionless packing. It wears slow and the cushion expands and takes up the slight wear, giving much longer service.

Price, per lb.....\$1.20

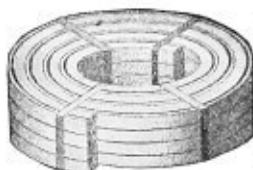


FIG. 1637

Sizes	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 3/4	2
Feet in box, about...	60	60	60	60	48	48	48	48	24	24	24	12	12	12	12

ROUND OR SQUARE PURE RUBBER PACKING

Used for Marine and Hydraulic Work. For Use on Steam Pumps, Elevators, Etc.

"PARAMOUNT"

Is strictly high grade stock, extremely light and very serviceable. While it is higher per pound, the cost to the user is less per lineal foot than lower grades which contain heavy compounds, adding to their weight.

Price per lb.....\$2.00



FIG. 1638

Sizes	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	2	3	4	6	8	10	12	14	16	18	20	24	30	36	48	60	72	84	96	108	120	144	168	192	216	240	264	288	312	336	360	384	408	432	456	480	504	528	552	576	600	624	648	672	696	720	744	768	792	816	840	864	888	912	936	960	984	1008	1032	1056	1080	1104	1128	1152	1176	1200	1224	1248	1272	1296	1320	1344	1368	1392	1416	1440	1464	1488	1512	1536	1560	1584	1608	1632	1656	1680	1704	1728	1752	1776	1800	1824	1848	1872	1896	1920	1944	1968	1992	2016	2040	2064	2088	2112	2136	2160	2184	2208	2232	2256	2280	2304	2328	2352	2376	2400	2424	2448	2472	2496	2520	2544	2568	2592	2616	2640	2664	2688	2712	2736	2760	2784	2808	2832	2856	2880	2904	2928	2952	2976	3000	3024	3048	3072	3096	3120	3144	3168	3192	3216	3240	3264	3288	3312	3336	3360	3384	3408	3432	3456	3480	3504	3528	3552	3576	3600	3624	3648	3672	3696	3720	3744	3768	3792	3816	3840	3864	3888	3912	3936	3960	3984	4008	4032	4056	4080	4104	4128	4152	4176	4200	4224	4248	4272	4296	4320	4344	4368	4392	4416	4440	4464	4488	4512	4536	4560	4584	4608	4632	4656	4680	4704	4728	4752	4776	4800	4824	4848	4872	4896	4920	4944	4968	4992	5016	5040	5064	5088	5112	5136	5160	5184	5208	5232	5256	5280	5304	5328	5352	5376	5400	5424	5448	5472	5496	5520	5544	5568	5592	5616	5640	5664	5688	5712	5736	5760	5784	5808	5832	5856	5880	5904	5928	5952	5976	6000	6024	6048	6072	6096	6120	6144	6168	6192	6216	6240	6264	6288	6312	6336	6360	6384	6408	6432	6456	6480	6504	6528	6552	6576	6600	6624	6648	6672	6696	6720	6744	6768	6792	6816	6840	6864	6888	6912	6936	6960	6984	7008	7032	7056	7080	7104	7128	7152	7176	7200	7224	7248	7272	7296	7320	7344	7368	7392	7416	7440	7464	7488	7512	7536	7560	7584	7608	7632	7656	7680	7704	7728	7752	7776	7800	7824	7848	7872	7896	7920	7944	7968	7992	8016	8040	8064	8088	8112	8136	8160	8184	8208	8232	8256	8280	8304	8328	8352	8376	8400	8424	8448	8472	8496	8520	8544	8568	8592	8616	8640	8664	8688	8712	8736	8760	8784	8808	8832	8856	8880	8904	8928	8952	8976	9000	9024	9048	9072	9096	9120	9144	9168	9192	9216	9240	9264	9288	9312	9336	9360	9384	9408	9432	9456	9480	9504	9528	9552	9576	9600	9624	9648	9672	9696	9720	9744	9768	9792	9816	9840	9864	9888	9912	9936	9960	9984	10000																																																																																																																																
Feet in box, about.....	60	60	60	48	48	48	36	36	36	36	24	24	12	12																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									</

Coils carried in stock, Spiral made to order only.

HIGH PRESSURES, ASBESTOS, RUBBER INSERTED BACK PACKING

Used on Piston Rods, Valve Stems, Marine and High Speed Engines
Spiral, Coil or Ring.

"BESTOVALL"

Made of the finest rubber and long fibre asbestos, molded under high pressure, to meet requirements of compound and triple expansion engines with high steam temperature and excessive piston speed. Toughest, most pliable and elastic packing on the market.

For Superheat Steam.
All Pressures Up to 600 Lbs.

Price, per lb....\$2.00

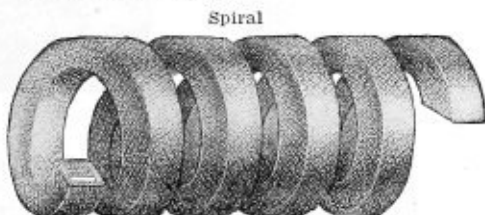


FIG. 1639

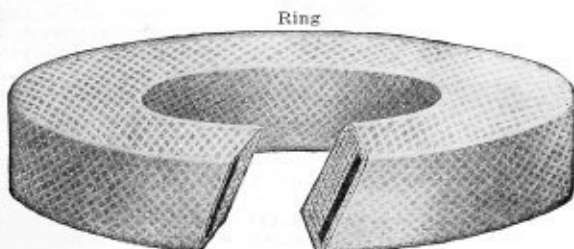


FIG. 1640

Sizes	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	2	3	4	6	8	10	12	14	16	18	20	24	30	36	48	60	72	84	96	108	120	144	168	192	216	240	264	288	312	336	360	384	408	432	456	480	504	528	552	576	600	624	648	672	696	720	744	768	792	816	840	864	888	912	936	960	984	1008	1032	1056	1080	1104	1128	1152	1176	1200	1224	1248	1272	1296	1320	1344	1368	1392	1416	1440	1464	1488	1512	1536	1560	1584	1608	1632	1656	1680	1704	1728	1752	1776	1800	1824	1848	1872	1896	1920	1944	1968	1992	2016	2040	2064	2088	2112	2136	2160	2184	2208	2232	2256	2280	2304	2328	2352	2376	2400	2424	2448	2472	2496	2520	2544	2568	2592	2616	2640	2664	2688	2712	2736	2760	2784	2808	2832	2856	2880	2904	2928	2952	2976	3000	3024	3048	3072	3096	3120	3144	3168	3192	3216	3240	3264	3288	3312	3336	3360	3384	3408	3432	3456	3480	3504	3528	3552	3576	3600	3624	3648	3672	3696	3720	3744	3768	3792	3816	3840	3864	3888	3912	3936	3960	3984	4008	4032	4056	4080	4104	4128	4152	4176	4200	4224	4248	4272	4296	4320	4344	4368	4392	4416	4440	4464	4488	4512	4536	4560	4584	4608	4632	4656	4680	4704	4728	4752	4776	4800	4824	4848	4872	4896	4920	4944	4968	4992	5016	5040	5064	5088	5112	5136	5160	5184	5208	5232	5256	5280	5304	5328	5352	5376	5400	5424	5448	5472	5496	5520	5544	5568	5592	5616	5640	5664	5688	5712	5736	5760	5784	5808	5832	5856	5880	5904	5928	5952	5976	6000	6024	6048	6072	6096	6120	6144	6168	6192	6216	6240	6264	6288	6312	6336	6360	6384	6408	6432	6456	6480	6504	6528	6552	6576	6600	6624	6648	6672	6696	6720	6744	6768	6792	6816	6840	6864	6888	6912	6936	6960	6984	7008	7032	7056	7080	7104	7128	7152	7176	7200	7224	7248	7272	7296	7320	7344	7368	7392	7416	7440	7464	7488	7512	7536	7560	7584	7608	7632	7656	7680	7704	7728	7752	7776	7800	7824	7848	7872	7896	7920	7944	7968	7992	8016	8040	8064	8088	8112	8136	8160	8184	8208	8232	8256	8280	8304	8328	8352	8376	8400	8424	8448	8472	8496	8520	8544	8568	8592	8616	8640	8664	8688	8712	8736	8760	8784	8808	8832	8856	8880	8904	8928	8952	8976	9000	9024	9048	9072	9096	9120	9144	9168	9192	9216	9240	9264	9288	9312	9336	9360	9384	9408	9432	9456	9480	9504	9528	9552	9576	9600	9624	9648	9672	9696	9720	9744	9768	9792	9816	9840	9864	9888	9912	9936	9960	9984	10
Feet Spiral in box..	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	$12\frac{1}{2}$	1																																																																																																																																																																																																																																																																																											



FIG. 1642

H.P. ASBESTOS, RUBBER CORE PACKING

Used on Piston Rods, Valve Stems,
Marine and High Speed
Engines
Spiral, Coil or Ring

"BESTOVALL"

For Superheat Steam, All Pressures Up to 600 Lbs.

Price, per lb. \$2.00

We ship spiral unless otherwise specified. If rings ordered, give size of rod and stuffing-box. Rings cannot be shipped promptly.

SPIRAL, PLAIN RING OR SECTIONAL RING GRAPHITED-STITCHED PACKING

Used on Piston Rods, Valve Stems, Etc.

For Steam, Air, Ammonia and Water
Pressures Up to 115 Lbs.

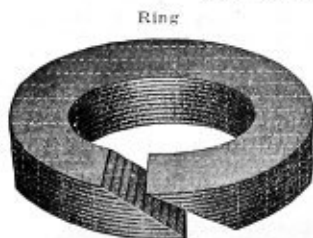


FIG. 1643



FIG. 1644

"BESTOVALL"

This special high grade packing is made to meet the growing demand for a better grade than is generally furnished. For all purposes outside of high pressure steam. Made of special grade rubber and duck lubricated with compound, and is the height of perfection of years of experience in fibrous packings. It embodies all improvements.

Price, per lb. \$1.60

"FORT PITT"

This brand enjoys a larger sale than any other similar packing. Been sold for years to largest users in America. Engineers in all

sections are thoroughly familiar with its merits.

Price, per lb. \$1.20

GARLOCK LOW PRESSURE

A Well-Known and Popular Grade of Packing

GARLOCK, No. 5. Ring. Price, per lb. \$1.20

GARLOCK, No. 15. Spiral. Price, per lb. 1.20

GARLOCK, No. 10. Sectional. Price, per lb. 1.20

Sizes	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 3/4	2
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Feet Spiral in box	12	12	12	12	12	12	12	12	12	12	12	12	12	12
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Sizes	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 3/4	2
-------	-----	------	-----	------	-----	-----	-----	-----	---	-------	-------	-------	-------	---

Feet Spiral in box	12	12	12	12	12	12	12	12	12	12	12	12	12	12
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We ship spiral unless otherwise specified. If rings or sectional ordered, give exact diameter of rod and stuffing-box. Rings cannot be shipped promptly.

SQUARE FLAX LUBRICATED PACKING

Used on Piston Rods, Plungers of Pumps, Elevators, Etc.

"BESTOVALL"

This is our most popular brand of Flax Packing. It is prepared expressly to meet the requirements of mills, furnaces, paper mills, etc.

"BESTOVALL" Square Flax Packing is made of selected long fibre flax only. No jute or hemp. The raw material is thoroughly cleaned to prevent any foreign matter clinging to the surface that might injure the rods. It is braided exactly square of a uniform size and lubricated with the best grade of lubricants.

Price, per lb.....\$0.90



FIG. 1646

"FORT PITT"

This is a good commercial grade of flax packing. The corners are made of long fibre flax, while a shorter grade is used as a filler. Will give excellent service.

Price, per lb.....\$0.60

Sizes	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$
Feet in box, about.....	120	120	88	84	57	48	26	24	24	24
Sizes	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	$1\frac{7}{8}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3
Feet in box, about.....	18	21	12	12	12	12	12	12	12	12



FIG. 1647

**SQUARE FLAX
GRAPHITED PACKING**

Used on Piston Rods, Plungers,
Accumulators, Elevators

For All Cold Water and Hydraulic
Working Pressures

"PARAMOUNT"

It is especially prepared from long fibre flax, thoroughly treated with special water-proof compound and best quality graphite.

Price, per lb.....\$1.50

Sizes	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$
Feet in Box, about.....	120	120	84	57	48	26	24	24	24	18	21

Any larger sizes furnished promptly.

WATERPROOF BRAIDED HYDRAULIC FLAX PACKING

Used on Cold Water Pumps, Plungers, Piston Rods, Valves, Etc.

SPIRAL, RING OR COIL

For Cold Water, Oil and Air Pressures Up to 1,000 Lbs.

Spiral

**FIG. 1648**

Ring

**FIG. 1649****"BESTOVALL"**

Made of the very highest grade long fibre Russian flax. It is especially prepared for hydraulic service. Thoroughly lubricated in our special waterproof compound.

Price per lb. \$1.25

GARLOCK WATERPROOF HYDRAULIC PACKING

Style No. 90, Coil price per lb. \$1.25
 Style No. 92, Spiral price per lb. 1.25
 Style No. 99, Ring price per lb. 1.25

Sizes	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3
Ft. Flat Coil in box, about..	48	48	48	48	48	36	36	36
Sizes	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{4}$	2 $\frac{1}{2}$	3
Ft. Flat Coil in box, about..	24	24	24	24	24	24	24	24

We ship spiral unless otherwise specified. If rings ordered, give exact diameter of rod and stuffing-box. Rings cannot be shipped promptly.

PEERLESS SPIRAL PACKING

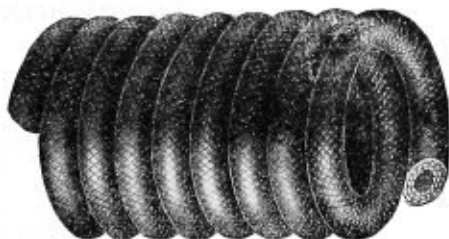


FIG. 1650

Made with round, red rubber core, surrounded by layers of loosely-woven duck. Absolutely free from grit or acid. Will hold 400 pounds steam.

In coil, spiral or ring form. All sizes.

When ordering rings, state diameter rod, O. S. diameter gland, depths of stuffing box or number of rings desired.

Price per lb. \$1.00

COBB'S HIGH PRESSURE PACKING



FIG. 1651

Cobb's High Pressure Packing is made with a rubber core of an oil and heat-resisting compound which is covered with a well frictioned duck and an outer covering of fine asbestos. It is guaranteed not to become hard or score the rods, but to remain elastic under all conditions. Cobb's packing is suitable for stationary and marine engines, corliss valves, air pumps, air compressors, steam feeds in saw mills, etc. Under all conditions where the pressure does not exceed 150 lbs. and the speed is moderate, Cobb's Packing will be found to render most satisfactory results.

Price per lb., \$1.00



FIG. 1652

GENUINE
EUREKA OVAL GUM CORE
PACKING

For all purposes and where rods are worn or out of line, no packing will give such satisfactory results as Genuine Eureka. It has that "give and take" feature, so necessary where bad rod conditions prevail.

Price per lb., \$.....

RAWHIDE HYDRAULIC PACKING

FOR COLD WATER



FIG. 1653

Specially adapted for water works, deep mine pumps, cold storage plants, hydraulic pumps in cotton gins and oil mills.

When you pack a pump with Rawhide Hydraulic Packing, the base of which is hide fiber (a natural lubricant) you furnish lubrication to the rods just so long as there is packing in the stuffing box, it being all a lubricant down to the last fiber. No digging out and throwing away. Once packed, simply add a new ring as required without disturbing the old. Rod cutting impossible.

Price, round or square.....per lb., \$2.00

"METAL BESTOS" HIGH PRESSURE PACKING



FIG. 1654

Designed for marine and power station use or on any engine using high pressure.

It is made with a core of the celebrated rubber-bestos compound, covered with a series of braids of finely spun asbestos thoroughly lubricated, outside of which is a covering of soft metallic wire. It cannot burn, char or blow out as the outside covering of soft wire will protect it against any steam pressure, and it also causes less friction than most textile packings.

Sizes from $\frac{1}{4}$ to $2\frac{1}{4}$ inches.

In boxes or coils.....per lb., \$1.20

"SEMIBRONZE" HIGH PRESSURE PACKING

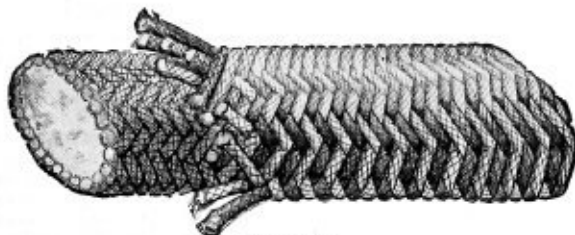


FIG. 1655

"Semibronze" High Pressure Packing is manufactured under a patented process and only the best grade of long fibre asbestos is used. The core is composed of spun asbestos and acts as a reservoir for our special Garco self-lubricating compound. The covering or jacket is made of strands of asbestos, each strand being braided over with a fine bronze wire, after which they are braided around the core of the packing, forming the jacket.

By this method of manufacturing the fibre or body of the packing is entirely encased in a network of wire which adds to the life of the packing by its resistance to wear and its protection to the fibre against being blown out of the stuffing box.

The fine bronze wire being a network allows the lubricant to pass readily to the piston rod and also allows the core to absorb and hold oil.

A MOST DEPENDABLE PACKING FOR ALL HIGH PRESSURE AND SUPERHEAT STEAM SERVICE. FULLY GUARANTEED.

Made in all sizes from $\frac{1}{4}$ inch to 2 inch by $\frac{1}{16}$ inch—in 12 foot lengths. Coil form, Style 405; ring form, Style 105.

The following table gives the approximate weight of each box:

Size	Weight Lbs. Oz.	Size	Weight Lbs. Oz.
$\frac{1}{4}$	6	$\frac{5}{8}$	8
$\frac{3}{16}$	6 8	$\frac{11}{16}$	8 8
$\frac{1}{2}$	6 12	$\frac{3}{4}$	9
$\frac{5}{8}$	7	$\frac{7}{8}$	10
$\frac{1}{2}$	7 8	$\frac{15}{16}$	11
$\frac{3}{4}$	8	1	12

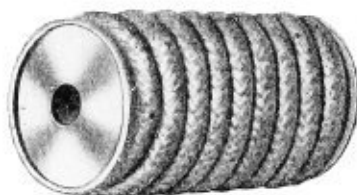
Prices quoted on request.

ASBESTOS VALVE STEM LUBRICATED PACKING

Used on Globe and Angle Valves and Expansion Joints for Superheated Steam,
All Pressures

"PARAMOUNT"

Twisted Round, Braided Round or Braided Square

**FIG. 1656**

This material is made from specially treated asbestos. Every fibre is saturated with our special lubricating compound. Furnished either twisted or braided. Used principally for packing angle and globe valves, and small stuffing-boxes which are usually so difficult to keep steam and water tight. It will stand any heat or pressure. We do not charge extra for the "Braided," and for this reason our sales are very large on this style. We carry the twisted but sell very little of it.

Twisted or Braided..... Price per lb. \$1.50

Twisted, Round Only

Sizes	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$
Number feet in lb., about.....	300	125	75	50

Braided Only, Round or Square

Sizes	$\frac{1}{16}$	$\frac{3}{16}$	$\frac{1}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
Number feet in lb., about.....	30	20	12	9	6½	5½	4	3

Unless otherwise specified, we ship round, but square can be furnished at same price.

"PALMETTO" SELF-LUBRICATING PACKING

Twist, on 1-pound Spools

**FIG. 1657**

Braided, Round and Square

**FIG. 1658**

For all steam and air pressures. Especially adapted to high pressures. Made of a material that heat cannot affect. Has high tensile strength, and each strand is so thoroughly saturated with graphite grease lubricant that it does not harden in service.

Size	inches	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{8}$	$\frac{1}{2}$
No. feet to 1 lb. spool.....		120	75	50	23	14	10	8
Price	per lb.	\$2.00	2.00	2.00	2.00	2.00	2.00	2.00

BRAIDED, ROUND AND SQUARE

Style	Size, Inches	Size box, lbs.	Price, per lb.
Braided	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, 1 , $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$, 2	5	\$2.00
Round and Square	$1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{8}$, $1\frac{1}{2}$, $1\frac{5}{8}$, $1\frac{3}{4}$, $1\frac{7}{8}$ and 2		

ASBESTOS WICK PACKING

Used on Stems of Globe and Angle Valves

For Steam Only, Pressures Up to 150 Lbs.

Asbestos Wick Packing is made of pure, long fibre asbestos twisted into strands similar to lamp wick. It can be used to pack all kinds of small valves and is a very necessary article around an engine room. It is heat proof, damp proof and acid proof. Dip it into some graphite mixed with oil before using.

Put up in $\frac{1}{2}$ and 1 lb. balls.

Packed in 5 and 10 lb. bags.

Price per lb. \$1.00



FIG. 1659

ASBESTOS ROPE PACKING

Used on Piston Rods and Valve Stems

For Steam Only, Pressures Up to 150 Lbs.

Sizes $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, 1 $\frac{1}{4}$, 1 $\frac{3}{8}$, 1 $\frac{3}{4}$, 2

Price per lb. \$0.80



FIG. 1660

HEMP PACKING

Italian A	per lb.	\$0.50
Italian B	per lb.	.40
American A	per lb.	.40
American B	per lb.	.30
Tallowed Hemp	per lb.	.20



FIG. 1661

RUBBER TUBULAR GASKETS

Used on Manheads, Handholes, Flanges, Etc.

For Steam, Air, Water, Etc. All Working Pressures

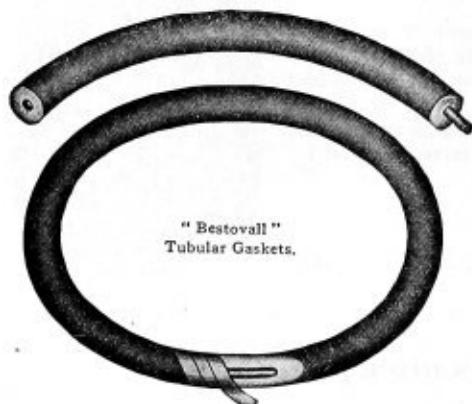


FIG. 1662

"BESTOVALL"

Will not harden or blow out, and can be repeatedly replaced. Joints can be made in from three to five minutes. It is put up in strong boxes with the trade-mark in red on the top of every box. Explicit directions, metal tubes and a roll of gummed tape, for wrapping seam spirally, accompany each box.

With one box of each size "BESTOVALL" Tubular Gasket Packing you can make any and all sizes of gaskets without waste. Can be fitted to any size man or hand-hole.

Price per lb., Black.....\$1.20

Sizes	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{2}$
Feet in Box, about.....	48	48	36	36	24	24	12	12	12



FIG. 1663

THE ECLIPSE
SECTIONAL
RAINBOW GASKET

Diameter	inch	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
Length	feet	48	36	36	24	18	12	12
Weight	lbs.	$1\frac{1}{2}$	$2\frac{3}{4}$	5	$5\frac{3}{4}$	6	$6\frac{1}{4}$	7

 $\frac{1}{4}$ to $\frac{3}{8}$ inch for Pipe Unions. $\frac{1}{2}$ inch for Hand Hole Plates. $\frac{5}{8}$ and $\frac{3}{4}$ inch for Man Hole Plates. $\frac{7}{8}$ and 1 inch for extra large Man Hole Plates.

Price per pound \$....

RUBBER TUBULAR GASKETS, WITH LEAD CORE

Used on Manheads, Handholes, Flanges, Etc.

For Steam, Air, Water, Etc. All Working Pressures

Brown's Lead Core

"BROWN'S SPECIAL"

This Tubular Packing is strictly high grade. It has few equals and no superiors. The lead center makes it very pliable and will hold its shape after being formed around head. It is put up in black box with trade-mark in red on every box. Explicit directions, extra metal tubes and a roll of gummed tape accompany each box.

Priceper lb. \$1.00



FIG. 1664

Sizes	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$
Feet in Box, about.....	48	48	36	36	24	24	12	12	12

ASBESTOS TUBULAR GASKET, LEAD CORE

For All Pressures Up to 2,000 Lbs.

"BESTOS METALLIC"

This is our most popular brand of Asbestos Lead Core Gaskets, composed of asbestos and copper wire interwoven with lead tube center to withstand increased high pressure and superheated steam, for which the ordinary rubber gasket does not prove satisfactory. Can be used on all sizes of manhole and handhole plates. Will not burn or blow out.

Priceper lb. \$1.50

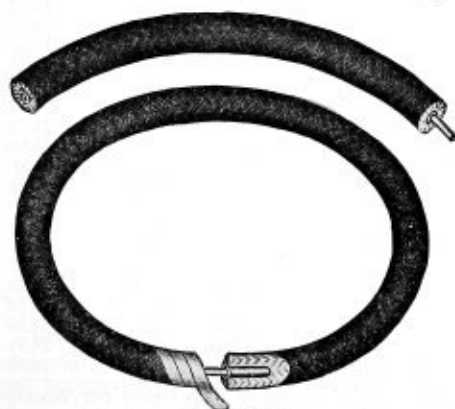


FIG. 1665

Sizes	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$
Feet in Box, about....	60	48	48	36	24	24	12	12	12	12

CORRUGATED COPPER GASKETS

For All Kinds of Flanged Joints, Cylinder Heads, Unions, Etc.



FIG. 1666

Soft (annealed) Copper will be sent unless otherwise ordered. Hard or cold rolled for extreme high pressure work, can also be furnished. We can furnish Corrugated Gaskets up to 60 inches in diameter.

DIAM.	PRICE	DIAM.	PRICE	DIAM.	PRICE	DIAM.	PRICE
1 in.	\$0.016	7 in.	\$0.77	18 in.	\$ 5.09	29 in.	\$13.21
1 1/4 "	.02	7 1/4 "	.83	18 1/4 "	5.23	29 1/4 "	13.44
1 1/2 "	.025	7 1/2 "	.88	18 1/2 "	5.38	29 1/2 "	13.67
1 3/4 "	.03	7 3/4 "	.94	18 3/4 "	5.52	29 3/4 "	13.90
1 1/2 "	.035	8 "	1.01	19 "	5.67	30 "	14.14
1 5/8 "	.04	8 1/4 "	1.07	19 1/4 "	5.82	30 1/4 "	14.37
1 3/4 "	.05	8 1/2 "	1.13	19 1/2 "	5.97	30 1/2 "	14.61
1 7/8 "	.055	8 3/4 "	1.20	19 3/4 "	6.13	30 3/4 "	14.85
2 "	.06	9 "	1.27	20 "	6.28	31 "	15.10
2 1/8 "	.07	9 1/4 "	1.34	20 1/4 "	6.44	31 1/4 "	15.34
2 1/4 "	.08	9 1/2 "	1.42	20 1/2 "	6.60	31 1/2 "	15.59
2 3/8 "	.09	9 3/4 "	1.49	20 3/4 "	6.76	31 3/4 "	15.83
2 1/2 "	.10	10 "	1.57	21 "	6.93	32 "	16.08
2 5/8 "	.11	10 1/4 "	1.65	21 1/4 "	7.09	32 1/4 "	16.34
2 3/4 "	.12	10 1/2 "	1.73	21 1/2 "	7.26	32 1/2 "	16.59
2 7/8 "	.13	10 3/4 "	1.82	21 3/4 "	7.43	32 3/4 "	16.85
3 "	.14	11 "	1.90	22 "	7.60	33 "	17.11
3 1/8 "	.15	11 1/4 "	1.99	22 1/4 "	7.78	33 1/4 "	17.37
3 1/4 "	.17	11 1/2 "	2.08	22 1/2 "	7.95	33 1/2 "	17.63
3 3/8 "	.18	11 3/4 "	2.17	22 3/4 "	8.13	33 3/4 "	17.89
3 1/2 "	.19	12 "	2.26	23 "	8.31	34 "	18.16
3 5/8 "	.21	12 1/4 "	2.36	23 1/4 "	8.49	34 1/4 "	18.43
3 3/4 "	.22	12 1/2 "	2.45	23 1/2 "	8.67	34 1/2 "	18.70
3 7/8 "	.24	12 3/4 "	2.55	23 3/4 "	8.86	34 3/4 "	18.97
4 "	.25	13 "	2.65	24 "	9.05	35 "	19.24
4 1/8 "	.27	13 1/4 "	2.76	24 1/4 "	9.24	35 1/4 "	19.52
4 1/4 "	.28	13 1/2 "	2.86	24 1/2 "	9.43	35 1/2 "	19.80
4 3/8 "	.30	13 3/4 "	2.97	24 3/4 "	9.62	35 3/4 "	20.08
4 1/2 "	.32	14 "	3.08	25 "	9.82	36 "	20.36
4 5/8 "	.34	14 1/4 "	3.19	25 1/4 "	10.01	36 1/4 "	20.64
4 3/4 "	.35	14 1/2 "	3.30	25 1/2 "	10.21	36 1/2 "	20.93
4 7/8 "	.37	14 3/4 "	3.42	25 3/4 "	10.42	36 3/4 "	21.21
5 "	.39	15 "	3.53	26 "	10.62	37 "	21.50
5 1/8 "	.41	15 1/4 "	3.65	26 1/4 "	10.82	37 1/4 "	21.80
5 1/4 "	.43	15 1/2 "	3.77	26 1/2 "	11.03	37 1/2 "	22.09
5 3/8 "	.45	15 3/4 "	3.90	26 3/4 "	11.24	37 3/4 "	22.38
5 1/2 "	.48	16 "	4.02	27 "	11.45	38 "	22.68
5 5/8 "	.50	16 1/4 "	4.15	27 1/4 "	11.66	38 1/4 "	22.98
5 3/4 "	.52	16 1/2 "	4.28	27 1/2 "	11.88	38 1/2 "	23.28
5 7/8 "	.54	16 3/4 "	4.41	27 3/4 "	12.10	38 3/4 "	23.59
6 "	.57	17 "	4.54	28 "	12.32	39 "	23.89
6 1/4 "	.61	17 1/4 "	4.67	28 1/4 "	12.54	39 1/4 "	24.20
6 1/2 "	.66	17 1/2 "	4.81	28 1/2 "	12.76	39 1/2 "	24.51
6 3/4 "	.72	17 3/4 "	4.95	28 3/4 "	12.98	39 3/4 "	24.82

LIST PRICES ARE FOR SOLID GASKETS on Basis Two Cents per Square Inch Surface. The DIFFERENCE between price of outside and inside Diameters will be the price of required Gaskets. Example for Gasket 6x8 inch, i. e.: 6-inch solid Gasket cost \$0.57; 8-inch solid Gasket cost \$1.01—difference, 44 cents for one 6x8-inch Gasket. Spacing and cutting bolt holes 2c each net extras.

"McKIM" COPPER-ASBESTOS GASKETS



FIG. 1667

For steam, air, gas or water pipe connections. For unions, flange unions, and plain flange joints.

FOR STANDARD FLANGE UNIONS				FOR EXTRA HEAVY FLANGE UNIONS			
Size of Pipe Inches	Inside Diam. Inches	Outside Diam. Inches	Price Each	Size of Pipe Inches	Inside Diam. Inches	Outside Diam. Inches	Price Each
$\frac{1}{2}$	$\frac{7}{8}$	$1\frac{3}{8}$	\$0.04	$\frac{1}{2}$	$1\frac{1}{8}$	$1\frac{3}{4}$	\$0.05
$\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{3}{8}$	.05	$\frac{3}{4}$	$1\frac{1}{8}$	$1\frac{3}{4}$	.05
1	$1\frac{5}{8}$	$1\frac{7}{8}$	.06	1	$1\frac{1}{4}$	2	.06
$1\frac{1}{4}$	$1\frac{1}{2}$	$2\frac{1}{8}$	.07	$1\frac{1}{4}$	$1\frac{5}{8}$	$2\frac{1}{4}$	.07
$1\frac{1}{2}$	2	$2\frac{1}{8}$	.08	$1\frac{1}{2}$	2	$2\frac{1}{8}$	.08
2	$2\frac{1}{2}$	$3\frac{1}{4}$	.10	2	$2\frac{3}{4}$	$3\frac{1}{2}$	.12
$2\frac{1}{2}$	$2\frac{1}{8}$	$3\frac{1}{8}$	.14	$2\frac{1}{2}$	$2\frac{1}{8}$	$3\frac{1}{8}$	.14
3	$3\frac{5}{8}$	$4\frac{1}{2}$	.16	3	$3\frac{5}{8}$	$4\frac{1}{2}$	.16
$3\frac{1}{2}$	$4\frac{1}{8}$	5	.20	$3\frac{1}{2}$	$4\frac{1}{8}$	5	.20
4	$4\frac{1}{8}$	$5\frac{3}{4}$	.25	4	$4\frac{1}{8}$	$5\frac{3}{4}$	.25
$4\frac{1}{2}$	$5\frac{1}{4}$	$6\frac{3}{8}$	.30	$4\frac{1}{2}$	$5\frac{1}{8}$	$6\frac{1}{4}$	.30
5	$5\frac{1}{8}$	$6\frac{3}{4}$	.38	5	$5\frac{1}{8}$	$6\frac{3}{4}$	.40
6	$6\frac{3}{4}$	8	.50	6	$6\frac{3}{4}$	8	.50
7	$7\frac{3}{4}$	$9\frac{3}{8}$	.60	7	$7\frac{3}{4}$	$9\frac{3}{8}$	.60
8	9	$10\frac{3}{8}$	.72	8	9	$10\frac{3}{8}$	.70
9	$9\frac{3}{4}$	$11\frac{1}{2}$	.80	9	...	...	...
10	$10\frac{3}{4}$	$12\frac{3}{4}$	.90	10	$10\frac{3}{4}$	$12\frac{3}{4}$	.90
12	$13\frac{3}{8}$	$15\frac{1}{8}$	1.15	12	...	...	...
14	$15\frac{1}{4}$	$17\frac{3}{8}$	1.55	14	...	...	...
16	$17\frac{1}{2}$	$19\frac{3}{4}$	2.00	16	...	...	...

NOTE—No sizes listed for 9-inch, 12-inch, 14-inch and 16-inch, the reason being that unions in these sizes are not manufactured in the Extra Heavy Style. (See Standard.)

Special Gaskets, not included in the foregoing schedules, made to order on short notice at proportionate prices.

"MCKIM" COPPER-ASBESTOS GASKETS

FOR STANDARD FLANGE
FITTINGSFOR EXTRA HEAVY FLANGE
FITTINGS

Size of Pipe Inches	Inside Diam. Inches	Outside Diam. Inches	Single Jacket Price Each	Double Jacket Price Each	Size of Pipe Inches	Inside Diam. Inches	Outside Diam. Inches	Single Jacket Price Each	Double Jacket Price Each
1	1 $\frac{1}{16}$	2 $\frac{1}{16}$	\$0.07	\$0.11	1	1 $\frac{1}{4}$	2 $\frac{1}{2}$	\$0.07	\$0.11
1 $\frac{1}{4}$	2	2 $\frac{1}{4}$	.08	.12	1 $\frac{1}{4}$	2 $\frac{1}{4}$	3 $\frac{1}{4}$	.10	.15
1 $\frac{1}{2}$	2 $\frac{1}{4}$	3 $\frac{1}{4}$	.10	.15	1 $\frac{1}{2}$	2 $\frac{3}{4}$	3 $\frac{3}{4}$	.14	.21
2	3	4	.14	.21	2	3 $\frac{1}{4}$	4 $\frac{1}{4}$	.17	.25
2 $\frac{1}{2}$	3 $\frac{3}{4}$	4 $\frac{3}{4}$	.16	.24	2 $\frac{1}{2}$	3 $\frac{3}{4}$	5	.20	.30
3	4 $\frac{1}{4}$	5 $\frac{1}{4}$	.20	.30	3	4 $\frac{1}{4}$	5 $\frac{3}{4}$	.25	.38
3 $\frac{1}{2}$	5 $\frac{1}{4}$	6 $\frac{1}{4}$	.30	.45	3 $\frac{1}{2}$	5 $\frac{1}{4}$	6 $\frac{1}{2}$	.30	.45
4	5 $\frac{3}{4}$	6 $\frac{3}{4}$	.34	.51	4	5 $\frac{3}{4}$	7	.38	.57
4 $\frac{1}{2}$	5 $\frac{7}{8}$	6 $\frac{7}{8}$	.38	.57	4 $\frac{1}{2}$	6 $\frac{1}{8}$	7 $\frac{5}{8}$	.47	.71
5	6 $\frac{1}{8}$	7 $\frac{1}{8}$	.47	.71	5	6 $\frac{3}{8}$	8 $\frac{3}{8}$	.53	.80
6	7	8 $\frac{1}{8}$	.55	.83	6	8 $\frac{1}{8}$	9 $\frac{3}{8}$	.65	.98
7	8 $\frac{1}{4}$	9 $\frac{1}{4}$	.68	1.02	7	9 $\frac{1}{4}$	10 $\frac{3}{4}$	.75	1.13
8	9 $\frac{1}{8}$	10 $\frac{1}{8}$	.75	1.13	8	10	12	.83	1.25
9	10 $\frac{3}{8}$	12 $\frac{3}{8}$	.90	1.35	9	11	13	.90	1.35
10	11	13 $\frac{1}{4}$	1.00	1.50	10	11 $\frac{1}{4}$	14 $\frac{1}{4}$	1.10	1.65
12	13 $\frac{3}{8}$	16	1.25	1.88	12	14	16 $\frac{3}{4}$	1.35	2.03
14	15 $\frac{3}{8}$	17 $\frac{3}{8}$	1.60	2.40	14	16 $\frac{1}{4}$	19	1.90	2.85
15	16 $\frac{1}{2}$	18 $\frac{1}{2}$	1.90	2.85	15	17 $\frac{1}{8}$	19 $\frac{1}{2}$	2.10	3.15
16	17 $\frac{1}{8}$	20 $\frac{1}{8}$	2.15	3.23	16	18 $\frac{1}{2}$	21 $\frac{1}{2}$	2.50	3.75
18	18 $\frac{3}{4}$	21 $\frac{3}{4}$	2.50	3.75	18	20 $\frac{1}{4}$	23 $\frac{3}{4}$	2.90	4.35
20	20 $\frac{3}{4}$	23 $\frac{3}{4}$	3.00	4.50	20	22 $\frac{1}{2}$	25 $\frac{1}{2}$	3.20	4.80
22	22 $\frac{3}{4}$	25 $\frac{3}{4}$	3.30	4.95	22	24 $\frac{1}{2}$	27 $\frac{1}{2}$	3.50	5.25
24	25 $\frac{3}{4}$	28 $\frac{3}{4}$	3.80	5.70	24	27	30	4.10	6.15

"MCKIM" COPPER-ASBESTOS OVAL GASKETS

FOR HAND HOLE, MAN HOLE AND TANK PLATES

HAND HOLE GASKETS		MAN HOLE GASKETS		TANK GASKETS	
Size in Inches	Price Each	Size in Inches	Price Each	Size in Inches	Price, Each
3 x 4	\$0.25	9 x 11	\$0.95	16 x 18	\$2.00
3 $\frac{1}{2}$ x 4 $\frac{1}{2}$	.30	9 x 13	1.10	17 x 19	2.25
3 x 5	.35	10 x 14	1.15	17 x 20	2.35
4 x 6	.45	10 x 15	1.20	18 x 20	2.50
5 x 7	.50	11 x 15	1.25	18 x 22	2.75
6 x 8	.60	12 x 16	1.35	18 x 24	2.90
7 x 9	.75	13 x 17	1.55	20 x 26	3.25
8 x 10	.85	16 x 18	1.75	24 x 20	3.75

NOTE—Intermediate and fractional sizes at same price as next larger size.

"GOETZE'S" ELASTIC CORRUGATED COPPER GASKETS

WITH ASBESTOS LINING No. 2



FIG. 1668

This gasket makes a joint practically as leak-proof as the pipe itself, even with the roughest, most uneven surfaces.

It not only makes a tight joint, but a permanently tight joint under any pressure or temperature.

Numerous exacting tests, as well as severe trials in actual service, have shown that it is not affected by sudden and radical changes of temperature (from extremes of cold and vice versa).

Furthermore, instead of requiring frequent renewal, often involving great labor cost and expensive shutdowns, Goetze's No. 2 last for years and may be used over and over again, where other gaskets stand but a few days or weeks.

One of Goetze's No. 2 Gaskets will make a joint tight where several other kinds fail to hold.

FOR STANDARD FLANGED FITTINGS

FOR EXTRA HEAVY FLANGED FITTINGS

Size of Pipe Inches	Size of Gasket Inside, by Outside Diameter, Inches	Price Each	Size of Pipe Inches	Size of Gasket Inside, by Outside Diameter, Inches	Price Each
1	1 1/4 x 2 1/2	\$0.16	1	1 1/4 x 2 1/2	\$0.20
1 1/4	1 1/2 x 2 3/4	.20	1 1/4	1 1/2 x 3 3/8	.27
1 1/2	1 3/4 x 3	.24	1 1/2	1 3/4 x 3 1/2	.30
2	2 1/4 x 4	.32	2	2 1/4 x 4 1/4	.40
2 1/2	2 3/4 x 4 3/4	.40	2 1/2	2 3/4 x 5	.50
3	3 1/4 x 5 1/4	.48	3	3 1/4 x 5 3/8	.60
3 1/2	3 3/4 x 6 1/4	.56	3 1/2	3 3/4 x 6 1/2	.70
4	4 1/4 x 6 3/8	.64	4	4 1/4 x 7	.80
4 1/2	4 3/4 x 6 7/8	.72	4 1/2	4 3/4 x 7 3/8	.90
5	5 1/4 x 7 3/8	.80	5	5 1/4 x 8 3/8	1.00
6	6 1/4 x 8 3/8	.96	6	6 1/4 x 9 3/8	1.20
7	7 1/4 x 9 3/8	1.12	7	7 1/4 x 10 3/8	1.40
8	8 1/4 x 10 3/8	1.28	8	8 1/4 x 12	1.60
9	9 1/4 x 12 3/8	1.44	9	9 1/4 x 13	1.80
10	10 1/4 x 13 1/4	1.60	10	10 1/4 x 14 1/4	2.00
12	12 1/4 x 16	1.92	12	12 1/4 x 16 3/4	2.40
14	14 1/2 x 17 3/8	2.24	14	14 1/2 x 19	2.80
15	15 1/2 x 18 3/8	2.40	15	15 1/2 x 19 3/8	3.00
16	16 1/2 x 20 1/8	2.56	16	16 1/2 x 21 3/8	3.20
18	18 1/2 x 21 1/2	2.88	18	18 1/2 x 23 3/8	3.60
20	20 1/2 x 23 3/4	3.20	20	20 1/2 x 25 1/2	4.00
22	22 1/2 x 25 3/8	3.52	22	22 1/2 x 27 1/2	4.40
24	24 1/2 x 28 1/8	3.84	24	24 1/2 x 30	4.80

When ordering, please give inside and outside diameters required, and state whether for standard flanged fittings, extra heavy flanged fittings, union, companion, male and female or tongue and groove flanges.

Special prices for gaskets larger than 36 inches outside diameter.

"BESTOSKING" GASKETS



FIG. 1669

These gaskets are made from "Bestosking" Wire Inserted Sheet Packing and in any size desired.

4 inches diameter and smaller, price.....per lb. \$2.00
 Larger sizes, price.....per lb. 1.50

RUBBER AND CLOTH INSERTED GASKETS



FIG. 1670

We are prepared to furnish either cut or moulded gaskets in any size desired. Prices depend upon grade, quantity and size of gaskets wanted.

ASBESTOS TAPE
FOR MAKING GASKETS

FIG. 1671

$\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1 and $1\frac{1}{4}$ in. wide. Price.....per lb. \$1.25

ROSE WASHER AND GASKET CUTTER



FIG. 1672

WASHER CUTTERS

No. 0—Cuts $\frac{3}{8}$ to 2 inches.....	each, \$1.15
No. 00—Cuts $\frac{3}{8}$ to 2 inches ox. copper plate	each, 1.50
No. 1—Cuts $\frac{3}{4}$ to $4\frac{1}{2}$ inches.....	each, 3.75
No. 2—Cuts 1 to 10 inches.....	each, 10.00
No. 3—Cuts $4\frac{1}{2}$ to 21 inches.....	each, 23.00
No. 4—Cuts 6 to 36 inches.....	each, 32.00
No. 5—Cuts 1 to 10 inches round or oval.....	each, 36.00
No. 6—Cuts 4 to 21 inches round or oval.....	each, 82.00
Glass cutter attachment.....	each, 2.00
Glass cutter attachment for No. 6.....	each, 3.50

This cut represents Nos. 1 and 2 with automatic feed. Cuts round washers.

No. 350—Single



FIG. 1673

No. 350. Cuts to $6\frac{1}{2}$ in....	per dozen, \$9.00
No. 45. Cuts to 5 in....	per dozen, 23.00
Extra blades	each, .20

No. 45—Double

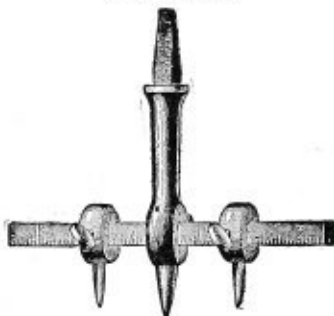


FIG. 1674

20-INCH WASHER CUTTER

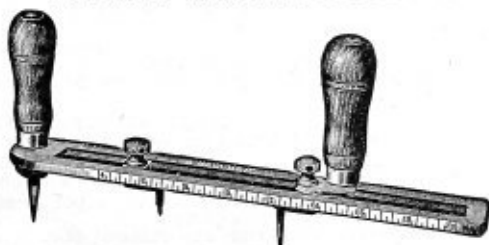


FIG. 1675

Adapted for cutting gaskets 4 to 20 inches in diameter. Weight of package 5 pounds 10 ounces.

Price	per dozen, \$20.00
Price, knives only	per dozen, 3.00
Price, screws only	per dozen, 1.00



RUBBER PUMP VALVES

FIG. 1676

HOT WATER VALVES

STYLE NO. 534. "Flint" superheat valve for 500 lbs. pressure and 300 degrees temperature; for high duty in modern power, heat and light stations.

Priceper lb. \$2.20

STYLE NO. 500. Highest grade and quality hard brown valve; for hot water up to 300 lbs. pressure and 200 to 300 degrees temperature.

Priceper lb. \$1.60

STYLE NO. 510. Hard valve for hot water up to 200 lbs. pressure and 100 degrees temperature; also for oil and acid.

Priceper lb. \$1.56

STYLE NO. 537. Brown hot water valve for medium service.

Priceper lb. \$1.30

MINE PUMP VALVES

STYLE NO. 519. Medium valve for vertical head from 400 to 800 ft. lift.

Priceper lb. \$2.10

STYLE NO. 542. Soft mine valve for all general work in deep mines, slush pumps, etc., up to 400 ft., vertical head.

Priceper lb. \$2.00

COLD WATER VALVES

STYLE NO. 515. Hard valve for cold water, up to 400 lbs. pressure, or warm water up to 100 lbs. pressure, not over 120 degrees temperature.

Priceper lb. \$1.60

STYLE NO. 520. Medium hard valve for cold water only, 150 to 400 lbs. pressure.

Priceper lb. \$1.50

STYLE NO. 525. Medium soft valve for cold water, 160 lbs. pressure; or warm water up to 80 degrees temperature.

Priceper lb. \$1.30

STYLE NO. 530. Soft valve for cold water up to 100 lbs. pressure; or warm water up to 80 degrees temperature.

Priceper lb. \$1.10

STYLE NO. 535. White valve, medium soft, for cold water up to 120 pounds pressure.

Priceper lb. \$1.80

STYLE NO. 533. Highest grade medium soft cold water valve for severe service.

Priceper lb. \$1.60

CONDENSER VALVES

STYLE NO. 545. Red condenser valve made from best grade of fine Para rubber.

Priceper lb. \$3.50

STYLE NO. 576. Oil proof, red condenser valve.

Priceper lb. \$2.10

STYLE NO. 581. Standard gray valve for air pumps and condensers.

Priceper lb. \$2.10

SPECIAL VALVES

STYLE NO. 508. For crude petroleum and mineral oils.

Priceper lb. \$2.10

STYLE NO. 511. Gray valve for beer and mash pumps, high wines, acids, etc.

Priceper lb. \$2.60

STYLE NO. 512. Soft gray valve for molasses, syrups, glucose, etc.

Priceper lb. \$2.10

STYLE NO. 569. Soft gray valve for acid and alkali.

Priceper lb. \$2.30

AIR VALVES

STYLE NO. 560. Soft gray valve for air, very tough.

Priceper lb. \$1.80

Steam Regulator

DIAPHRAGMS

Pump



FIG. 1677



FIG. 1678

STEAM REGULATOR DIAPHRAGMS, HIGH PRESSURE

Number	1	2	3	4
Outside Diameter	6 $\frac{3}{4}$	9	11 $\frac{1}{2}$	15
Price	\$0.55	.85	1.45	2.65

PUMP DIAPHRAGMS

Style of Pump Used on.....	Edison			Loud	
Number of Pump.....	2	3	4	1	2
Outside Diameter	11 $\frac{1}{4}$	13	15	10	13 $\frac{1}{4}$
Hole	4	5	5 $\frac{1}{2}$	4 $\frac{1}{2}$	5 $\frac{3}{4}$
Price	\$2.00	3.00	4.00	2.00	3.00

DIAPHRAGM PACKING

For steam, water and damper regulators, etc. Made of a superior quality of rubber, with a special woven heavy duck insertion, duck one side or duck both sides, any thickness desired, with a superior quality of friction between the plies.

Priceper lb. \$...



FIG. 1679

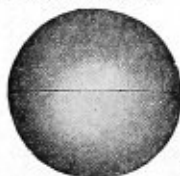
RUBBER VALVE
BALLS

FIG. 1680

Size	1	1 $\frac{1}{8}$	1 $\frac{1}{4}$	1 $\frac{3}{8}$	1 $\frac{1}{2}$	1 $\frac{5}{8}$	1 $\frac{3}{4}$	1 $\frac{7}{8}$	2	2 $\frac{1}{4}$
Price	\$1.00	1.40	1.90	2.50	3.25	4.00	4.75	5.50	6.50	8.00
Size	2 $\frac{1}{2}$	2 $\frac{3}{4}$	3	3 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{3}{4}$	4	4 $\frac{1}{2}$	5	6
Price	\$10.50	13.00	15.50	19.50	23.50	29.25	35.00	54.50	70.00	115.00

BAND SAW BANDS



FIG. 1681

These Bands are made of all rubber or rubber with cloth insertion. Pure Gum Bands are applied under heavy tension and are therefore necessarily in a sensitive state. Much care is required to avoid cutting or other injury. Specific instructions for their application accompany each band.

Apply to the wheel with high grade shellac or best fish glue.

In ordering, please give full measurement of circumference.

**"THERMOID" HYDRAULIC COMPRESSED
BRAKE LINING—100%**



FIG. 1682

**FOR ALL KINDS OF INDUSTRIAL MACHINERY
CRANES, HOISTS, STEAM SHOVELS, DREDGES, TRACTORS,
CLUTCHES, ETC.**

"Thermoid" is the most efficient, has the most uniform gripping power and will outlast any other brake lining or substitute, foreign or domestic. It is flexible and conforms readily to the shape and is easily fitted to the brake band, drum or clutch, always presenting a smooth, uniform wearing and gripping surface.

Because of its denseness, secured by hydraulic compression, the rivet holes can be either punched or drilled and countersunk, affording a secure, safe grip for the rivets.

PRICE LIST PER FT.—ADOPTED 1906

Width Inches	Thickness						
	$\frac{1}{8}$ -in.	$\frac{3}{16}$ -in.	$\frac{1}{4}$ -in.	$\frac{5}{16}$ -in.	$\frac{3}{8}$ -in.	$\frac{7}{16}$ -in.	1-in.
1	\$0.70	.83	.96	1.32	1.48	1.73	2.24
1½	.90	1.13	1.35	1.73	2.12	2.50	3.27
2	1.20	1.47	1.73	2.24	2.76	3.27	4.29
2½	1.50	1.81	2.12	2.76	3.40	4.04	5.32
3	1.70	2.10	2.50	3.27	4.04	4.80	6.34
3½	1.90	2.39	2.88	3.78	4.68	5.57	7.36
4	2.20	2.74	3.27	4.29	5.32	6.38	8.39
4½	2.50	3.08	3.65	4.80	5.96	7.11	9.41
5	2.70	3.37	4.04	5.32	6.60	7.88	10.44
5½	3.01	3.72	4.42	5.83	7.24	8.64	11.46
6	3.27	4.04	4.80	6.34	7.88	9.42	12.48
6½	3.94	4.57	5.19	6.85	8.52	10.18	13.51
7	4.20	4.89	5.57	7.36	9.16	10.95	14.53
7½	4.52	5.24	5.96	7.88	9.80	11.72	15.56
8	4.80	5.57	6.34	8.39	10.44	12.48	16.58
8½	5.09	5.91	6.72	8.90	11.08	13.25	17.60
9	5.38	6.25	7.11	9.41	11.72	14.02	18.63
9½	5.67	6.58	7.49	9.92	12.36	14.79	19.65
10	5.96	6.92	7.88	10.44	13.00	15.56	20.68
10½	6.24	7.25	8.26	10.95	13.64	16.32	21.70
11	6.53	7.59	8.64	11.46	14.28	17.09	22.72
11½	6.82	7.93	9.03	11.97	14.92	17.86	23.75
12	7.11	8.26	9.41	12.48	15.56	18.63	24.77
12½	7.40	8.60	9.80	13.00	16.20	19.40	25.80
13	7.68	8.93	10.18	13.50	16.84	20.16	26.82
13½	7.97	9.27	10.56	14.00	17.48	20.93	27.84
14	8.26	9.61	10.95	14.53	18.12	21.70	28.87
15	8.84	10.28	11.72	15.56	19.40	23.24	30.92
16	9.41	10.95	12.48	16.58	20.68	24.77	32.96
17	9.99	11.62	13.25	17.60	21.96	26.31	35.01
18	10.56	12.29	14.02	18.63	23.24	27.84	37.06
19	11.14	12.97	14.79	19.65	24.52	29.38	39.11
20	11.72	13.64	15.56	20.68	25.80	30.92	41.16

ROUND RUBBER MATS

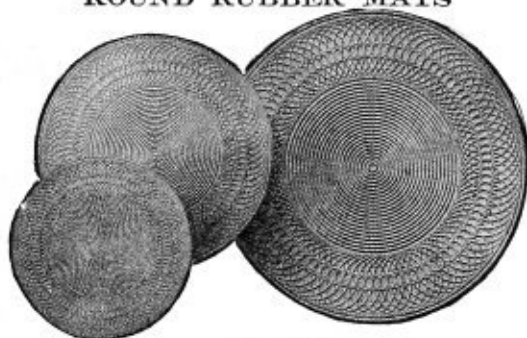


FIG. 1683

Made in attractive design and of excellent quality stock that will last many years.

Regular stock sizes are 6-inch, 9-inch, 12-inch, 15-inch, and 18-inch.

Other sizes made to order.



FIG. 1684

CORRUGATED MATTING

This Matting is made in rolls one yard wide and about fifty yards long. It can be cut to order in any size or shape desired.

Approximate Weights:

Inch thick	Lbs. per sq. yd.	Inch thick	Lbs. per sq. yd.
$\frac{3}{32}$	6	$\frac{1}{8}$	23
$\frac{1}{8}$	8 $\frac{1}{2}$	$\frac{3}{16}$	28
$\frac{1}{4}$	13 $\frac{1}{2}$	$\frac{1}{2}$	32 $\frac{3}{4}$
$\frac{3}{8}$	18 $\frac{1}{4}$	$\frac{3}{4}$	37 $\frac{1}{2}$

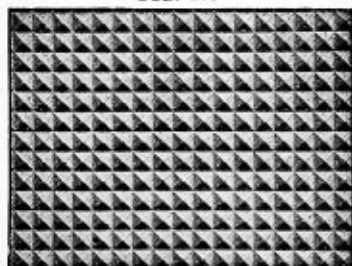


FIG. 1685

PYRAMID MATTING

Minimum Max.
Thickness Width.

Large Pyramid, sharp point.....	$\frac{5}{32}$ "	48"
Large Pyramid, flat top.....	$\frac{1}{8}$ "	48"
Medium Pyramid.....	$\frac{3}{32}$ "	35"

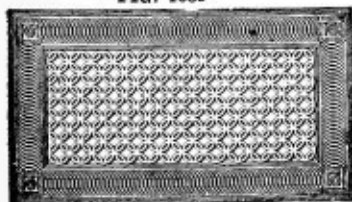


FIG. 1686

MOLDED DOOR MATS

These mats are made in molds and are the most attractive and durable solid back mats on the market. The extent of tread surface insures long life and selection can be made from the following three sizes: 17" x 31", 18" x 36", 20" x 40".

BELT RULES

These rules are based on the following belt speeds equalling one horse-power:

One-inch single belt, 800 feet per minute.

One-inch double belt, 500 feet per minute.

Twenty-five per cent more power can be gotten out of a belt and it may do its work well for a while, but by using the speeds stated above as a basis you will always be on the safe side. The belt will have a reserve force to cover the gradual wear and to prevent its being strained and there will remain a sufficient amount of life and elasticity in the leather to allow for sudden jolts and strains.

It is always best to underestimate the horse-power of a belt. All civil and mechanical engineers in estimating the strength of material, allow a large margin for safety.

There are numerous rules for figuring the problems given under this head, but to avoid confusion we have selected the one covering each point which in our experience is simplest and most accurate. We will state one proposition and use the same for each example.

The driving pulley is forty-eight inches in diameter. It revolves 250 times per minute. The driven pulley is thirty-six inches in diameter. The faces of the pulleys are eight inches wide. The distance between centers twenty-five feet. The diameter of the shaft is two and one-half inches. The belt an eight-inch double.

1. TO FIND THE CIRCUMFERENCE OF A PULLEY

Multiply the diameter by 3.1416 or 3 1-7. 3.1416 is the more accurate.

Example: The diameter of the large pulley being 48 inches, the circumference will be $48 \text{ inches} \times 3.1416 = 150.8 \text{ inches}$. This divided by 12 equals 12.56 feet, the circumference.

2. TO FIND SPEED OF BELT

Find the circumference of the driving pulley in feet. Multiply this by the number of revolutions per minute. The result is the foot speed traveled per minute by the belt.

Example: The circumference of the driving pulley is 12.56 feet and this multiplied by the revolutions $250 = 3,140 \text{ feet}$, or the speed in feet per minute.

3. TO FIND LENGTH OF BELT

Multiply the distance between centers by 2 and add $\frac{1}{2}$ of the combined circumference of the pulleys.

Example:

Distance between centers,
Circumference of large pulley,
Circumference of small pulley,

Circumference combined,
One-half of this amount,

Total length of belt,

$$\begin{array}{r}
 25 \text{ ft.} \times 2 = 50 \text{ ft.} \\
 12.56 \text{ ft.} \\
 9.44 \\
 \hline
 22.00 \text{ ft.} \\
 11 \text{ ft.} = 11 \text{ ft.} \\
 \hline
 61 \text{ ft.}
 \end{array}$$

BELT RULES—CONTINUED

4. TO FIND THE HORSE-POWER TRANSMITTED BY A BELT

Find the speed per minute as explained in Rule No. 2; multiply this by the width of the belt in inches and divide by 800 if the belt is single or by 500 if double.

Example:

Speed as found in Rule No. 2 is	3140 ft.
Multiplied by width of belt,	8 in.
Belt being double divide by	500) 25120
Horse-power transmitted,	50¼ h. p.

5. TO FIND SPEED A BELT MUST TRAVEL TO TRANSMIT ANY REQUIRED HORSE-POWER

Multiply the required horse-power by 800 if single or 500 if double belt and divide by the width of the belt in inches.

Example:

The required horse-power is	50¼ h. p.
Multiplied by	500
Divided by width of belt,	8) 25120
Necessary speed per minute,	3140 ft.

6. TO FIND WIDTH OF BELT NECESSARY TO TRANSMIT ANY GIVEN HORSE-POWER

Multiply the required horse-power by 800 if single or 500 if double belts and divide by the speed per minute.

Example:

The required horse-power,	50¼ h. p.
Multiplied by	500
Divide by speed per minute,	3140) 25120
Gives necessary belt width as	8 in.

7. A SIMPLE RULE

to find transmitting power of belting without first computing the speed in feet per minute.

Multiply the diameter of the driving pulley in inches by the number of its revolutions and this product by the width of the belt in inches. Divide this product by 3050 for single belting or by 1900 for double belting and the result will be the horse-power that can safely be transmitted.

Example:

The diameter of driving pulley,	48 in.
Multiplied by number of revolutions,	250
	12000
Multiplied by width of belt,	8
Divided by	1900) 96000
	50¼ h. p.

8. TO FIND DIAMETER NECESSARY TO MAKE ANY REQUIRED NUMBER OF REVOLUTIONS

Multiply the diameter of pulley whose speed is known by its revolutions and divide by the revolutions at which the other pulley is to run.

Example:

Multiply diameter of large pulley,	48 in.
By the number of its revolutions,	250
Divide by the revolutions at which the other pulley is to run,	333) 12000
The result is necessary diameter,	36 in.

OUR BELT SHOP

For Making New Belts Endless and Repairing Old Ones



FIG. 1687

We have an expert belt maker with capable assistants who can do all inside work, such as repairing, splicing, adding new belts to old, putting on large main drive belts, making endless belting on the pulleys, etc. We solicit repair work, as well as orders for new belts.

METHODS OF LACING BELTING



Outside



Pulley Side



Outside



Pulley Side



Outside



Pulley Side



Outside



Pulley Side

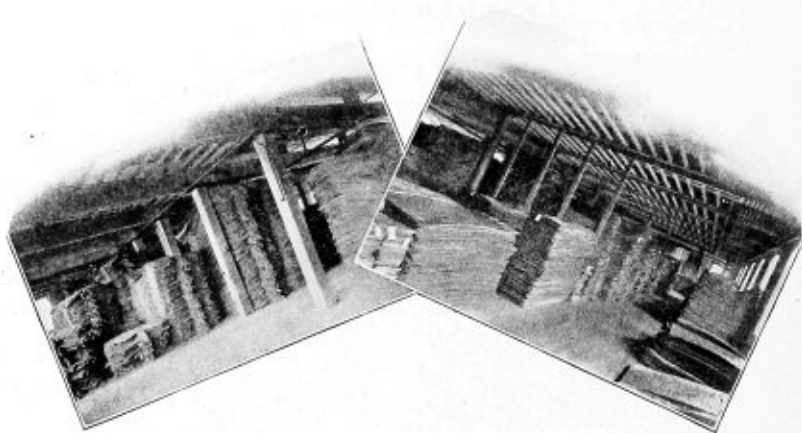
LEATHER BELTING



A VIEW OF THE FACTORY OF I. B. WILLIAMS & SONS IN DOVER, N. H.,
WHERE IS MADE THE LINE OF LEATHER BELTING AND LACE
LEATHER FOR WHICH WE ARE EXCLUSIVE REPRESENTATIVES IN THIS SECTION

Messrs. I. B. Williams & Sons have been making leather belting, lace leather, etc., in this factory since 1842—a period of 75 years of progress and improvement in belt making. Since the first small beginnings, it has been the policy of this house to be known always as “reliable,” to furnish goods exactly as represented. It is their boast that they have never yet wrongly branded or misrepresented belting as to quality. No attempt is made to meet cut price methods by similar methods, but only with a fixed standard of quality—the very best belting that can be produced at the lowest possible prices for such belting.

The factory is one of the largest in the country, devoted to the manufacture of leather belting. It is modernly equipped and there is to be found here at all times a very large stock of finished belting leather as well as belting ready for shipment.

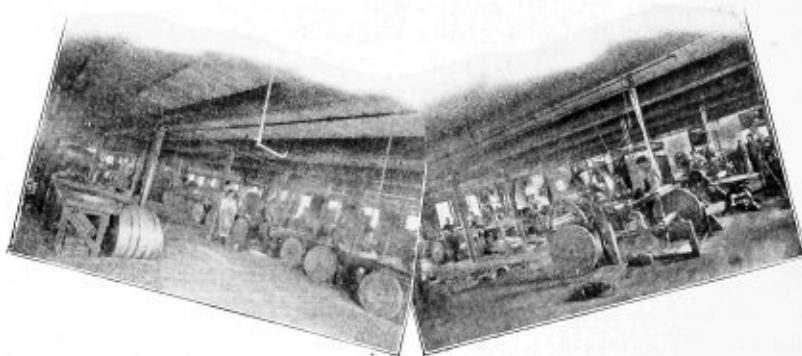


GLIMPSES OF A MODERN LEATHER BELTING PLANT

We call attention particularly to the views shown of the stock of rough butts (unfinished leather) at the left above and of the stock of finished belting leather at the right. Every pound of this immense stock of leather is No. 1 selection, pure oak bark tanned leather, tanned by the long or "lay away" process.

The Williams' process of currying and finishing out belting leather is noted throughout the country, producing, as it does, finished leather as choice and perfect for leather belting as can be made.

It is the use of such leather with the careful, expert workmanship of old experienced belt makers which has given the Williams Belting its high standing among belt users everywhere.



"COCHECO" LEATHER BELTING

EVERY INCH SELECTED FROM THE CHOICEST PART OF THE HIDE

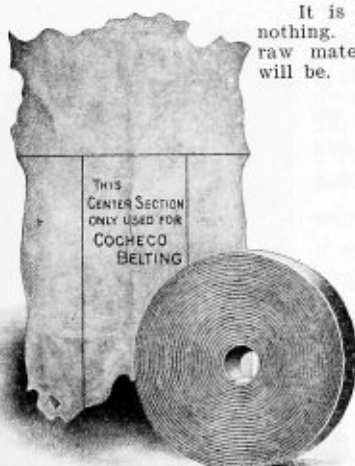


FIG. 1691

It is impossible to make something out of nothing. Under equal conditions, the better the raw materials, the better the finished product will be.

Every inch of Cochecho Belting consists of the choicest selection from the hides—the strip taken from along the backbone. All belts 8-inch and over in width show the spine mark on every section. These strips are the firmest, toughest and most durable leather that it is possible to obtain.

Upon your belting depends the transmission of your plant's power to the working machinery.

Poor belts mean lost power at every turn of every pulley in your plant.

Poor belts mean many breakdowns—lost time—low production and lost profits.

If you wish to utilize every ounce of your power, eliminate breakdowns, and increase your production and profit, use Cochecho Belting.

PRICE LIST, NOVEMBER 21, 1906

Width, Inches	Single, Per. Ft.	Double, Per. Ft.	Width, Inches	Single, Per. Ft.	Double, Per. Ft.	Width, Inches	Single, Per. Ft.	Double, Per. Ft.	Width, Inches	Single, Per. Ft.	Double, Per. Ft.
1½	\$0.12	\$0.24	4	\$0.96	\$1.92	17	\$4.08	\$8.16	36	\$8.64	\$17.28
1¾	.15	.30	4½	1.08	2.16	18	4.32	8.64	38	9.12	18.24
2	.18	.36	5	1.20	2.40	19	4.56	9.12	40	9.60	19.20
2¼	.21	.42	5½	1.32	2.64	20	4.80	9.60	42	10.08	20.16
2½	.24	.48	6	1.44	2.88	21	5.04	10.08	44	10.56	21.12
2¾	.30	.60	6½	1.56	3.12	22	5.28	10.56	46	11.04	22.08
3	.36	.72	7	1.68	3.36	23	5.52	11.04	48	11.52	23.04
3¼	.42	.84	8	1.92	3.84	24	5.76	11.52	50	12.00	24.00
3½	.48	.96	9	2.16	4.32	25	6.00	12.00	52	12.48	24.96
3¾	.54	1.08	10	2.40	4.80	26	6.24	12.48	54	12.96	25.92
4	.60	1.20	11	2.64	5.28	27	6.48	12.96	56	13.44	26.88
4¼	.66	1.32	12	2.88	5.76	28	6.72	13.44	60	14.40	28.80
4½	.72	1.44	13	3.12	6.24	29	6.96	13.92	64	15.36	30.72
4¾	.78	1.56	14	3.36	6.72	30	7.20	14.40	68	16.32	32.64
5	.84	1.68	15	3.60	7.20	32	7.68	15.36	72	17.28	34.56
5¼	.90	1.80	16	3.84	7.68	34	8.16	16.32	.....	.....	.....

"SHEDITE" WATERPROOF AND STEAMPROOF LEATHER BELTING

This is a "special purpose" belting, needed in some parts of nearly every mill, which is equal in quality, in every respect, to our Cochecho Belting. It is made up by our own process perfected through many years, which gives it all the moisture resisting qualities of any belt of any material, yet leaves it with all those superior features peculiar to the oak tanned leather belt. The combination is unbeatable and will, in every instance, give longer and better service and prove far cheaper and more satisfactory in the end than anything else that can be secured for belt drives in wet places.

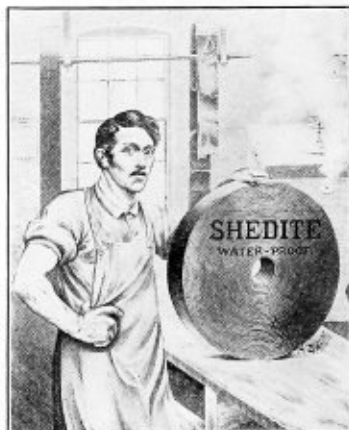


FIG. 1692

"COCHECO" DYNAMO LIGHT DOUBLE LEATHER BELTING

FOR HIGH SPEED DRIVES OVER SMALL PULLEYS

It is most important that belts to be used on small pulleys and at high speeds should not be too thick and heavy, otherwise the belt will not hug the pulleys closely, with a resulting heavy loss in power, and furthermore the belt will not stand up under the sharp bending when going over the small pulleys.

For work of this nature Cochecho Dynamo—which is made in doubles only—is an ideal belt. It is made from the very finest center stock, exactly the same selection of leather as the Heavy Cochecho but from butts of lighter weight. We recommend it highly for all high speed, small pulley drives. Not made in this weight in belts over 22 inches wide.

"DEFIANCE" LEATHER BELTING**A GOOD BELT AT A MODERATE PRICE****FIG. 1693**

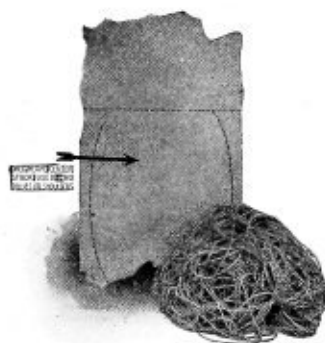
For those who do not want the heaviest and best in leather belting we make the Defiance grade. This belt is cut from stock a little lower down on the side than our Cocheco but is guaranteed entirely free from either belly or shoulder leather. It is a fine, heavy belt, made up with all the care and thoroughness of which we are capable and is fully guaranteed. We recommend it to anyone wanting a medium price belt which will give long service under any reasonable working conditions and do this with entire freedom from troubles and delays. Not made in widths over 8 inches.

"GILT EDGE" OAK ROUND LEATHER BELTING

This round belting, like our Cocheco flat belting, is "center stock" belting. Unlike most others, it is not cut from belly and shoulder leather, but is cut entirely from the center part of heavy belting butts.

It is moreover finished out by all hand work with a care and attention to detail that gives it the perfect shape, finish and strength for which it is famous. It is in a class by itself so far as oak round belting is concerned.

Made only in full round and in sizes $\frac{1}{8}$ in., $\frac{3}{16}$ in., $\frac{1}{4}$ in., $\frac{5}{16}$ in., $\frac{3}{8}$ in.

**FIG. 1694****LIST PRICES OF SOLID, PATENT ROUND AND TWIST LEATHER BELTING**

Size	in.	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
Solid round, oak.....	per ft.	\$0.07	.09	.14	.18	.24	..	..	..	..	..
Patent round, oak.....	per ft.	..	..	..	.22	.27	.38	.48	.60	.80	.96
Twisted, oak.....	per ft.	.08	.12	.17	.22	.27	.38	.48	.60	.80	.96

RUBBER BELTING

IMPORTANT INFORMATION CONCERNING RUBBER BELTING

Plain

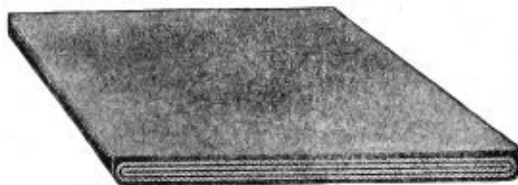


FIG. 1695

Stitched



FIG. 1696

Friction Surface



FIG. 1697

A 4-ply is equal to single and 8-ply to a double leather belt. We seldom recommend heavier than 8-ply rubber belt for any purpose. A thick belt increases the strain on the outer cover, causing belt to separate.

The essential quality in transmission is strength, not bulk. The strength depends entirely on the construction and quality of duck used. The durability and pliability are dependent on quality of rubber in friction and cover. If a belt has high friction, it is better plain than stitched. If low grade with poor friction, it is better stitched than plain.

The duck used in our belting is the best obtainable, woven from the finest quality of cotton, and selected after very careful tests as to strength and texture. Our aim is to give a belt a maximum amount of strength without increasing its thickness.

The absolute uniformity of our belts is assured by our process of manufacture and inspection. Every belt is subjected to a severe test as to the strength of the friction between each ply in pounds, and is closely inspected as to width and thickness.

RUBBER BELTING—CONTINUED**“PARAMOUNT” FRICTION SURFACE**

Made of the heaviest and strongest duck that it is practical to use in a rubber belt for transmission purposes. This duck is manufactured to order from our own formula in such a manner as to reduce the amount of stretch to a minimum and with a view to getting increased strength without too great bulk.

The “friction” or rubber between the plies is very high grade and of such strength as to allow ample margin of safety even where it is called upon to perform the most difficult service.

The friction surface is a strong feature. It enables the belt to “grip” the pulleys making it transmit more power than any other belt of the same width and thickness.

For strength, firmness and durability this belt cannot be equalled.

Every belt is thoroughly tested before it leaves the factory.

“BESTOVALL”

The “BESTOVALL” brand of rubber belting is the very highest grade, made from specially woven heavy cotton duck and the finest grade of rubber. It is recommended for the most severe usage and where belts of other makes have failed. Furnished in either plain or stitched.

“FORT PITT”

This is an especially good value for a medium priced belt. It is constructed of heavy duck and good friction. “Fort Pitt” is not as strong as Bestovall, and should not be used for extra heavy work, but for ordinary service we recommend it as giving excellent satisfaction. This grade is much used on separators, huskers, hullers, stackers, and in factories and mills.

“HELMET” STITCHED BELT

The “Helmet” is a high grade belt in every respect made of our heaviest duck and exceptional quality of friction. It is stitched under uniform tension, the stitches running lengthwise, and serving to hold the plies securely in place. Our method of applying the cover makes a perfectly even driving surface. During the process of manufacture the stretch is practically eliminated.

The proper stitching of a rubber belt is of great importance.

Our thorough study of the subject has enabled us to determine the exact length and tightness of stitch best adapted to obtain the desired result. The absolute uniformity and evenness of stitching throughout the entire length also adds greatly to the durability of our belts.

The “Helmet” is especially designed for hard service in wet places. It is much used in paper mills, for mining purposes, for heavy driving work, on saw mills, in damp climates, and in all places where obliged to come in contact with water or steam.

For List Prices, see following page.

PRICE LIST RUBBER BELTING

Adopted by the Mechanical Rubber Goods Manufacturers' Division of The Rubber Association of America, Inc., May 21, 1918.

Effective July 1, 1918.

Inch	2-Ply	3-Ply	4-Ply	5-Ply	6-Ply	7-Ply	8-Ply	9-Ply	10-Ply	11-Ply	12-Ply
1	\$0.18	.20	.24	....	....	....	....	....	....	....	....
1 1/4	.23	.26	.30	....	....	....	....	....	....	....	....
1 1/2	.27	.31	.36	.45	....	....	....	....	....	....	....
1 3/4	.32	.36	.42	.53	....	....	....	....	....	....	....
2	.34	.39	.46	.58	.69	....	....	....	....	....	....
2 1/2	.42	.48	.56	.70	.84	....	....	....	....	....	....
3	.48	.55	.65	.81	.98	....	....	....	....	....	....
3 1/2	.57	.65	.76	.95	1.14	....	....	....	....	....	....
4	.61	.70	.82	1.03	1.23	1.44	....	....	....	....	....
4 1/2	....	.78	.92	1.15	1.38	1.61	....	....	....	....	....
5	....	.87	1.02	1.28	1.53	1.79	....	....	....	....	....
6	....	1.04	1.22	1.53	1.83	2.14	2.44	2.75	3.06	3.36	3.66
7	....	1.22	1.43	1.79	2.15	2.50	2.86	3.22	3.58	3.94	4.30
8	....	1.31	1.54	1.93	2.31	2.70	3.08	3.47	3.86	4.24	4.62
9	....	....	1.73	2.16	2.60	3.03	3.46	3.89	4.32	4.76	5.20
10	....	....	1.92	2.40	2.88	3.36	3.84	4.32	4.80	5.28	5.76
11	....	....	2.11	2.64	3.17	3.69	4.22	4.75	5.28	5.81	6.34
12	....	....	2.30	2.88	3.45	4.03	4.60	5.18	5.76	6.33	6.90
13	....	....	2.50	3.13	3.75	4.38	5.00	5.63	6.26	6.88	7.50
14	....	....	2.69	3.36	4.04	4.71	5.38	6.05	6.72	7.40	8.08
15	....	....	2.88	3.60	4.32	5.04	5.76	6.48	7.20	7.92	8.64
16	....	....	3.08	3.86	4.62	5.40	6.16	6.94	7.72	8.48	9.24
18	....	....	3.46	4.32	5.20	6.06	6.92	7.78	8.64	9.52	10.40
20	....	....	3.84	4.80	5.76	6.72	7.68	8.64	9.60	10.56	11.52
22	....	....	4.22	5.28	6.34	7.38	8.44	9.50	10.56	11.62	12.68
24	....	....	4.60	5.76	6.90	8.06	9.20	10.36	11.52	12.66	13.80
26	....	....	....	6.26	7.50	8.76	10.00	11.26	12.52	13.76	15.00
28	....	....	....	6.72	8.08	9.42	10.76	12.10	13.44	14.80	16.16
30	....	....	....	7.20	8.64	10.08	11.52	12.96	14.40	15.84	17.28
32	....	....	....	7.72	9.24	10.80	12.32	13.88	15.44	16.96	18.48
34	....	....	....	8.18	9.82	11.46	13.08	14.72	16.36	18.00	19.64
36	....	....	....	8.64	10.40	12.12	13.84	15.56	17.28	19.04	20.80
38	....	....	....	....	10.96	12.78	14.60	16.42	18.24	20.08	21.92
40	....	....	....	....	11.52	13.44	15.36	17.28	19.20	21.12	23.04
42	....	....	....	....	12.10	14.10	16.12	18.14	20.16	22.18	24.20
44	....	....	....	....	12.68	14.76	16.88	19.00	21.12	23.24	25.36
46	....	....	....	....	13.24	15.44	17.64	19.86	22.08	24.28	26.48
48	....	....	....	....	13.80	16.12	18.40	20.72	23.04	25.32	27.60
50	....	....	....	....	14.40	16.82	19.20	21.62	24.04	26.42	28.80
52	....	....	....	....	15.00	17.52	20.00	22.52	25.04	27.52	30.00
54	....	....	....	....	15.58	18.18	20.76	23.36	25.96	28.56	31.16
56	....	....	....	....	16.16	18.84	21.52	24.20	26.88	29.60	32.32
58	....	....	....	....	16.72	19.50	22.28	25.06	27.84	30.64	33.44
60	....	....	....	....	17.28	20.16	23.04	25.92	28.80	31.68	34.56

All other widths and plies at proportionate prices.

Endless belts made to order.

Belts under 12 inches, extra charge of 6 feet; 12 inches and wider, 8 feet.

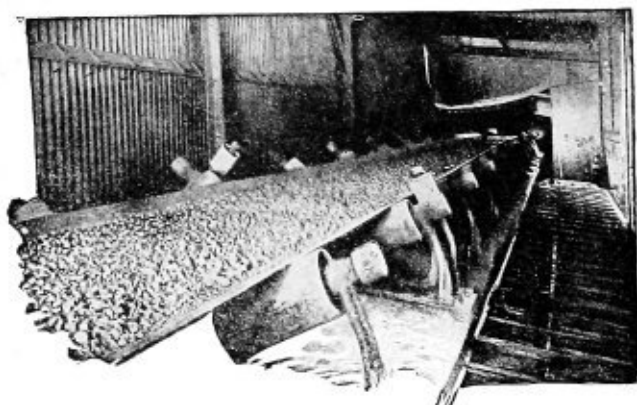


FIG. 1698

"PARAMOUNT" CONVEYOR BELTING

This particularly high-grade belt was originally designed to meet conditions in mines where other belts had failed to give satisfaction, and is regularly fulfilling its commission to date. The canvas has very high warp strength and is impregnated with rubber which holds the plies firmly together. The rubber covers are extra tough and resilient. Any thickness of cover on either the carrying or the pulley side or both will be furnished as required to meet the conditions. We recommend it where the conditions are severe or where a first-class belt is appreciated.

Prices on application.

"FORT PITT" CONVEYOR BELTING

Where belts are more liable to accidental damage or neglect, or the material is not heavy or hard, and a less expensive belt is preferred, we recommend the Fort Pitt. It has good tensile strength and will give satisfaction under ordinary conditions. In zinc and lead mines it is particularly popular and has an excellent record. Thickness of cover dependent upon conditions.

Prices on application.

GENUINE "LANCO" BALATA BELTING



FIG. 1699

Economy and Efficiency Combined. Absolutely Steam, Oil and Water Proof. Cannot be Used in Dry Temperatures of Over 120° F.

"Balata" is a South American Vegetable Gum, applied in liquid form and requires no vulcanizing. Is proof against deterioration and immensely powerful. The fabric of the belt is the finest and heaviest Egyptian Long Fibre Cotton. "Genuine Lanco" is the most powerful belting in the world. Breaking strain, 9,000 lbs. per sq. in. Every belt fully stretched before leaving the factory. Unequaled for heavy duty, hard driving. Unaffected by exposure to the elements, change of temperature, steam, oil, acids and water.

IF BUYING TO REPLACE LEATHER, ORDER

INSTEAD OF LEATHER... USE "LANCO" BALATA...						
	Single 3-Ply	Light Double 4-Ply	Medium Double 5-Ply	Heavy Double 6-Ply	Triple 8-Ply	
Width	3-Ply	4-Ply	5-Ply	6-Ply	7-Ply	8-Ply
1	\$0.18	\$0.24	.....			
1 1/4	.23	.30	.....			
1 1/2	.27	.36	.....			
1 3/4	.32	.42	\$0.53			
2	.36	.48	.60			
2 1/4	.41	.54	.68			
2 1/2	.45	.60	.75			
2 3/4	.50	.66	.83			
3	.54	.72	.90			
3 1/4	.59	.78	.98			
3 1/2	.63	.84	1.05			
3 3/4	.68	.90	1.13			
4	.72	.96	1.20	\$1.44		
4 1/4	.77	1.02	1.28	1.53		
4 1/2	.81	1.08	1.35	1.62		
5	.90	1.20	1.50	1.80		
5 1/2	.99	1.32	1.65	1.98		
6	1.08	1.44	1.80	2.16		
6 1/2	1.17	1.56	1.95	2.34		
7	1.26	1.68	2.10	2.52	\$2.94	\$3.36
7 1/2	1.35	1.80	2.25	2.70	3.15	3.60
8	1.44	1.92	2.40	2.88	3.36	3.84
9	1.62	2.16	2.70	3.24	3.78	4.32
10	1.80	2.40	3.00	3.60	4.20	4.80
11	1.98	2.64	3.30	3.96	4.62	5.28
12	2.16	2.88	3.60	4.32	5.04	5.76
13	2.34	3.12	3.90	4.68	5.46	6.24
14	2.52	3.36	4.20	5.04	5.88	6.72
15	2.70	3.60	4.50	5.40	6.30	7.20
16	2.88	3.84	4.80	5.76	6.72	7.68
17	3.06	4.08	5.10	6.12	7.14	8.16
18	3.24	4.32	5.40	6.48	7.56	8.64
19	3.42	4.56	5.70	6.84	7.98	9.12
20	3.60	4.80	6.00	7.20	8.40	9.60
21	3.78	5.04	6.30	7.56	8.82	10.08
22	3.96	5.28	6.60	7.92	9.24	10.56
23	4.14	5.52	6.90	8.28	9.66	11.04
24	4.32	5.76	7.20	8.64	10.08	11.52

All other sizes
in proportion

CANVAS STITCHED BELTING

For General Transmission and Conveying Purposes

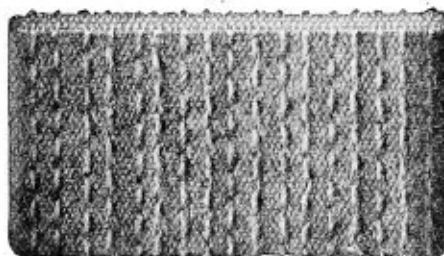


FIG. 1700

This style belt has been in general use many years. It is especially adapted for outdoor work. Four-ply is equal to single; 6-ply, light double, and 8-ply, heavy double leather belt.

“BESTOVALL”

This is a stitched canvas belt from which the stretch has been almost entirely eliminated. Folding and stitching of the canvas is done by machines, constructed and adapted for the purpose and under the direction of experienced hands, insuring a perfect belt, even stitched.

The Bestovall is strong and has a smooth and uniform driving surface. It runs with no slipping, jumping, or uneven motion,—in fact, it is an exceptionally smooth running belt.

We recommend this belt for main driving purposes; it is especially adapted to work in brick yards, cement factories, slaughter houses and quarries.

“GANDY”

This is a well known high grade canvas stitched belt.

“MILO”

Another good brand canvas stitched belt, carrying a guarantee to give satisfaction.

For list prices see following page.

CANVAS STITCHED BELTING

LIST PRICES EFFECTIVE OCTOBER 1ST, 1912

Width, inches	4-ply	5-ply	6-ply	8-ply	10-ply
1	\$0.12	.....	.....	.....	.....
1½	.18	.....	.....	.....	.....
2	.24	\$0.30	\$0.36	.....	.....
2½	.30	.38	.45	.....	.....
3	.35	.44	.53	.....	.....
3½	.39	.49	.59	.....	.....
4	.43	.54	.65	\$0.86	.....
4½	.47	.59	.71	.94	.....
5	.51	.64	.77	1.02	.....
6	.60	.75	.90	1.20	.....
7	.70	.88	1.05	1.40	.....
8	.80	1.00	1.20	1.60	.....
9	.90	1.13	1.35	1.80	.....
10	1.00	1.25	1.50	2.00	.....
11	1.10	1.38	1.65	2.20	.....
12	1.20	1.50	1.80	2.40	\$3.00
13	1.43	1.79	2.15	2.86	3.58
14	1.54	1.93	2.31	3.08	3.85
15	1.65	2.06	2.48	3.30	4.13
16	1.76	2.20	2.64	3.52	4.40
18	1.98	2.48	2.97	3.96	4.95
20	2.20	2.75	3.30	4.40	5.50
22	2.42	3.03	3.63	4.84	6.05
24	2.64	3.30	3.96	5.28	6.60
26	3.12	3.90	4.68	6.24	7.80
28	3.36	4.20	5.04	6.72	8.40
30	3.60	4.50	5.40	7.20	9.00
32	3.84	4.80	5.76	7.68	9.60
34	4.08	5.10	6.12	8.16	10.20
36	4.32	5.40	6.48	8.64	10.80
38	4.94	6.18	7.41	9.88	12.35
40	5.20	6.50	7.80	10.40	13.00
42	5.46	6.83	8.19	10.92	13.65
44	5.72	7.15	8.58	11.44	14.30
46	5.98	7.48	8.97	11.96	14.95
48	6.24	7.80	9.36	12.48	15.60

Charge for splice on endless belts. All belts 16 inches wide or under, 7 feet is the minimum charge. Belts over 16 inches wide, the charge is to be the equivalent of 5 times the width of the belt.

ENDLESS THRESHER BELTS

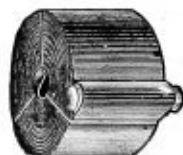


FIG. 1701

Six, seven and eight-inch four-ply threshers belts are made in the following standard lengths: 60, 79, 80, 100, 110, 120, 130, 140, 150, 160 feet.

We also can furnish five and six-ply threshers belts.

BIRD'S "BULLS EYE" BELTING



FIG. 1702

Because of the high adhesive properties peculiar to the heavy gum with which Bird's Bulls Eye Belting is waterproofed, there is an unusual cohesion between belt and pulley—which prevents the belt from slipping even when running loosely.

And more important from a maintenance point of view, this cohesion is permanent and needs no repeated applications of dressing of any kind to keep it in proper condition. It takes care of itself.

In these two respects, Bird's Bulls Eye Belting has been proved to be quite superior to any rubber or stitched canvas belt that is made.

PRICE LIST, SEPTEMBER 15, 1917

PRICES PER FOOT

Width in Ins.	4-ply	6-ply	8-ply	10-ply
1½	\$0.23	.....	.....	.....
2	.30	.....	.....	.....
2½	.38	.....	.....	.....
3	.45	\$0.68	.....	.....
3½	.53	.80	.....	.....
4	.60	.90	\$1.20	.....
4½	.68	1.02	1.36	.....
5	.75	1.13	1.50	.....
6	.90	1.35	1.80	.....
7	1.05	1.58	2.10	.....
8	1.20	1.80	2.40	.....
9	1.35	2.03	2.70	.....
10	1.50	2.25	3.00	.....
12	1.80	2.70	3.60	\$4.50
14	2.24	3.36	4.48	5.60
16	2.56	3.84	5.12	6.40
18	.....	4.32	5.76	7.20
20	.....	4.80	6.40	8.00
22	.....	5.28	7.04	8.80
24	.....	5.76	7.68	9.60
26	.....	6.63	8.84	11.05
28	.....	7.14	9.52	11.96
30	.....	7.65	10.20	12.75
32	.....	8.16	10.88	13.60
34	.....	8.67	11.56	14.45
36	.....	9.18	12.24	15.30
38	.....	10.26	13.68	17.10
40	.....	10.80	14.40	18.00
42	.....	11.34	15.12	18.90
46	.....	12.42	16.56	20.70
48	.....	12.96	17.28	21.60

SOLID COTTON BELTING

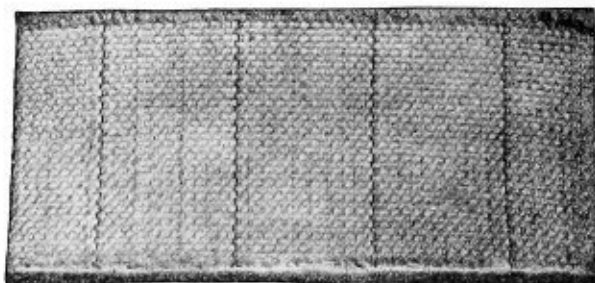


FIG. 1703

The price of solid cotton belting is less than half the price of ordinary rubber. This belt for elevating and conveying purposes is unexcelled.

We do not advise its use, however, over small, rapidly moving pulleys. Neither do we advise its use in damp places, or for heavy loads.

List Prices Per Running Foot, Effective January 1, 1915.

Width Inches	2-Ply	3-Ply	4-Ply	5-Ply	6-Ply	8-Ply	10-Ply
1	\$0.04	\$0.06	\$0.09	\$0.15	\$0.20	\$...	\$...
1¼	.04½	.06½	.10	.16	.22	...	...
1½	.05	.07½	.11	.18	.24	...	...
1¾	.05½	.08½	.12	.19	.29	...	...
2	.06	.09½	.13	.21	.30	.36	...
2½	.07½	.11	.15	.23	.32	.38	...
3	.08½	.13	.18	.26	.34	.41	...
3½	.10	.15	.20	.29	.36	.45	...
4	.11½	.17	.23	.31	.38	.50	...
4½	.13	.19	.26	.33	.41	.55	...
5	.14½	.21	.28	.36	.44	.58	.80
5½	.16	.23	.30	.38	.47	.61	.85
6	.18	.25	.33	.41	.50	.65	.95
7	.21	.29	.38	.48	.58	.75	1.10
8	.23	.33	.44	.55	.65	.85	1.20
9	.26	.37	.50	.61	.73	1.00	1.40
10	.29	.42	.56	.69	.82	1.15	1.60
12	.35	.50	.66	.83	1.00	1.35	1.80
14	.43	.62	.78	.98	1.20	1.60	2.20
16	.49	.72	.90	1.15	1.40	1.95	2.45
18	.57	.82	1.00	1.28	1.55	2.15	2.70
20	.61	.90	1.15	1.45	1.75	2.35	2.95
22	.65	1.00	1.35	1.65	1.95	2.60	3.25
24	.69	1.10	1.55	1.85	2.16	2.85	3.60
26	.77	1.35	1.75	2.00	2.36	3.10	3.90
28	.85	1.50	1.90	2.15	2.60	3.35	4.20
30	.90	1.60	2.10	2.40	2.85	3.60	4.50
32	1.00	1.70	2.25	2.60	3.00	3.85	4.80
34	1.10	1.80	2.40	2.80	3.25	4.10	5.10
36	1.20	1.90	2.50	3.00	3.50	4.35	5.40
38	1.30	2.05	2.65	3.20	3.70	4.60	5.70
40	1.40	2.15	2.80	3.40	3.90	4.85	6.00
42	1.50	2.25	2.90	3.60	4.05	5.10	6.30
44	1.60	2.35	3.05	3.75	4.20	5.45	6.60
48	1.80	2.50	3.20	4.00	4.80	5.80	7.20

Special widths and extra lengths made to order.

"SCANDINAVIA" BELTING



FIG. 1704

"Scandinavia" is a solid woven, cotton fabric. It is made upon power looms and each strand of the cotton is subjected to severe stress during the entire process of weaving. It is not only surface-hardened but is anti-frictioned throughout. The result is a belting having no plies, no stitches, great tensile strength, but little stretch, and a resistance to friction greater than any other belting made of rubber, leather or cotton.

"Scandinavia" is Made up to 66 Inches in Width
 "Scandinavia" Increases in Thickness With Width

SINGLE

Average tensile strength, 1,300 lbs.
 per inch of width.

Average weight per inch of width per
 100 feet, 10 lbs.

Average thickness, $\frac{1}{8}$ of an inch.

TRIPLE

Average tensile strength, 3,000 lbs.
 per inch of width.

Average weight per inch of width per
 100 feet, 20 lbs.

Average thickness, $\frac{1}{4}$ of an inch.

EXTRA STOUT

Average tensile strength, 2,300 lbs.
 per inch of width.

Average weight per inch of width per
 100 feet, 15 lbs.

Average thickness, $\frac{1}{8}$ of an inch.

HEAVY TRIPLE

Varies in weight and thickness ac-
 cording to width.

It is made to order only.

SINGLE, EQUAL TO SINGLE LEATHER, OR 4-PLY STITCHED CANVAS,
 OR RUBBER. 28 CENTS PER INCH OF WIDTH PER FOOT
 ROLLS ABOUT 750 FT. LONG

Size	in.	1	1½	1¾	2	2½	2¾	3	3½	3¾	4	4½	5	5½	6
Per foot.....		\$0.28	.32	.35	.42	.49	.56	.63	.70	.77	.84	.91	.98	1.05	1.12
Size	in.	4¾	4¾	5	5½	6	6½	7	7½	8	9	10	12	14	..
Per foot.....		\$1.19	1.26	1.40	1.54	1.68	1.82	1.96	2.10	2.24	2.52	2.80	3.36	3.92	..

HEAVY SINGLE, EQUAL TO HEAVY LEATHER OR 5-PLY STITCHED
 CANVAS, OR RUBBER. 32 CENTS PER INCH OF WIDTH PER FOOT.
 ROLLS 550 FT. LONG

Size	in.	15	16	18	20	22	24	26	28	30	32	34	36
Per foot.....		\$4.80	5.12	5.76	6.40	7.04	7.68	8.32	8.96	9.60	10.24	10.88	11.52

EXTRA STOUT, EQUAL TO DOUBLE LEATHER, OR 6 AND 7-PLY
 STITCHED CANVAS OR RUBBER. 48 CENTS PER INCH OF WIDTH
 PER FOOT. ROLLS AVERAGE 500 FEET IN LENGTH.

Size..in.	1½	1¾	2	2¼	2½	2¾	3	3¼	3½	4	4½	5	5½
Per foot..	\$0.72	.84	.96	1.08	1.20	1.32	1.44	1.56	1.68	1.92	2.16	2.40	2.64
Size..in.	6	6½	7	8	9	10	11	12	13	14	15	16	17
Per foot..	2.88	3.12	3.36	3.84	4.32	4.80	5.28	5.76	6.24	6.72	7.20	7.68	8.16
Size..in.	18	19	20	21	22	23	24	25	26	27	28	30	31
Per foot..	8.64	9.12	9.60	10.08	10.56	11.04	11.52	12.00	12.48	12.96	13.44	14.40	14.88
Size..in.	32	33	34	35	36	37	38	40	42	48	54	....	....
Per foot..	15.36	15.84	16.32	16.80	17.28	17.76	18.24	19.20	20.16	23.04	25.92	....	....

TRIPLE, EQUAL TO 3-PLY LEATHER, OR 8, 10 OR 12-PLY STITCHED
 CANVAS OR RUBBER. 60 CENTS PER INCH OF WIDTH PER FOOT.
 ROLLS AVERAGE 450 FEET IN LENGTH

Size	in.	4	6	7	8	9	10	11	12	13	14	15
Per foot.....		\$2.40	3.60	4.20	4.80	5.40	6.00	6.60	7.20	7.80	8.40	9.00
Size	in.	16	17	18	19	20	21	22	23	24	25	26
Per foot.....		9.60	10.20	10.80	11.40	12.00	12.60	13.20	13.80	14.40	15.00	15.60
Size	in.	27	28	29	30	31	32	33	34	35	36	....
Per foot.....		16.20	16.80	17.40	18.00	18.60	19.20	19.80	20.40	21.00	21.60	....

"CAMEL HAIR" BELTING



FIG. 1705

When ordering belts give particulars of drives for which they are intended, size of pulleys, and number of feet per minute, and state if tightener is used. In making joints, holes should be back $\frac{3}{4}$ -inch from the ends, and pierced with an awl. Never use a hollow punch, as it cuts the strands and weakens the belt.

Cut the end of a belt true. If edges are not true, or you cannot get a try-square on, it is well for wide belts especially, to take a compass and find the center of the belt about equal distance from the end or place to be cut and sides; with one point of the compass in the center hole, spread it to the edge where it is to be cut; the same distance on the other from the center will give the two points to make a true square.

For joining narrow belts butt the ends together, pierce two rows of holes about $\frac{3}{4}$ -inch back, and lace with best thin rawhide laces, or use our special bolt or metal fasteners.

Begin to lace in the center of the belt and take much care to keep the ends exactly in line, and to lace both sides with equal tightness. The lacing should not be crossed on the side of the belt that runs next to the pulley.

**SINGLE OR LIGHT WEIGHT LIST
CORRESPONDS TO SINGLE LEATHER**

Inches	1½	2	2½	3	3½	4	4½	5	6
Per Foot	\$0.48	.68	.86	1.06	1.26	1.44	1.64	1.82	2.22

**MEDIUM WEIGHT LIST
CORRESPONDS TO LIGHT DOUBLE LEATHER**

Inches				7	8	9	10	11	12
Per Foot				\$2.86	3.26	3.68	4.08	4.50	4.88

For machine shop uses where light double leather is used. Made in above widths only.

**DOUBLE OR FULL WEIGHT
CORRESPONDS TO DOUBLE LEATHER BELT**

Inches	2	2½	3	3½	4	4½	5	6	7	8
Per Foot	\$ 1.10	1.44	1.72	2.10	2.40	2.70	3.00	3.64	4.32	4.90
Inches	9	10	12	14	15	16	18	20	22	24
Per Foot	5.50	6.20	7.40	8.80	9.50	10.30	12.00	13.60	15.40	17.00
Inches	26	30	32	34	36	40	42	44	.....	.....
Per Foot	18.00	22.30	24.00	25.70	27.40	31.00	32.60	34.10	.....	.....

LACE LEATHER



FIG. 1706

"BESTOVALL"

This is a special high-grade Rawhide Lace. It is prepared by the oil process. We carry practically all leading brands of Rawhide Lace Leather, but especially recommend "BESTOVALL" as being the best possible quality. Each side is packed in a paper carton which insures its delivery to user in same condition as it leaves factory.

Price per square foot.....

"COCHECO" RAWHIDE

This brand has in the last twenty-five years become so well known and the quality so honestly maintained that it has grown to be considered as America's standard lace.

Every side of lace is carefully inspected and tested and, if satisfactory, is branded "COCHECO," and when so branded is guaranteed to be as near perfection as rawhide lace leather can be made.

Price per square foot.....

"ORIOLE" TANNED LACE

Is made from the same class of hides as Cochecho rawhide; the method of tanning, however, is entirely different, for the surfaces are tanned and the centers raw. It has all the strength of rawhide and the pliability of buckskin or glove leather.

One of its good qualities is that water does not affect it; it will dry out soft after being thoroughly saturated.

This lace is very handsome, a rich brown in color and its strength is remarkable.

Price per square foot.....

RAWHIDE AND TANNED CUT LACING



FIG. 1707

See descriptions above of Lace Leather in sides. The same applies on cut strips.

Each bundle of "Bestovall" cut lace packed in carton.

Brands and List Per 100 Lineal Feet (Each Strip is About 5 to 6 Feet Long)

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1		
BESTOVALL		\$2.50	3.00	3.75	4.50	5.50	6.50	7.50	10.00
COCHECO		2.50	3.00	3.75	4.50	5.50	6.50	7.50	10.00
ORIOLE		2.50	3.00	3.75	4.50	5.50	6.50	7.50	10.00

HARNESS LEATHER



FIG. 1708

"BESTOVALL"

Under this brand we offer the best selection of oak tanned backs. These backs are straight close trimmed, cut 27 inches wide and contain the very best and choicest part of the hide.

Rolls contain 10 backs each, weight per roll 200 to 250 lbs.

Price, per pound....\$1.00

"FORT PITT"

"FORT PITT" Harness Leather backs is a second selection and will be found very satisfactory for general use.

Rolls contain 10 backs each. Weight per roll 200 to 250 lbs.

Price, per pound....\$0.80

SOLE LEATHER

For Valves, Half Soles, Rough Packing, Etc.



FIG. 1709

Sole Leather is sold either "Oak bark" or "Hemlock tanned." The former is far superior to the latter for general purposes.

We offer the best selection of each grade under the following brands:

	Approx. Wt. per Side	List, Lb.
BESTOVALL—Oak Bark	19 to 20 lbs.	\$1.10
ALLEGHENY—Hemlock	17 to 20 lbs.	.95

BELTINE

THE SCIENTIFIC TREATMENT FOR LEATHER,
CANVAS, FIBER AND RUBBER BELTS



FIG. 1710

BELTINE preserves your belting from interior wear and the harmful action of heat, moisture, dirt and chemical fumes, makes your belting soft and pliable, and overcomes the most obstinate slipping.

BELTINE

MORE THAN DOUBLES THE LIFE OF ANY BELT

Tanning takes the natural lubrication out of leather. After the currier's stuffing begins to work out, friction causes the fibres to wear and become susceptible to the deteriorating influence of change of temperature, moisture, harmful fumes and injurious particles of solid matter. The belt needs treatment with a preparation that acts as a preservative to keep out moisture and destructive gases, and as a lubricant to prevent internal friction, as well as to produce surface adhesion to prevent slipping over the pulleys.

BELTINE is the only belt preparation on the market that combines these three features. It is a scientific treatment that insures the life of your belts and stops transmission loss. It is the perfect product of years of careful research by expert chemists and engineers.

THIS GUARANTEE PROTECTS YOU

The manufacturers of BELTINE hereby guarantee BELTINE to be absolutely free from tar, asphaltum, bitumen, resin, glue, chalk, acid oils, or other ingredients injurious to belts, and should any supply be found not in accordance with this guarantee, they agree to bear all cost of analysis, return all money paid for BELTINE and replace every belt on which the smallest quantity of BELTINE may have been used.

PRICES

1 Gallon Cans, weight 8½ lbs.....	each	\$ 4.00
3 Gallon Cans, weight 25 lbs.....	each	10.00
6 Gallon Cans, weight 50 lbs.....	each	17.50
12 Gallon Kegs, weight 100 lbs.....	each	34.00
½ Barrels, weight 205 lbs.....	per lb.	.32
Barrels, weight 410 lbs.....	per lb.	.30



FIG. 1711

"CLING SURFACE" BELT DRESSING FOR BELTS AND ROPES

Cling-Surface is a special treatment for belts and ropes which makes and keeps them pliable, waterproof and preserved, preventing all drying out or cracking.

It also stops slipping, so all belts and ropes can be run slack and carry full loads.

Cling-Surface can be applied to belts cold and used for all kinds of belts and ropes.

Nothing but Cling-Surface will give these results. It is not sticky, contains no rosin, and has been used all over the world for 20 years.

10 Pound Tins.....	per lb.	\$0.47
25 Pound Tins.....	per lb.	.46
50 Pound Tins.....	per lb.	.45

"STEPHENSON'S" BAR BELT DRESSING FOR ALL KINDS OF BELTS, ROPES, ETC.



FIG. 1712

This dressing is put up in sticks and a different brand is used for the various kinds of belts. It forms a coating and greatly increases the pulley grip, and at the same time decreases the wear on the belt.

Brands	Kind of Belt	No. of 1 Lb. Sticks in Box
RED LABEL	Leather	12 30 50 100
GREEN LABEL	Rubber	.80 .78 .76 .72
BROWN LABEL	Manila Rope	.90 .88 .86 .82



FIG. 1713

"BLACK DIAMOND" BELT DRESSING

FOR LEATHER BELTS USE

- No. 4. Solid (stick) stops slipping and is convenient to use.

FOR RUBBER AND BALATA BELTS USE

- No. 12. Solid (stick) Rubber Belt Dressing stops slipping and is convenient to use.
No. 22. Solid (stick) Balata Dressing stops slipping and is convenient to use.

FOR COTTON, CANVAS, GANDY BELTS USE

- No. 33. Solid (stick) Cotton Belt Dressing.

FOR ROPE DRIVES USE

- No. 36. Solid (stick) Rope Dressing for rope drives, is easy to apply.

Priceper pound \$0.50

DIXON'S SOLID BELT DRESSING



FIG. 1714

Put up in one-pound bars of convenient shape and size. Applied to belts while in motion, stops all slipping instantly. Superior to rosin, tar and vegetable or animal oils. Equally satisfactory for leather, rubber, canvas or fabric belting. Price per case of 25 bars.....per lb. \$0.50

"FORT DUQUESNE" ROPE DRESSING



FIG. 1715

To increase the life of transmission rope, we recommend the use of our specially prepared rope dressing, which keeps the rope soft and pliable and protects it from external or internal friction, heat and moisture. Especially desirable for out-of-door drives. It is molded into sticks of 3 pounds each, of convenient form, and easily applied.

Sticks in box..	1	2	4	8	10
List per box..	\$1.50	3.00	6.00	12.00	15.00



FIG. 1716

"BESTOVALL" BELT CEMENT

For Rubber Belts, Hose, Etc.

A superior article which we guarantee to give satisfaction. Put up in pints, quarts and gallons.

Pints	Price per dozen \$....
Quarts	Price per dozen
Gallons	each



FIG. 1717

"PITZ" BELT CEMENT

For Leather Belts.

"PITZ" Belt Cement is made under our own formula and is composed of the strongest materials known. It will hold better than any cement on the market whether on old or new belts. It is put up in one and five pound cans.

Price per pound.....	\$1.00
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"CRESCENT" BELT FASTENERS

Medium, for General Work

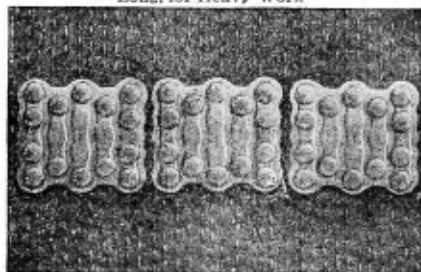
**FIG. 1718**

the slots running lengthwise of the belt. Unlike lace lacing, the "Crescent" method does not remove any material but preserves the full strength of the belt.

"Crescent" Plates are reinforced by lateral embossing and are bent to the approximate periphery of the pulleys on which the various sizes are to be used. They increase the grip by uninterrupted, close adhesion and transmit more of the power on this account.

"Crescent" Plates are attached by simply driving and clinching the special rivets with an ordinary hammer and can be used repeatedly, being practically indestructible. Belts naturally stretch but when joined by the "Crescent" method, this can be remedied by easily and immediately withdrawing the rivets from only one end of the belt, cutting out the natural "slack" or "stretch" and then reuniting by inserting a row of new rivets.

Long, for Heavy Work

**FIG. 1720**

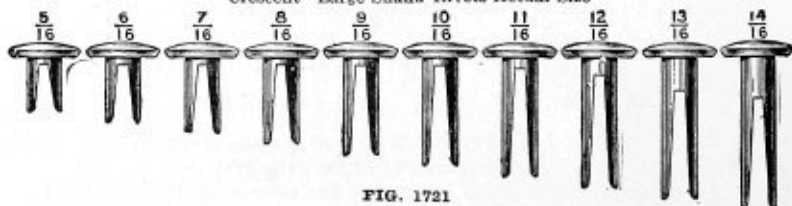
Short, for Light Work

**FIG. 1719**

From the first three illustrations on this page it will be noted that the strain is equally distributed across the entire width of the belt, thus maintaining the maximum strength.

On the pulley side the finished joint is smooth since the prongs of the rivets are firmly imbedded in the belt. There is no knocking on the pulleys.

The illustrations of plates on this page are considerably reduced and are not in proportionate sizes to each other.

"Crescent" Large Shank Rivets Actual Size**FIG. 1721**

For attaching "Crescent" short, medium and long grip plates. They should be used $\frac{3}{16}$ -inch longer than the thickness of the belting to allow for plate and clinch.

"CRESCENT" BELT FASTENERS**"CRESCENT" SHORT GRIP PLATES FOR LIGHT WORK**

Belts 1 to 6 inches wide. Pulleys 3 inches or larger diameter.

Number	25	45	65	85	805
For belts.....inches	$\frac{3}{4}$ and 1	$1\frac{1}{2}$ and 3	2 and 4	$2\frac{1}{2}$ and 5	3 and 6
Price .....per gross	\$2.88	5.76	8.64	11.52	11.52

"CRESCENT" MEDIUM GRIP PLATES FOR GENERAL WORKBelts $1\frac{1}{2}$ to 12 inches wide. Pulleys 5 inches or larger diameter.

Number	67	607	87	107	127	147
Will cover belts.....inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price .....per gross	\$8.64	8.64	11.52	14.40	17.28	20.16

"CRESCENT" LONG GRIP PLATES FOR HEAVY WORK

Belts 5 to 72 inches wide. Pulleys 12 inches or larger diameter.

Number	109	149	1409	189
Will cover width of belt.....inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price .....per gross	\$17.28	23.04	25.92	28.80

"CRESCENT" HIGH SPEED PLATES FOR SPECIAL WORK

For high speed light work on small pulleys and small motor drives.

Number	20	40	44	60	66
Will cover width of belt .....in.	$\frac{3}{4}$ and 1	1 and 2	$1\frac{1}{4}$, $1\frac{1}{2}$ & 3	2 and 4	$1\frac{1}{2}$, 3 and 6
Price .....per gross	\$2.88	5.76	5.76	8.64	8.64

"CRESCENT" JUMBO PLATES FOR EXTREMELY HEAVY WORK

On large pulleys, heavy or uneven strain, large conveyor belts.

Number	1611	2211
Will cover belt .....inches	3	4
Price .....per gross	\$28.80	34.56

"CRESCENT" RIVETS

Lgth. under h'd.in.	$\frac{1}{16}$, 6/16	$\frac{1}{16}$, 8/16	$\frac{1}{16}$, 10/16	$\frac{1}{16}$, 12/16	$\frac{1}{16}$, 14/16	$\frac{1}{16}$, 16/16	18/16
Large shank..gross	\$0.70	.80	.90	1.00	1.10	....	....
Small shank..gross	.50	.55	.60	....	....	....	....
Jumbo .....gross	....	....	1.25	1.40	1.55	1.70	1.85

Attach Crescent short, medium and long grip plates with Crescent large shank rivets $\frac{1}{16}$ -inch longer than thickness of belt.

Attach Crescent high speed plates with Crescent small shank rivets $\frac{1}{16}$ -inch longer than thickness of belt.

Attach Crescent Jumbo plates with Crescent Jumbo rivets $\frac{1}{16}$ -inch longer than thickness of belt.

Rivet Holder
for "Crescent" Rivets



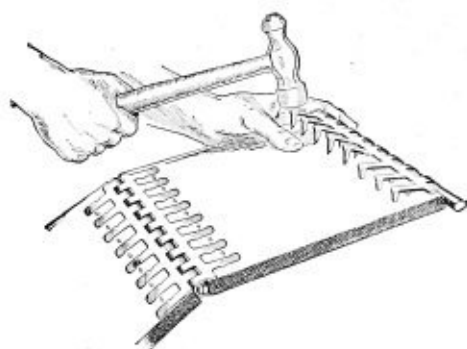
FIG. 1722

Rivet Extractor
for "Crescent" Rivets



FIG. 1723

Price, Rivet Extractors, No. 79.....each, \$1.00
Crescent Rivet Holder included in each box of Crescent Rivets.

"ALLIGATOR" STEEL BELT LACING**"NEVER LETS GO"**

The double row of teeth on both sides of the belt will hold satisfactorily under any conditions of service. A separable lacing, hinging on a rawhide or steel rocker pin. No punch holes required. Works perfectly in contact with an idler.

Section View No. 25.



**NO TOOL
NEEDED
SAVE A
HAMMER**

FIG. 1724

Packed in boxes complete with gauge pin and hinge pins.

No. Lacing	Thickness and Kind of Belting	Will Join in Width	Length of Section	Price
00	Printers' tapes and tape belts up to $\frac{1}{8}$ "	72"	6"	\$1.00
15	Light narrow single leather or fabric, $\frac{1}{8}$ " to $\frac{3}{8}$ "	64"	8"	1.15
20	Single leather, three-ply fabric, etc., up to $\frac{3}{8}$ "	60"	12"	1.15
F25	Single leather and fabric belts from $\frac{1}{8}$ " to $\frac{3}{8}$ " thick	48"	8"	1.15
G25	Single leather and fabric belts from $\frac{1}{8}$ " to $\frac{3}{8}$ " thick	56"	12"	2.25
L27	Leather or 4-ply fabric belts up to $\frac{3}{8}$ "	96"	12"	2.50
M35	Double leather, 5-ply rubber, cotton or balata belts $\frac{1}{8}$ " to $\frac{1}{4}$ "	32"	8"	1.15
N35	Double leather, 5-ply rubber, cotton or balata belts $\frac{1}{8}$ " to $\frac{1}{4}$ "	48"	12"	1.70
U45	Heavy double leather and 6-ply belts up to $\frac{7}{8}$ "	48"	12"	2.25
W55	Rubber, cotton or balata belts up to $\frac{1}{8}$ "	48"	12"	2.60
X65	7 and 8-ply rubber, cotton or balata up to $\frac{1}{2}$ "	48"	12"	3.00
75	For belts $\frac{1}{2}$ " to $\frac{5}{8}$ " thick	48"	12"	4.00

Extra hinge pins which can be cut to suit requirements.

TWISTED RAWHIDE PINS

00 for No.	00	Lacing 12 inch lengths, per dozen	\$0.25
$\frac{1}{8}$	15	" 8 " " " "	.30
$\frac{1}{4}$	20&25	" 8 " " " "	.30
$\frac{3}{8}$	20&25	" 12 " " " "	.45
9/64	27	" 12 " " " "	.50
$\frac{1}{2}$	35	" 8 " " " "	.35
$\frac{3}{4}$	35	" 12 " " " "	.50
$\frac{1}{2}$	45	" 12 " " " "	.60

SECTIONAL STEEL ROCKER PINS

No. 25 size for	No. 20&25	Lacing 12 inch lengths, per dozen	\$0.45
" 27	" 27	" 12 " " " "	.50
" 35	" 35	" 12 " " " "	.50
" 45	" 45	" 12 " " " "	.60
" 65	" 55&65	" 12 " " " "	.70
" 75	" 75	" 12 " " " "	.85

"CLIPPER" BELT LACERS, HOOKS AND SUPPLIES

Facsimile Card of Hooks Ready to Slip in Tool

**FIG. 1725****FIG. 1726**

Tinned Wire Hooks: all orders filled with this style unless otherwise specified.

No.	Description	Price
No. 2	Carded Hooks.....per box	\$1.00
No. 3	" " " " " "	1.25
No. 4	" " " " " "	1.25
No. 5	" " " " " "	1.50
No. 6	" " " " " "	1.75

Each box of Hooks has 14 Rawhide Pins enclosed without extra charge.

TWISTED RAWHIDE PINS 12 INCHES LONG**FIG. 1727****No. 3 Lacer with Head Thrown Back for Easy Insertion of Hooks****FIG. 1728**

It's portable (weighs 24 pounds); made of iron, steel and bronze metal; all working parts tempered and case hardened; should last a lifetime.

Price\$20.00

Each box contains 27 cards of 37 hooks each, will lace 84 inches (in width) both ends of belt, and is put up complete with 14 Rawhide Pins. We send a pair of scissors with each tool for cutting the cards to suit the width of belt to be laced. Cut one edge of card, then the other, and bend slightly back and cut through the center. This can be done without displacing any of the hooks.

No.	Description	Price per Bundle of 24 Pins
13	6/64-in. for Extra Thin Belts.....	\$0.70
12	7/64 " " No. 3 Hooks	.70
11	8/64 " " No. 4 Hooks	.70
10	9/64 " " No. 4 or 5 Hooks	.80
9	10/64 " " No. 5 Hooks	.90
8	11/64 " " No. 6 Hooks	1.00
7	12/64 " " Heavy Belts.....	1.20
5	14/64 " " Ex. Heavy Belts.....	1.60
	Assorted Sizes	.75

BRISTOL'S STEEL BELT LACING



FIG. 1729

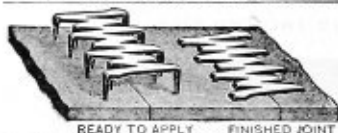
THIS STYLE FOR LEATHER
BELTS ONLY



FIG. 1730

THIS STYLE FOR RUBBER AND
WOVEN BELTS ONLY

No.	Thickness and Kind of Belt	Price Per Box	No.	Thickness and Kind of Belt	Price Per Box
00	For split leather and extra light belts $\frac{1}{16}$ to $\frac{1}{8}$ in. thick	\$1.00	11	For three-ply rubber and cotton belts $\frac{1}{16}$ to $\frac{1}{4}$ in. thick	\$1.50
0	For split leather and light belts $\frac{1}{8}$ to $\frac{1}{16}$ inch thick..	1.00	12	For four-ply rubber and cotton belts $\frac{1}{4}$ to $\frac{1}{16}$ in. thick	2.00
1	For ordinary single leather belts $\frac{1}{16}$ to $\frac{1}{4}$ inch thick..	1.50	13	For five-ply rubber and cotton belts $\frac{1}{16}$ to $\frac{3}{8}$ in. thick	2.50
2	For ex. hvy. and wide single leather belts $\frac{1}{4}$ to $\frac{1}{16}$ in. th'k	2.00	14	For six-ply rubber and cotton belts $\frac{3}{8}$ to $\frac{1}{16}$ inch thick..	3.00
5	For double leather belts $\frac{1}{16}$ to $\frac{3}{8}$ inch thick.....	2.50	15	For seven-ply rubber and cotton belts $\frac{1}{16}$ to $\frac{1}{16}$ inch thick.....	3.50
4	For heavy double leather belts $\frac{3}{8}$ to $\frac{1}{16}$ inch thick..	3.00	17	For eight-ply and extra double heavy rubber and cotton belts $\frac{1}{2}$ to $\frac{3}{8}$ inch thick.....	4.95
5	For ex. heavy double leather belts $\frac{1}{16}$ to $\frac{1}{16}$ inch thick..	3.50	19	For ten-ply and extra heavy conveyor belts from $\frac{1}{16}$ to $\frac{13}{16}$ inch thick.....	6.05
100	For lightest rubber and cotton belts $\frac{1}{16}$ to $\frac{1}{2}$ in. thick	1.00			
10	For two-ply rubber and cotton belts $\frac{1}{8}$ to $\frac{3}{16}$ in. thick	1.00			



THIS STAGGERED POINT STYLE FOR
ALL KINDS OF BELTS

FIG. 1731

No.	Thickness and Kind of Belt	Price Per Box	No.	Thickness and Kind of Belt	Price Per Box
1100	For all kinds of belts $\frac{1}{16}$ to $\frac{1}{2}$ inch thick. Split leather and lightest rubber and cotton belts.....	\$0.90	113	For all kinds of belts $\frac{1}{16}$ to $\frac{1}{2}$ in. thick. Double leather belts and 5-ply rubber and cotton belts.....	\$2.50
110	For all kinds of belts $\frac{1}{8}$ to $\frac{1}{16}$ in. thick. Split leather and light rubber and cotton belts.....	1.00	114	For all kinds of belts $\frac{1}{8}$ to $\frac{1}{16}$ inch thick. Heavy double leather belts and 6-ply rubber and cotton belts.....	\$3.00
110½	For all kinds of belts $\frac{1}{16}$ to $\frac{1}{16}$ inch thick. Light single leather and 2-ply rubber and cotton belts.....	1.25	115	For all kinds of belts $\frac{1}{16}$ to $\frac{1}{16}$ inch thick. Extra heavy double leather and 7-ply rubber and cotton belts.....	3.50
111	For all kinds of belts $\frac{1}{16}$ to $\frac{1}{4}$ inch thick. Ordinary single leather and 3-ply rubber and cotton belts...	1.50	117	For all kinds of belts $\frac{1}{2}$ to $\frac{3}{8}$ inch thick. 8-ply and extra double heavy rubber and cotton belts.....	4.95
112	For all kinds of belts $\frac{1}{4}$ to $\frac{1}{16}$ inch thick. Extra heavy and single leather and 4-ply rubber and cotton belts	2.00	119	For all kinds of belts $\frac{5}{8}$ to $\frac{13}{16}$ inch thick. 10-ply and extra heavy conveyor belts	6.05
					

Each box contains (assorted lengths) enough to lace 100 inches in width of belts.

BRISTOL'S STEEL BELT LACING—CONTINUED

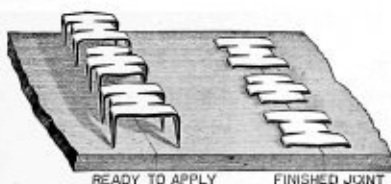


FIG. 1732

Staggered Point Style (3-Point Widths Only).

Each box contains 50 pieces, all 3-point widths.

This Style for all kinds of Belts.

Size No.	Thickness and Kind of Belt	Price Per Box	Size No.	Thickness and Kind of Belt	Price Per Box
3100	For all kinds of Belts from $\frac{1}{8}$ to $\frac{1}{2}$ inch thick. Split Leather and Lightest Rubber and Cotton Belts.	\$0.40	313	For all kinds of Belts from $\frac{1}{8}$ to $\frac{3}{8}$ inch thick. Double Leather Belts and 5-ply Rubber and Cotton Belts	\$1.70
310	For all kinds of Belts from $\frac{1}{4}$ to $\frac{3}{8}$ inch thick. Split Leather and Light Rubber and Cotton Belts	.50	314	For all kinds of Belts from $\frac{3}{8}$ to $\frac{1}{2}$ inch thick. Heavy Double Leather Belts and 6-ply Rubber and Cotton Belts	2.30
310½	For all kinds of Belts from $\frac{3}{8}$ to $\frac{1}{2}$ inch thick. Ordinary Single Leather and 2-ply Rubber and Cotton Belts on small pulleys...	.60	315	For all kinds of Belts from $\frac{1}{2}$ to $\frac{1}{2}$ inch thick. Extra Heavy Double Leather Belts and 7-ply Rubber and Cotton Belts	3.50
311	For all kinds of Belts from $\frac{3}{8}$ to $\frac{1}{2}$ inch thick. Ordinary Single Leather Belts and 3-ply Rubber and Cotton Belts	.70	317	For all kinds of Belts from $\frac{1}{2}$ to $\frac{3}{4}$ inch thick. Conveyor Belts and 8-ply Rubber and Cotton Belts	5.50
312	For all kinds of Belts from $\frac{1}{4}$ to $\frac{1}{2}$ inch thick. Extra Heavy and Wide Single Leather Belts and 4-ply Rubber and Cotton Belts.	1.10	319	For all kinds of Belts from $\frac{3}{4}$ to $1\frac{1}{2}$ inch thick. 10-ply and Extra Heavy Conveyor Belts	9.00

Sizes 315, 317 and 319 are recommended for light, medium and heavy conveyor belts.

"STAG" STEEL BELT HOOKS
FORMERLY STAR

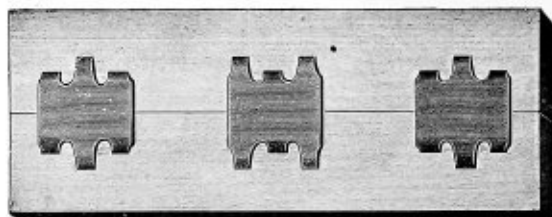


FIG. 1733

The only Zig Zag Hook with solid back. Drives better, holds longer, costs less.

Made in three-point lengths only, enabling the consumer to use only as many as the actual strain on the belt requires. Try this joint in a 3-inch single leather or 3-ply belt of any kind; amply strong for any ordinary strain, and the expense for the 3 No. 1 Stag Hooks used less than one cent. Half the expense of any other hook or lacing. Every Stag Hook is made of the best material possible to obtain, and a guarantee packed in every box.

PRICE LIST

No. 00. For light leather, rubber or cotton belts, $\frac{3}{16}$ x $\frac{1}{8}$ inch thick, $\frac{3}{8}$ to 3 inches wide. Packed 200 in a box.
Per 100\$0.80

No. 0. For light leather, rubber or cotton belts, $\frac{1}{8}$ to $\frac{5}{16}$ inch thick, $\frac{1}{2}$ to 5 inches wide. Packed 200 in a box.
Per 100\$1.00

No. 1. For single leather, 3-ply rubber or cotton belts, 1 to 5 inches wide. Packed 100 in a box.
Per 100\$1.20

No. 2. For heavy single or light double leather, 4-ply rubber or cotton belts, 1 to 8 inches wide. Packed 100 in a box.
Per 100\$2.00

No. 3. For double leather, 4 to 6-ply rubber or cotton belt, 1 to 12 inches wide. Packed 100 in a box.
Per 100\$3.40

No. 4. For heavy double leather, 6 to 8-ply rubber or cotton belt, 1 inch wide and up. Packed 100 in a box.
Per 100\$5.00

No. 5. For extra heavy double leather, 6 to 8-ply rubber or cotton belts, $1\frac{1}{2}$ inches wide and up. Packed 100 in a box.
Per 100\$8.00

No. 6. For extra heavy double leather, rubber or cotton belts, from $\frac{1}{2}$ inch to $1\frac{1}{8}$ inch thick, $1\frac{1}{2}$ inches wide and up. Packed 100 in a box.
Per 100\$11.00

No. 7. For belts $\frac{5}{8}$ to $1\frac{1}{8}$ inch thick and extra heavy conveyor belts, 2 inches wide and up. Packed 100 in a box.
Per 100\$18.00

Each box of Stag will lace from 100 to 200 inches as to size and strain.

"POTTER'S" PATENT IMPROVED BELT HOOKS

MADE ONLY FROM SUPERIOR REFINED IRON.

FOR LEATHER, RUBBER AND COTTON BELTS.

DOUBLE LEATHER AND ALL PLYS OF RUBBER.

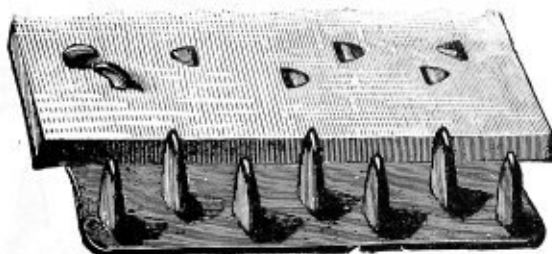


FIG. 1734

FOR SINGLE LEATHER BELTS.

No. 1. For 1 inch belts.....	Per 100, \$1.50	No. 5. For 3 inch belts.....	Per 100, \$3.50
" 2. " 1½ " ".....	" 2.00	" 6. " 3½ " ".....	" 4.50
" 3. " 2 " ".....	" 2.50	" 7. " 4 " ".....	" 5.50
" 4. " 2½ " ".....	" 3.00		

FOR DOUBLE LEATHER BELTS.

No. 8. For 2 inch belts.....	Per 100, \$5.00	No. 11. For 3½ inch belts.....	Per 100, \$8.50
" 9. " 2½ " ".....	" 6.50	" 12. " 4 " ".....	" 9.50
" 10. " 3 " ".....	" 7.50		

FOR 3-PLY RUBBER OR CANVAS BELTS.

No. 26. For 2 inch belts.....	Per 100, \$4.00	No. 20. For 3 inch belts.....	Per 100, \$7.00
" 17. " 2½ " ".....	" 5.00	" 21. " 4 " ".....	" 8.00

FOR 4-PLY RUBBER OR CANVAS BELTS.

No. 13. For 2 inch belts.....	Per 100, \$5.00	No. 15. For 3 inch belts.....	Per 100, \$7.50
" 14. " 2½ " ".....	" 6.50	" 16. " 4 " ".....	" 9.50

FOR OLD 4-PLY RUBBER OR CANVAS BELTS.

No. 27. For 2 inch, extra wide...Per 100, \$ 8.00	No. 19. For 4 inch, extra wide...Per 100, \$12.00
" 18. " 3 " "....." 10.00	

FOR 5 AND 6-PLY RUBBER OR CANVAS BELTS.

No. 22. For 3 inch belts.....Per 100, \$10.00	No. 23. For 4 inch belts.....Per 100, \$12.00
---	---

FOR 7 AND 8-PLY RUBBER OR CANVAS BELTS.

No. 24. For 3 inch belts.....Per 100, \$12.00	No. 25. For 4 inch belts.....Per 100, \$15.00
---	---

FOR EXTRA HEAVY LEATHER, RUBBER OR CANVAS DRIVING BELTS.

Special "AA," teeth, 1 inch long..Per 100, \$33.00	Special "B," teeth, ¾ inch long..Per 100, \$33.00
" "A," " ¾ " " "....." 33.00	

Two or more hooks are used on belts wider than four inches.

PLEASE ORDER BY NUMBER.

"KENEHAN" SOFT STEEL BELT FASTENERS

Made from a specially rolled steel, which insures greatest strength and durability, and are so constructed as to reduce to a minimum the possibility of breaking or tearing out of the belt when properly applied.

Suitable for all kinds, widths and weights of belting, and will be found unexcelled on patent cotton belts, where it is very essential that the fibre is not cut when making a joint.

They run quietly and smoothly on cross belts and over the smallest pulleys. Cuts show exact size.

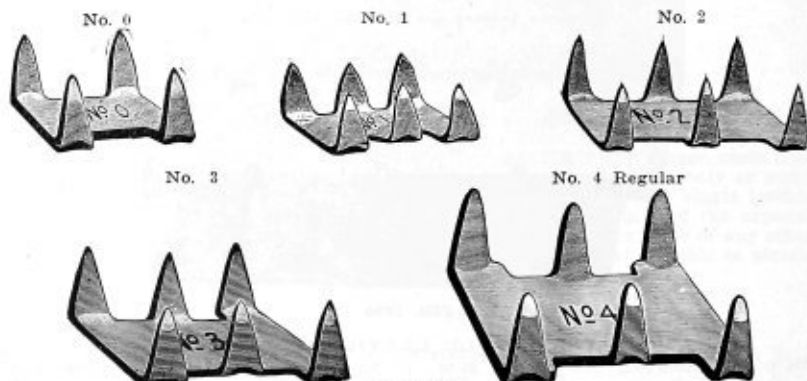


FIG. 1735

Directions for Ordering:

In general, for belts of even inches in width, use fasteners of the even numbers, and for belts of odd inches in width, use fasteners of the odd numbers.

For example, for a 5 inch belt, use Nos. 3 or 5, and for a 6 inch belt, use Nos. 4 or 6, according to thickness of belt. In any case, enough fasteners should be used to go across the belt, allowing about $\frac{1}{2}$ inch between fasteners and come to within $\frac{1}{4}$ inch of either edge.

Nos. 0, 1 and 2 are intended for light, narrow belts running over small pulleys.

Nos. 3 and 4 are suitable for heavy single leather and 3-ply rubber.

Nos. 5 and 6 are used on light double leather and 4-ply rubber up to 10 inches wide.

Nos. 7 and 8 for double leather and 5 or 6-ply rubber.

Nos. 9 and 10 for extra heavy double leather and 8 to 10-ply rubber.

Nos. 12 and 14 are designed for heavy main driving belts up to $\frac{1}{2}$ inch thick.

Sizes	No. 0	1	2	3	4 Regular	4 Narrow	5
Price	per 100	\$0.80	.90	1.20	1.80	2.30	2.70
Sizes	No. 6	7	8	9	10	12	14
Price	per 100	\$3.00	3.90	4.50	4.00	7.00	8.50 10.00

Packed as Follows:

Nos. 0 to 4	100 in a box
Nos. 5 to 10	50 in a box
Nos. 12 and 14	25 in a box

OVAL POINTED BELT HOOK



FIG. 1738

No.	Length	Number in Box	Price Per 1000
15	$\frac{3}{32}$ inch	250	\$ 2.00
14	$\frac{5}{32}$ "	250	2.40
13	$\frac{3}{4}$ "	500	2.60
12	$\frac{5}{16}$ "	250	2.80
11	$\frac{3}{16}$ "	500	3.00
10	$1\frac{1}{32}$ inches	250	3.50
9	$1\frac{1}{8}$ "	250	4.00
8	$1\frac{1}{4}$ "	250	5.00
7	$1\frac{3}{8}$ "	250	6.00
6	$1\frac{3}{4}$ "	250	8.50
5	$2\frac{1}{32}$ "	250	11.00
4	$2\frac{1}{16}$ "	100	14.00
3	$2\frac{1}{8}$ "	100	16.00
2	$2\frac{1}{4}$ "	100	20.00
1	$2\frac{1}{2}$ "	100	30.00
	3 "	100	60.00
	$3\frac{1}{2}$ "	100	70.00
	4 "	100	80.00

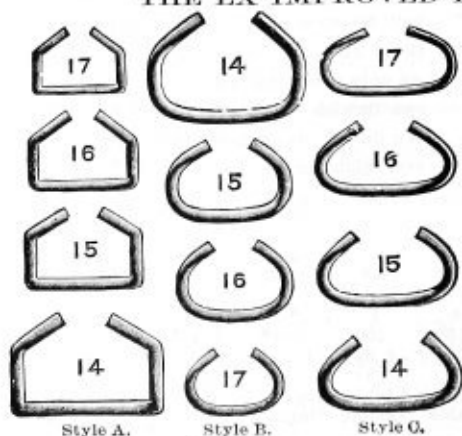
BELT COUPLINGS



FIG. 1739

Size of Couplings	Price Per Dozen
$\frac{1}{8}$ in. Diameter	\$3.00
$\frac{5}{32}$ " "	3.00
$\frac{3}{16}$ " "	2.50
$\frac{7}{32}$ " "	2.50
$\frac{1}{4}$ " "	2.00
$\frac{5}{16}$ " "	2.50
$\frac{3}{8}$ " "	2.50
$\frac{7}{16}$ " "	3.00
$\frac{1}{2}$ " "	3.00
$\frac{5}{8}$ " "	3.50
$\frac{3}{4}$ " "	4.00
$\frac{7}{8}$ " "	4.00
1 " "	5.00
$1\frac{1}{8}$ " "	6.00
$1\frac{1}{4}$ " "	7.50
$1\frac{3}{4}$ " "	9.00
$2\frac{1}{8}$ " "	13.00
$2\frac{1}{4}$ " "	18.00
$2\frac{3}{4}$ " "	22.00
$3\frac{1}{4}$ " "	26.00

THE LX IMPROVED BELT HOOKS



FOR ROUND BELTS

ESPECIALLY ADAPTED TO
SEWING MACHINE
BELTS

500 IN A BOX

PRICE PER 1000

No. 14, for $\frac{3}{8}$ -in. Belt.....\$3.00
 No. 15, for $\frac{1}{2}$ -in. Belt..... 2.50
 No. 16, for $\frac{5}{8}$ -in. Belt..... 2.25
 No. 17, for $\frac{3}{4}$ -in. Belt..... 2.00

FIG. 1740

"GIANT" BELT HOOKS

Cut Full Size of Hooks

FOR COTTON, RUB-
BER, AND LEATHER
BELTS

The "Giant" Belt Hooks have a very high shoulder and will drive without danger of spreading. Points are very sharp and drive easily. The steel is properly tempered to avoid breakage when clinching.



FIG. 1741

Stock No.	Thickness of Belt	List, Per 1,000	No. in Box
F	7 to 10-Ply Cotton or Rubber	\$4.50	250
E	5 or 6-Ply Cotton or Rubber	3.25	250
D	3 or 4-Ply Cotton or Rubber	2.75	250
C	Heavy Double Leather	2.75	250
B	Double Leather	2.25	250
A	Single Leather	2.00	250

Cut Full Size of Fasteners

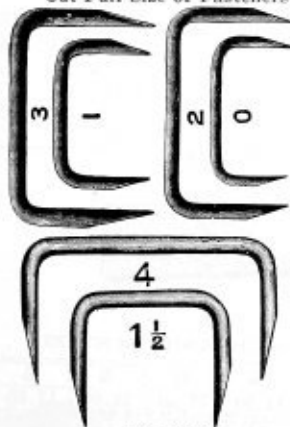


FIG. 1742

"COVEL" BELT FASTENERS

FOR LEATHER, RUBBER, COTTON AND
ALL OTHER KINDS OF BELTS

Covel Belt Hooks are well and favorably known to all belt users. They are applied by driving through belt and clinching.

Stock No.	0	1	1½	2	3	4
List, Per 1,000	\$1.50	1.50	1.50	1.50	1.50	1.50
Thickness of Belt	1/8	1/4	3/8	1/2	3/4	1
Number in box	200	200	200	200	200	200

SPRING PUNCHES



FIG. 1747

No. 275—Single Joint Drive Tubes.....	Per Dozen, \$5.00
Extra Drive Tubes for same.....	Per Dozen, 1.50

REVOLVING PUNCHES



FIG. 1748

Frames, best quality Steel Castings, polished. Tubes are tool steel.	
No. 10—4 Drive Tubes, 1 $\frac{3}{8}$ -in. jaw	Per Dozen, \$ 8.00
No. 11—6 Drive Tubes, 1 $\frac{3}{8}$ -in. jaw	Per Dozen, 10.00
Extra Drive Tubes, for above.....	Per Dozen, 1.50

REVOLVING PUNCHES



FIG. 1749

Frames are drop forged and have extra polish. Checked handles. Tubes finest quality crucible tool steel, straw colored.

No. 116—4 Screw Tubes, 1 $\frac{3}{8}$ -in. jaw	Per Dozen, \$18.00
No. 117—6 Screw Tubes, 1 $\frac{3}{8}$ -in. jaw	Per Dozen, 20.00
Extra Screw Tubes, for above.....	Per Dozen, 2.00

BELT TOOLS

BELT PUNCH AND LACE CUTTER



FIG. 1750

This tool cuts lace leather, punches hole in belt and draws lace through.

PricePer Dozen, \$12.00

IMPROVED BELT PUNCH



FIG. 1751

Catches lace and pulls same through belt. A time-saver.

PricePer Dozen, \$6.00

LATHROP BELT AWL



FIG. 1752

For lacing belts. Price.....Per Dozen, \$6.00

SINGLE EYE BELT AWL



FIG. 1753

Length over all $8\frac{1}{2}$ inches. Price.....Per Dozen, \$6.00

PLIERS AND AWL (COMBINED)



FIG. 1754

For inserting belt studs in belts. Price.....Per Dozen, \$4.80

COMBINATION BELT CUTTER



FIG. 1755

With Adjustable Gage.

(Cutters, awl and pliers in one tool.) Does the work of two tools.

PricePer Dozen, \$18.00

BELT CUTTER



FIG. 1756

For slotting belts to adjust belt studs. Price.....Per Dozen, \$10.80

BELT TOOLS

BELT MARKER



FIG. 1757

For Gaging Distances of Holes

Length, 5¼ inches.

Price per dozen \$3.00

BELT GROOVER



FIG. 1758

Length, 6 inches.

Price per dozen \$6.00

BELT CUTTER AND PLIER

Length, 5½ inches. Nickel plated.

Price per dozen \$9.00



FIG. 1759



FIG. 1760

BELT PUNCH

Length, 7½ inches. Nickel plated.

Price per dozen \$9.00

BELT SLICKER

Price, ebony finish handle.....	per dozen	\$6.50
Price, plain handle	per dozen	6.00
Price, extra blades	per dozen	3.50
Price, extra handles, ebony finish.....	per dozen	3.00
Price, extra handles, plain finish.....	per dozen	2.50



FIG. 1761

HEEL SHAVES



FIG. 1762

Malleable Iron Handles, Adjustable Knife

Price	per dozen	\$12.00
Price, extra heel blades	per dozen	4.65
Price, extra edge blades	per dozen	3.35

GLUE SCRAPER



FIG. 1763

For Removing Glue From Old Belts

Price per dozen \$12.00

BELT TOOLS FINGER STEELS



FIG. 1764

File or plain endsper dozen \$3.00

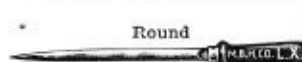


FIG. 1765

TURNING STEELS

Taper



FIG. 1766

Size	inches	8	10	12
Round or Taper	per dozen	\$6.00	7.25	9.00

TURNING STEELS—DOUBLE END



FIG. 1767

Size	inches	12	15
Round or Taper	per dozen	\$10.00	12.00

BELT KNIVES Special Razor Steel



FIG. 1768

Priceper dozen \$2.50

No. 33

BELT HAMMERS

No. 32



FIG. 1769



FIG. 1770

No. 33, Chisel Pier	per dozen	\$10.00
No. 32, Steel Forging	per dozen	6.00



FIG. 1771



FIG. 1772

KEROSENE GLUE POT

Size	pints	1	2	3
Per dozen		\$24.00	27.00	30.00

GLUE BRUSHES

No.		3	4	5
Diameter	inches	1 3/4	2	2 1/4
Length	inches	2 3/4	3	3
Per dozen		\$12.00	16.00	18.00

WIRE BELT LACING

50 Feet Per Box

The methods of lacing belts with wire are so well known that no explanation is necessary. We guarantee our "BESTOVALL" to be the best possible quality.



FIG. 1773

HOW TO ORDER

- No. 0—For 3-Ply Balata and 1 to 2½ Single Leather.
 No. 1—For 4-Ply Balata and 2¾ to 5 Single Leather.
 No. 2—For 5 and 6 Balata and 2 to 8 Double Leather.
 No. 3—For 7 and 8 Balata and 9 and over Double Leather.

Brands	Nos. and List, Per 100 Ft.			
	0	1	2	3
BESTOVALL	\$2.00	2.00	2.00	2.00
KERR'S	2.00	2.00	2.00	2.00
KERR'S A B C	2.00	2.00	2.00	2.00



FIG. 1774

ELLIOTT LACE CUTTER

Cuts any Width from ⅜ to ¾ Inch

Price per dozen \$5.00

DRAW GAGES AND KNIVES

Stock No.	Width Slide	Finish	List, Doz.
451½	4 in.	Japanned	\$16.00
551½	5 in.	Japanned	20.50
651½	6 in.	Japanned	20.50
751½	7 in.	Japanned	24.00
851½	8 in.	Japanned	24.00



FIG. 1775

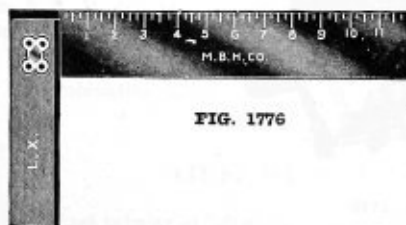


FIG. 1776

BELT SQUARE

12-Inch For Trueing Ends of Belts

Price each \$1.00

BELT PLANE

Price each \$2.00



FIG. 1777

BELT CLAMPS

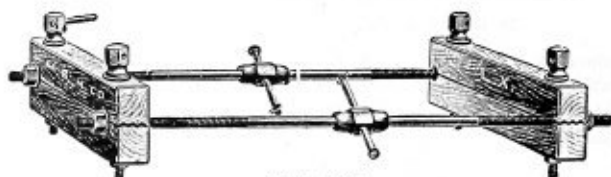


FIG. 1778

No. 270	For belts 6 to 12 in.....	list, each \$ 8.00
No. 271	For belts 12 to 18 in.....	list, each 10.00
No. 272	For belts 18 to 24 in.....	list, each 12.00
No. 273	For belts 24 to 36 in.....	list, each 18.00

Rock Maple Frames and Wrought Iron Screws.

GARDNER & MILLER'S PATENT BELT CLAMPS

MODEL B R

FOR DRAWING BELTS TOGETHER FOR THE PURPOSE
OF LACING THEM

This device is simple, but very efficient. The ends of the belt are placed between the two movable jaws, the upper section of each being in the form of a cam, which automatically closes upon the belt as it is drawn together, giving a pressure sufficient to hold it securely, but without injury to the belt.



FIG. 1779

No.	1	2	3	4	5	6
For Belts	8	12	16	20	24	28
Weight	27	45	59	95	107	148
Price	each \$10.00	15.00	18.00	22.00	26.00	30.00

TUBULAR AND CLINCH RIVETS



FIG. 1780



Fig. 1781



Fig. 1782



FIG. 1783



FIG. 1784

CARTONS, SOLID SIZES

PRICES PER CARTON, JAPANNED OR COPPERED

	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$
No. 1 Tubular, *12-50's.....	\$0.77	.77	.77	.81	.87	.95	1.03	1.09	1.17	1.25	
No. 1 Tubular, *12-100's.....	1.43	1.43	1.43	1.53	1.63	1.78	1.93	2.03	2.13	2.23	
No. 3 Tubular, 12-50's.....	1.20	1.26	1.32	1.38	1.44	1.50	1.56	1.62	1.68		
No. 1 B. P. (clinch), 12-50's.....	.60	.60	.60	.63	.66	.69	.72	.76	.79	.82	
No. 3 B. P. (clinch), 12-50's.....			.96	1.02	1.08	1.14	1.20	1.26	1.32	1.38	

*A carton contains 12 boxes of 50 and 100 rivets each respectively, one length only in a carton.

CARTONS, ASSORTED LENGTHS

PRICES PER CARTON, JAPANNED OR COPPERED

	Assorted	$\frac{3}{16}$ to $\frac{1}{2}$	First Quality	\$0.85
No. 1 Tubular, 12-50's.....	"	"	"	1.60
No. 1 Tubular, 12-100's.....	"	"	"	.90
No. 1 Tubular, *12-50's.....	"	$\frac{3}{16}$ to $\frac{1}{2}$	"	1.70
No. 1 Tubular, *12-100's.....	"	"	"	1.50
No. 3 Tubular, 12-50's.....	"	$\frac{1}{2}$ to $\frac{3}{4}$	"	2.80
No. 3 Tubular, 12-100's.....	"	"	"	.68
No. 1 B. P. (clinch), 12-50's.....	"	$\frac{1}{2}$ to $\frac{3}{4}$	"	1.25
No. 1 B. P. (clinch), 12-100's.....	"	"	"	1.35
No. 3 B. P. (clinch), 12-50's.....	"	$\frac{3}{16}$ to $\frac{1}{2}$	"	1.20
No. 3 B. P. (clinch), 12-100's.....	"	"	"	2.30

*Special assortment, i. e., $\frac{3}{16}$ to $\frac{1}{2}$.

†Combination Carton, i. e., 12 metal boxes in paper carton.

GEM RIVETER

Will set tubular or bifurcated rivets and do the work right.
Adjusts to any length automatically.

Priceper dozen \$9.00



FIG. 1785

COPPER RIVETS AND BURRS

FOR RIVETING BELTS, REPAIRING HARNESS, ETC.

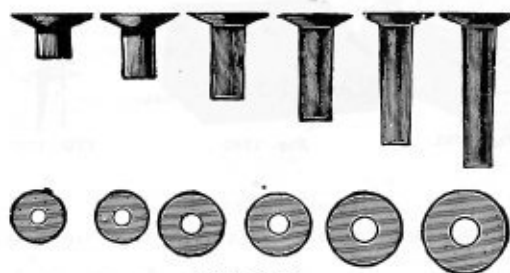


FIG. 1786

Numbers	3-7 incl.	8	9	10	11	12	13	14	15
In Bulk	49	50	52	54	56	58	60	65	70c lb
Uniform lengths, packed in 1-lb. or 4-lb. boxes	49	50	52	54	56	58	60	65	70c "
Uniform lengths, packed in ½-lb. or ¾- lb. boxes	52	53	55	57	59	61	63	68	73c "
Uniform lengths, packed in ¼-lb. boxes	55	56	58	60	62	64	66	71	76c "
Assorted lengths, ⅜ to ¾-inch, packed in 1-lb. boxes	52	53	55	57	59	61	63	68	73c "
Assorted lengths, ⅜ to ¾-inch, packed in ½ or ¾-lb. boxes	55	56	58	60	62	64	66	71	76c "
Assorted lengths, ⅜ to ¾-inch, packed in ¼-lb. boxes	57	58	60	62	64	66	68	73	78c "

TABLE SHOWING NUMBER OF COPPER-BELT
RIVETS AND BURRS TO THE POUND

No.	¾"	⅝"	⅜"	⅜"	½"	⅝"	¾"	¾"	¾"	1"	1¼"	1½"	1½"	Burrs only
4	...	...	...	...	48	...	46	43	41	34	32	30	26	76
5	...	...	...	...	64	60	56	50	48	44	40	36	32	88
6	...	...	128	110	90	88	78	68	64	56	52	48	44	184
7	208	192	168	158	152	124	120	104	96	88	80	72	64	352
8	246	240	208	200	168	152	136	120	104	96	88	84	...	400
9	368	320	256	250	232	200	192	168	144	130	124	113	99	560
10	379	352	320	290	256	240	216	184	160	142	...	...	...	768
11	480	400	368	320	304	264	224	216	...	...	...	...	...	928
12	496	432	408	368	336	304	272	232	208	192	...	...	...	1024
13	800	640	528	480	432	416	386	320	288	...	...	...	...	1472
14	1024	928	768	704	608	550	544	480	384	...	...	...	...	2048
15	1248	1024	983	...	736	...	640	576	...	...	...	...	...	3392

COPPER AND BRASS WASHERS



FIG. 1737

In Bulk and in 1 and 5-pound Paper Cartons

COPPER

For Bolt, Inches	Outside Diam. in Inches	Thickness in Inches	For Bolt, Inches	Outside Diam. in Inches	Thickness
$\frac{1}{16}$	$\frac{1}{2}$	.050	$\frac{3}{8}$	1	$\frac{1}{16}$ inch
$\frac{1}{8}$	$\frac{5}{8}$	.045	$\frac{1}{2}$	$1\frac{3}{8}$	12 B. & S. Ga.
$\frac{1}{4}$	$\frac{3}{4}$	.053	$\frac{5}{8}$	$1\frac{1}{2}$	10 B. & S. Ga.
$\frac{3}{8}$	$\frac{7}{8}$	.065	$\frac{3}{4}$	2	10 B. & S. Ga.
$\frac{1}{2}$	$1\frac{1}{8}$	.068	$\frac{7}{8}$	$2\frac{1}{4}$	9 B. & S. Ga.
$\frac{5}{8}$	$\frac{3}{4}$	$\frac{1}{16}$	1	$2\frac{1}{2}$	9 B. & S. Ga.

BRASS

For Bolt, Inches	Outside Diam. in Inches	Thickness in Inches	For Bolt, Inches	Outside Diam. in Inches	Thickness
$\frac{1}{8}$	$\frac{1}{4}$	.025	$\frac{3}{8}$	1	$\frac{1}{16}$ inch
$\frac{1}{4}$	$\frac{1}{2}$	.050	$\frac{1}{2}$	$1\frac{3}{8}$	12 B. & S. Ga.
$\frac{3}{8}$	$\frac{3}{4}$	.050	$\frac{5}{8}$	$1\frac{1}{2}$	10 B. & S. Ga.
$\frac{1}{2}$	$\frac{7}{8}$	.065	$\frac{3}{4}$	2	10 B. & S. Ga.
$\frac{3}{4}$	$1\frac{1}{8}$	$\frac{1}{16}$	$\frac{7}{8}$	$2\frac{1}{4}$	9 B. & S. Ga.
$\frac{5}{8}$	$\frac{3}{4}$	$\frac{1}{16}$	1	$2\frac{1}{2}$	9 B. & S. Ga.

Also Nos. 5, 6, 7, 8, 9, 10 and 12 Brass Burs
Prices quoted upon application

RIVET SET AND HEADER

FOR SETTING IRON AND COPPER RIVETS



FIG. 1738

Stock No.	Size of Holes	For Iron Rivets	For Copper Rivets, Nos.	List, Per Doz.
00	$\frac{1}{16}$ in.	14 oz.	....	\$9.00
0	$\frac{3}{32}$ in.	10 & 12 oz.	5	9.00
1	$\frac{1}{4}$ in.	8 oz.	6	7.50
2	3 Ga.	6 oz.	7	7.50
3	9 Ga.	4 & 5 oz.	8	6.00
4	15 Ga.	$2\frac{1}{2}$ & 3 oz.	9	6.00
5	21 Ga.	2 oz.	10 & 11	4.50
6	27 Ga.	$1\frac{1}{2}$ oz.	12	4.50
7	33 Ga.	$1\frac{1}{4}$ oz.	13	3.75
8	39 Ga.	1 oz.	14	3.75

Above packed 1 doz. in a box.



PEERLESS BELT LACING MACHINE

A 10-inch belt can be laced in five minutes at a cost of two cents.

The joint being a perfect hinge, passes over the smallest pulleys noiselessly and without slippage, thus reducing the vibration and wear on the boxes and shafting to a minimum.

FIG. 1789

4-inch (portable), for lacing single or double belts up to 4 inches wide, with 4,000 inches coil lacing.....\$55.00

6-inch (on stand), for lacing single or double belts up to 6 inches wide, with 6,000 inches coil lacing.....\$0.00

8-inch (on stand), for lacing single or double belts up to 8 inches wide, with 8,000 inches coil lacing.....\$0.00

With each machine is furnished, in addition to the coil lacing, 2 dozen spiral needles, 500 inches rawhide pins, 1 ball twine, 1 pair cutting pliers, 1 file and handle, 1 threader and 1 needle holder.

For use in damp or wet places we furnish brass coil lacing in place of the steel, but only one-half the quantity.

To lace the same amount of belting with lace leather as can be laced with the quantity of coil lacing furnished with each machine would require an actual outlay of SEVENTY-FIVE DOLLARS, which WILL PAY THE COST OF AN 8-INCH MACHINE.

PRICE LIST OF SUPPLIES

Coil Lacing, per box (containing 1,000 inches)	\$1.15
Coil Lacing, Brass, per box (containing 1,000 inches)	5.00
Spiral Needles, per dozen	.35

12-inch (on stand), for lacing single or double belts up to 12 inches wide, with 4,000 inches coil lacing.....\$100.00

18-inch (on stand), for lacing single or double belts up to 18 inches wide, with 8,000 inches coil lacing

24-inch, for lacing single or double belts up to 24 inches wide, with 8,000 inches of coil lacing..... 140.00

Power attachment, extra

12.50

Rawhide Pins, per bundle (containing 1,000 inches)

Steel Pins (containing 1,000 inches).....

Coupling Twine, per ball

Cutting Pliers, per pair

PORTABLE SHAFT KEYSEATERS

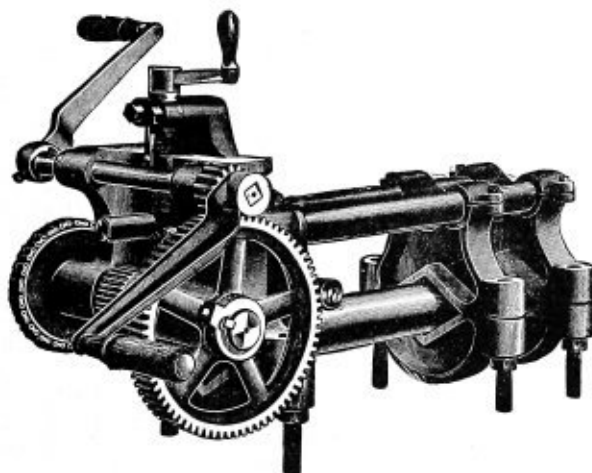


FIG. 1790

CUT SHOWS NO. 2 SIZE

These machines are invaluable in mill erection, repair and alternation work. They may be slipped over shafting already erected and keyseats milled with no delay and at the very smallest expense. A set of cutters is furnished with each machine.

SPECIFICATIONS

Number	1	2	3
Will keyseat shafting to.....inches	5	8	12
Will mill at each setting.....inches	12	12	12
Number of cutters in set.....	5	6	7
Will mill, varying by sixteenths.....	$\frac{1}{4}$ -1 $\frac{1}{2}$	$\frac{1}{4}$ -1 $\frac{1}{2}$	$\frac{1}{4}$ -2 $\frac{1}{2}$
Shipping weight .....pounds	100	250	450
Price, complete .....net	\$55.00	95.00	150.00

COLD ROLLED STEEL SHAFTING

FIG. 1791

Bars 5 to 24 feet long, inclusive.

Diameter		Wt. per Foot.	Price per Pound	Diameter		Wt. per Foot.	Price per Pound	Diameter		Wt. per Foot.	Price per Pound
Inches	M. M.			Inches	M. M.			Inches	M. M.		
3/8	4.76	.095	\$0.07 1/2	1 1/8	26.99	3.02	\$0.05 1/2	2 1/8	65.09	17.55	\$0.05
7/16	5.56	.130	.07 1/2	1 1/4	27.38	3.11	.05 1/2	2 3/8	66.68	18.41	.05
1/2	6.35	.167	.06 1/2	1 3/8	27.78	3.20	.05 1/2	2 1/2	68.26	19.31	.05
5/8	7.94	.260	.06 1/2	1 1/2	28.58	3.38	.05 1/2	2 3/4	69.85	20.21	.05
3/4	8.73	.320	.06 1/2	1 5/8	29.37	3.58	.05 1/2	2 7/8	71.44	21.15	.05
7/8	9.53	.375	.06 1/2	1 3/4	30.16	3.77	.05 1/2	2 3/4	73.03	22.09	.05
1	10.32	.450	.06 1/2	1 7/8	30.48	3.86	.05 1/2	2 7/8	74.61	23.06	.05
1 1/16	11.11	.511	.06	1 7/8	30.96	4.02	.05 1/2	3	76.2	24.05	.05
1 1/8	11.90	.586	.06	1 3/4	31.75	4.17	.05 1/2	3 1/8	79.38	26.09	.05 1/2
1 1/4	12.7	.667	.06	1 3/4	32.54	4.40	.05 1/2	3 1/4	80.96	27.16	.05 1/2
1 1/2	13.49	.757	.06	1 3/4	33.43	4.61	.05 1/2	3 1/2	82.55	28.22	.05 1/2
1 3/8	14.29	.845	.06	1 3/8	34.93	5.05	.05 1/2	3 3/8	85.73	30.43	.05 1/2
1 3/4	15.08	1.00	.06	1 3/8	35.72	5.26	.05 1/2	3 3/4	87.31	31.58	.05 1/2
1 7/8	15.88	1.05	.05 3/4	1 3/8	36.51	5.52	.05 1/2	3 1/2	88.9	32.73	.05 3/4
2	16.27	1.11	.05 3/4	1 3/8	37.31	5.60	.05 1/2	3 3/8	90.49	34.00	.05 3/4
2 1/16	16.67	1.17	.05 3/4	1 3/8	38.1	6.01	.05 1/2	3 3/8	92.08	35.20	.05 3/4
2 1/8	17.07	1.22	.05 3/4	1 3/8	39.69	6.52	.05 1/2	3 3/8	93.66	36.40	.05 3/4
2 1/4	17.46	1.26	.05 3/4	1 3/8	41.28	7.06	.05 1/2	3 3/8	95.25	37.57	.05 3/4
2 1/2	18.26	1.38	.05 3/4	1 3/8	42.86	7.61	.05 1/2	3 3/8	98.43	39.40	.05 3/4
2 3/8	18.65	1.43	.05 3/4	1 3/8	44.45	8.18	.05 1/2	3 3/8	100.01	41.04	.05 3/4
2 3/4	19.05	1.50	.05 1/2	1 3/8	46.04	8.78	.05 1/2	4	101.6	42.75	.06
2 7/8	19.84	1.59	.05 1/2	1 3/8	46.83	9.10	.05 1/2	4 1/8	106.36	46.65	.06
3	20.24	1.68	.05 1/2	1 3/8	47.63	9.39	.05 1/2	4 1/4	107.95	48.26	.06
3 1/16	20.64	1.77	.05 1/2	1 3/8	49.21	10.03	.05 1/2	4 1/8	112.71	52.62	.06
3 1/8	21.03	1.90	.05 1/2	2	50.8	10.69	.05	4 1/2	114.3	54.11	.06 1/2
3 1/4	21.43	1.94	.05 1/2	2 1/8	52.39	11.35	.05	4 3/4	120.65	60.88	.06 1/2
3 1/2	22.23	2.05	.05 1/2	2 1/8	53.98	12.07	.05	4 3/4	125.41	65.50	.06 1/2
3 3/8	23.02	2.20	.05 1/2	2 1/8	55.56	12.80	.05	5	127	67.45	.07
3 3/4	23.42	2.27	.05 1/2	2 1/8	57.15	13.52	.05	5 1/8	138.11	78.95	.07
3 7/8	23.81	2.35	.05 1/2	2 3/8	58.74	14.35	.05	5 1/2	139.7	80.77	.07 3/4
4	24.61	2.52	.05 1/2	2 3/8	60.33	15.07	.05	5 3/8	150.81	94.14	.07 3/4
4 1/16	25.4	2.68	.05 1/2	2 3/8	61.91	15.89	.05	6	152.4	96.14	.08 1/2
4 1/8	26.19	2.85	.05 1/2	2 3/8	63.5	16.70	.05	6 1/2	.....	.....	.09

EXTRAS FOR SHORT AND LONG LENGTHS

For Shafts 3 inches to 5 3/4 inches long, 1 cent per pound net extra.

For Shafts 6 inches to 11 3/4 inches long, 1/2 cent per pound net extra.

For Shafts 12 inches to 23 3/4 inches long, 1/4 cent per pound net extra.

For Shafts 24 inches to 59 3/4 inches long, 1/10 cent per pound net extra.

For Shafts shorter than 3 inches special prices will be quoted.

For Shafts over 24 feet long and less than 30 feet, 1/2 cent per pound net extra.

For Shafts 30 feet long and less than 35 feet, 1 cent per pound net extra.

For Shafts 35 feet long and less than 40 feet, 1 1/2 cents per pound net extra.

For Shafts 40 feet long and less than 45 feet, 2 cents per pound net extra.

For Shafts 45 feet long and over, 2 1/2 cents per pound net extra.

We recommend that all less than carload shipments be boxed, and unless otherwise specified, shipments of this kind will be boxed, and the boxing charged for at cost.

Shafts shipped by local freight without being boxed may be bent or damaged while being handled in transit.

For Quantity Differentials, see following page.

COLD ROLLED STEEL
HEXAGON, SPECIAL STEEL FOR SCREWS
SQUARE, FOR KEYS, SPLINES AND SQUARE SHAFTS

HEXAGON						SQUARE					
Size Inches	Weight per Foot Pounds	Price per Pound	Size Inches	Weight per Foot Pounds	Price per Pound	Size Inches	Weight per Foot Pounds	Price per Pound	Size Inches	Weight per Foot Pounds	Price per Pound
1	.183	.10	1 1/4	4.60	.07	2 1/4	14.85	.08	1 1/2	4.31	.07
1 1/8	.29	.10	1 3/4	5.07	.07	2 3/4	15.80	.08	1 3/4	5.32	.07
1 1/4	.41	.09	1 7/8	5.57	.07	2 7/8	16.58	.08	1 7/8	6.43	.07
1 1/2	.56	.09	2	6.07	.07	3	17.50	.08	2	7.65	.07
1 3/4	.74	.08 1/2	2 1/8	6.62	.07	3 1/8	18.37	.08 1/2	2 1/8	8.98	.07
1 7/8	.93	.08 1/2	2 1/4	7.17	.07	3 1/4	19.35	.08 1/2	2 1/4	10.42	.07
2	1.15	.08 1/2	2 3/8	7.76	.07	3 3/8	20.25	.08 1/2	2 3/8	13.61	.07
2 1/8	1.40	.07 3/4	2 1/2	8.37	.07	3 1/2	21.25	.08 1/2	2 1/2	17.22	.08
2 1/4	1.66	.07 3/4	2 3/4	9	.07	3 3/4	22.25	.08 1/2	2 3/4	21.26	.08 1/2
2 1/2	1.91	.07 3/4	3	9.67	.07	3 7/8	23.28	.08 1/2	3	25.72	.08 1/2
2 3/4	2.25	.07	3 1/8	10.32	.07	3 7/8	24.31	.08 1/2	3 1/8	30.61	.08 1/2
3	2.58	.07	3 1/4	11	.07	3 3/4	25.38	.08 1/2	3 1/4	35.93	.09
3 1/8	2.94	.07	3 3/8	11.70	.07	3 7/8	26.45	.08 1/2	3 3/8	41.67	.09
3 1/4	3.32	.07	3 7/8	12.51	.08	4	28.50	.09	3 7/8	47.84	.09
3 1/2	3.73	.07	4	13.27	.08	4 1/8			4	54.42	.09
3 3/4	4.15	.07	4 1/8	14.08	.08	4 1/4					

The above prices are in stock length bars.

On squares 2 1/4 inches and larger, the corners are slightly rounded; all sizes below 2 1/4 inches have sharp corners. All sizes are accurately rolled.

For bars cut to exact lengths a reasonable charge will be made for labor and waste.

FLATS
Prices Given Are in Cents per Pound.

Thickness Inches	WIDTH, INCHES					
	1/2 to 1 1/2	1 1/2 to 2 1/2	2 1/2 to 3 1/2	3 1/2 to 4 1/2	4 1/2 to 5 1/2	Over 5 1/2
1/8 and 1/4	.18	.18	.14	.12	.10	.10
3/8 to 1/2	.16	.16	.12	.10	.08	.10
5/8 " 3/4	.14	.14	.10	.10	.08	.10
1 " 1 1/8	..	.10	.08	.08	.08	.10
1 1/4 " 1 1/2	..	.10	.08	.08	.08	.10
1 3/4 " 2	..	..	.08	.08	.08	.10
2 " 2 1/8	..	..	..	.08	.08	.10
2 1/4 " 2 1/2	..	..	..	..	.08	.10
2 3/4 " 3	..	..	..	..	.08	.10
3 " 3 1/8	..	..	..	..	.08	.10

EXTRA FOR LONG AND SHORT LENGTHS

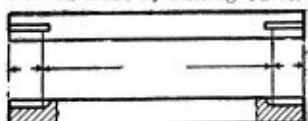
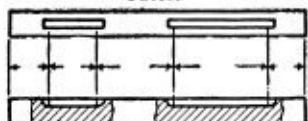
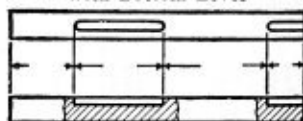
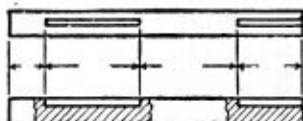
Length Inches	PER 100 POUNDS NET		
	Hexagons	Squares	Flats
3 to 5 1/2	1.00	1.00	2.00
6 " 11 1/2	.50	.50	1.00
12 " 23 1/2	.25	.50	.50
24 " 59 1/2	.10	.25	.25

QUANTITY DIFFERENTIALS

All specifications for less than 1,000 pounds of a size will be subject to the following extras, the total weight of a size ordered to determine the extra, regardless of length and regardless of the exact quantity actually shipped:

500 to 999 pounds.....	\$0.05 per 100 pounds net
100 to 499 pounds.....	.10 " 100 " "
Less than 100 pounds.....	.20 " 100 " "

PRICE LIST FOR KEY-SEATING AND SHOULDERING SHAFTING

 Key-Seated for Couplings, Ends
 Left as Made by Milling Cutter
 
 Middle Key-Seats for Pulleys,
 Ends Left as Made by Milling
 Cutter
 
 Round End Key-Seats, Drilled
 with Bottom Level
 
 Square End Key-Seats, with
 Bottom Level
 

Diameter of Shaft, Inches	Key-Seat Width	Depth, Inches	Key-Seating 1 Foot or Less for Coupling Per End	Key-Seating 1 Foot or Less Length S&L Sizes	Middle Splines 1st Foot or Less	Middle Splines 2nd Foot or More	Extra for Squaring Ends of Key-Seat Per Key-Seat	Shoulders or Journals 1 Foot or Less	Shoulders for Addi- tional Ft. or Frac. of Foot
1 to 1 1/4	1/4	3/8	\$0.35	\$0.20	\$0.75	\$0.20	\$1.00	\$0.75	\$0.50
1 1/4 to 1 1/2	3/8	1/2	.40	.25	.80	.25	1.00	.80	.50
1 1/2 to 1 3/4	1/2	5/8	.45	.30	1.00	.30	1.20	1.00	.75
1 3/4 to 2	5/8	3/4	.50	.35	1.30	.35	1.40	1.30	1.05
2 to 2 1/4	3/4	7/8	.55	.45	1.55	.45	1.60	1.55	1.15
2 1/4 to 2 1/2	7/8	1	1.25	.60	1.80	.60	1.80	1.80	1.30
2 1/2 to 2 3/4	1	1 1/8	1.50	.80	2.05	.80	2.00	2.05	1.55
2 3/4 to 3	1 1/8	1 1/4	1.65	.90	2.25	.90	2.20	2.25	1.75
3 to 3 1/4	1 1/4	1 1/2	2.00	1.20	2.50	1.20	2.40	2.50	1.85

TABLE OF HORSE POWER FOR LINE SHAFTS

Diameter of Shaft, Inches	Revolutions Per Minute							
	100	125	150	175	200	225	250	300
1 1/8	2.4	3.0	3.6	4.2	4.8	5.4	6.0	7.2
1 1/4	4.3	5.4	6.5	7.6	8.6	9.8	10.8	13.0
1 1/2	6.5	8.0	9.7	11.2	13.0	14.6	16.0	19.4
1 3/4	10.0	12.5	15.0	17.5	20.0	22.5	25.0	30.0
2	14.0	17.8	21.0	24.5	28.0	31.5	35.6	42.0
2 1/4	20.0	25.0	30.0	35.0	40.0	45.0	50.0	60.0
2 1/2	26.5	32.5	40.0	44.6	52.0	59.0	65.0	80.0
2 3/4	34.0	42.5	51.0	59.5	68.0	76.5	85.0	102.0
3	54.0	67.5	81.0	94.5	108.0	122.0	135.0	162.0
3 1/4	80.0	100.0	120.0	140.0	160.0	180.0	200.0	240.0
3 1/2	114.0	142.5	171.0	199.5	228.0	256.5	285.0	342.0
3 3/4	156.0	195.0	234.0	273.0	312.0	351.0	390.0	486.0
4	208.0	260.0	312.0	364.0	416.0	468.0	520.0	624.0
4 1/4	270.0	337.5	405.0	472.5	540.0	607.5	675.0	810.0
4 1/2	340.0	425.0	510.0	595.0	680.0	765.0	850.0	1020.0
4 3/4	420.0	525.0	630.0	735.0	840.0	945.0	1050.0	1260.0
5	640.0	800.0	960.0	1120.0	1280.0	1440.0	1600.0	1920.0

The above table is figured on formula

$$\frac{D^3 \times R \times P. M.}{80} = H. P.$$

For headshafts with bearings close to pulley use formula

$$\frac{D^3 \times R \times P. M.}{100} = H. P.$$

For headshafts when bearings are 8 feet centers and pulley in center of bay use shaft one inch larger than would be used if bearings were close to pulley. When figuring use even sizes, namely, 3 inches instead of 2 1/8 inches.

SOLID IRON PULLEYS, SINGLE BELT

BORED, TURNED AND BALANCED WITH
SET SCREWS OR KEY SEATS

Diam., Inches	Width of Face, Inches									
	3	4	5	6	7	8	9	10	11	12
6	\$2.20	\$2.50	\$2.85	\$3.20	\$3.60	\$4.05	.....	.....	.....	.....
7	2.40	2.75	3.10	3.50	3.95	4.40	.....	.....	.....	.....
8	2.65	3.00	3.40	3.80	4.25	4.75	.....	.....	.....	.....
9	2.90	3.25	3.65	4.10	4.60	5.10	.....	.....	.....	.....
10	3.10	3.50	3.95	4.40	4.90	5.45	.....	.....	.....	.....
11	3.30	3.75	4.20	4.70	5.25	5.85	.....	.....	.....	.....
12	3.60	4.05	4.55	5.10	5.70	6.30	.....	.....	.....	.....
13	3.65	4.35	4.90	5.50	6.10	6.75	\$ 7.45	.....	.....	.....
14	4.05	4.65	5.10	5.75	6.45	7.20	7.95	.....	.....	.....
15	4.35	4.85	5.65	6.10	6.85	7.70	8.60	.....	.....	.....
16	4.65	5.20	5.80	6.50	7.30	8.20	9.20	.....	.....	.....
17	4.90	5.50	6.25	7.00	7.85	8.75	9.75	.....	.....	.....
18	5.20	5.85	6.60	7.40	8.30	9.30	10.40	.....	.....	.....
19	5.45	6.25	7.05	7.90	8.85	9.85	10.95	.....	.....	.....
20	5.75	6.65	7.55	8.50	9.45	10.45	11.55	\$12.70	.....	.....
21	6.05	7.00	8.00	9.00	10.00	11.00	12.10	13.25	.....	.....
22	6.35	7.40	8.45	9.50	10.55	11.55	12.65	13.85	.....	.....
23	6.70	7.80	8.90	10.00	11.10	12.15	13.30	14.45	.....	.....
24	7.05	8.20	9.35	10.50	11.65	12.80	14.00	15.20	.....	.....
25	7.40	8.60	9.80	11.00	12.20	13.40	14.65	15.90	.....	.....
26	7.75	9.00	10.25	11.50	12.75	14.05	15.35	16.70	.....	.....
27	8.15	9.50	10.80	12.10	13.45	14.80	16.20	17.65	\$19.15	.....
28	8.55	9.95	11.35	12.75	14.15	15.55	17.00	18.50	20.10	.....
29	9.00	10.50	12.00	13.45	14.90	16.35	17.95	19.45	21.05	.....
30	9.40	10.90	12.45	14.00	15.85	17.15	18.75	20.35	22.00	.....
31	9.85	11.40	12.95	14.55	16.15	17.80	19.50	21.25	23.00	.....
32	10.30	11.90	13.55	15.20	16.90	18.60	20.35	22.15	24.00	.....
33	10.80	12.40	14.10	15.85	17.65	19.45	21.30	23.15	25.05	.....
34	11.35	12.95	14.70	16.50	18.40	20.30	22.20	24.15	26.10	.....
35	11.85	13.50	15.30	17.15	19.10	21.20	23.10	25.15	27.20	.....
36	12.40	14.20	16.05	18.00	20.05	22.10	24.15	26.20	28.30	\$30.45
38	.....	15.65	17.70	19.80	21.95	24.10	26.25	28.40	30.60	32.85
40	.....	16.75	18.95	21.15	23.40	25.70	28.00	30.30	32.60	34.95
42	.....	17.90	20.20	22.60	25.00	27.40	29.80	32.20	34.65	37.10
44	.....	19.30	21.75	24.20	26.70	29.25	31.80	34.30	36.80	39.30
46	.....	20.80	23.35	25.95	28.55	31.20	33.85	36.50	39.15	41.60
48	.....	22.40	25.05	27.75	30.45	33.20	35.95	38.75	41.60	43.90

SOLID IRON PULLEYS, DOUBLE BELT
BORED, TURNED AND BALANCED, WITH SET SCREWS OR
KEY SEATS

Diam., Inches	Width of Face, Inches									
	3	4	5	6	7	8	9	10	11	12
6	\$2.50	\$2.80	\$3.15	\$3.60	\$4.10	\$4.55	\$5.05	\$5.55	\$6.05	\$6.55
7	2.70	3.05	3.50	3.95	4.40	4.90	5.35	5.85	6.35	6.85
8	2.90	3.35	3.80	4.25	4.75	5.25	5.80	6.35	6.95	7.60
9	3.20	3.65	4.15	4.65	5.20	5.75	6.30	6.90	7.50	8.15
10	3.45	3.95	4.45	5.00	5.55	6.15	6.80	7.50	8.20	8.95
11	3.70	4.25	4.80	5.40	6.00	6.65	7.30	8.00	8.75	9.55
12	3.95	4.55	5.15	5.80	6.45	7.15	7.85	8.60	9.35	10.15
13	4.20	4.85	5.50	6.20	6.90	7.65	8.40	9.20	10.00	10.85
14	4.50	5.20	5.95	6.70	7.50	8.30	9.10	9.95	10.80	11.70
15	4.80	5.55	6.35	7.15	8.00	8.85	9.75	10.65	11.60	12.55
16	5.10	5.80	6.60	7.45	8.50	9.20	10.10	11.05	12.00	13.00
17	5.40	6.25	7.10	8.00	8.90	9.85	10.80	11.80	12.80	13.85
18	5.70	6.65	7.60	8.55	9.55	10.55	11.60	12.65	13.75	14.85
19	6.05	7.05	8.10	9.15	10.25	11.35	12.40	13.55	14.70	15.90
20	6.40	7.45	8.55	9.65	10.80	11.95	13.15	14.35	15.60	16.85
21	6.75	7.85	9.00	10.15	11.35	12.55	13.80	15.05	16.35	17.65
22	7.10	8.30	9.50	10.75	12.00	13.30	14.60	15.95	17.30	18.70
23	7.50	8.75	10.05	11.35	12.70	14.05	15.45	16.85	18.30	19.75
24	7.90	9.25	10.60	12.00	13.40	14.85	16.30	17.80	19.30	20.85
25	8.35	9.75	11.20	12.65	14.15	15.65	17.20	18.75	20.35	21.95
26	8.80	10.30	11.80	13.35	14.90	16.50	18.10	19.75	21.40	23.10
27	9.30	10.85	12.45	14.05	15.70	17.35	19.05	20.75	22.50	24.25
28	9.80	11.45	13.15	14.80	16.50	18.25	20.00	21.80	23.60	25.45
29	10.30	12.00	13.75	15.50	17.30	19.10	20.95	22.80	24.70	26.60
30	10.85	12.65	14.45	16.30	18.15	20.05	21.95	23.90	25.85	27.85
31	11.40	13.25	15.15	17.05	19.00	20.95	22.95	24.95	27.00	29.05
32	11.95	13.90	15.95	17.85	19.85	21.90	23.95	26.05	28.15	30.30
33	12.50	14.50	16.55	18.60	20.70	22.80	24.95	27.10	29.30	31.55
34	13.10	15.20	17.30	19.45	21.60	23.80	26.05	28.30	30.60	32.90
35	13.70	15.90	18.10	20.35	22.60	24.90	27.20	29.55	31.90	34.30
36	14.30	16.55	18.85	21.15	23.50	25.85	28.25	30.70	33.15	35.65
38	.....	18.00	20.50	23.00	25.55	28.10	30.70	33.30	35.95	38.60
40	.....	19.50	22.15	24.80	27.45	30.10	32.80	35.50	38.20	40.95
42	.....	21.05	23.85	26.65	29.45	32.25	35.10	37.95	40.80	43.70
44	.....	22.65	25.65	28.65	31.65	34.65	37.70	40.75	43.80	46.85
46	.....	24.35	27.50	30.65	33.85	37.05	40.25	43.45	46.70	49.95
48	.....	26.10	29.40	32.75	36.10	39.45	42.85	46.25	49.65	53.10
50	.....	27.90	31.40	34.90	38.40	41.95	45.50	49.10	52.70	56.35
52	.....	29.80	33.50	37.25	41.00	44.75	48.55	52.35	56.20	60.05
54	.....	31.75	35.65	39.60	43.55	47.55	51.55	55.60	59.65	63.75
56	.....	33.80	37.90	42.05	46.20	50.40	54.65	58.95	63.25	67.50
58	.....	35.95	40.25	44.60	49.00	53.45	57.95	62.45	67.00	71.55
60	.....	38.20	42.65	47.25	51.85	56.50	61.20	65.90	70.65	75.45
62	.....	40.50	45.15	49.85	54.60	59.40	64.25	69.15	74.10	79.10
64	.....	.....	.....	52.65	57.50	62.40	67.35	72.35	77.40	82.50
66	.....	.....	.....	55.55	60.50	65.50	70.55	75.65	80.80	86.00
68	.....	.....	.....	58.55	63.60	68.70	73.85	79.05	84.30	89.60
70	.....	.....	.....	61.50	66.70	71.95	77.85	82.65	88.10	93.60
72	.....	.....	.....	64.55	69.90	75.30	80.75	86.25	91.80	97.40
74	.....	.....	.....	.....	.....	78.75	84.35	90.05	95.80	101.60
76	.....	.....	.....	.....	.....	82.30	88.05	93.90	99.85	105.90
78	.....	.....	.....	.....	.....	85.95	91.90	97.95	104.10	110.40
84	.....	.....	.....	.....	.....	97.50	104.20	111.00	117.90	124.95

SOLID IRON PULLEYS, DOUBLE BELT BORED, TURNED AND BALANCED, WITH SET SCREWS OR KEY SEATS

Diam., Inches	Width of Face, Inches									
	13	14	15	16	17	18	19	20	22	24
8	\$8.30	.....	.....	.....	.....	.....	.....	.....	.....	.....
9	8.85	.....	.....	.....	.....	.....	.....	.....	.....	.....
10	9.70	.....	.....	.....	.....	.....	.....	.....	.....	.....
11	10.40	.....	.....	.....	.....	.....	.....	.....	.....	.....
12	10.95	\$11.75	\$12.60	.....	.....	.....	.....	.....	.....	.....
13	11.70	12.60	13.50	.....	.....	.....	.....	.....	.....	.....
14	12.60	13.50	14.45	.....	.....	.....	.....	.....	.....	.....
15	13.50	14.50	15.50	.....	.....	.....	.....	.....	.....	.....
16	14.00	15.00	16.95	\$17.20	\$18.20	.....	.....	.....	.....	.....
17	14.90	16.00	17.10	18.25	19.40	.....	.....	.....	.....	.....
18	15.90	17.05	18.25	19.45	20.70	.....	.....	.....	.....	.....
19	17.10	18.35	19.60	20.90	22.20	\$23.55	\$24.90	.....	.....	.....
20	18.15	19.45	20.80	22.15	23.55	24.95	26.40	.....	.....	.....
21	19.00	20.35	21.75	23.15	24.60	26.05	27.55	.....	.....	.....
22	20.10	21.55	23.00	24.50	26.00	27.55	29.10	\$30.70	.....	.....
23	21.25	22.75	24.30	25.85	27.45	29.05	30.70	32.35	.....	.....
24	22.40	24.00	25.60	27.25	28.90	30.60	32.30	34.05	.....	.....
25	23.60	25.25	26.95	28.65	30.40	32.15	33.95	35.75	\$39.45	.....
26	24.80	26.55	28.30	30.10	31.90	33.75	35.60	37.50	41.35	.....
27	26.05	27.85	29.70	31.55	33.45	35.35	37.30	39.25	43.25	.....
28	27.80	29.20	31.10	33.05	34.90	36.90	38.90	40.95	45.10	.....
29	28.55	30.50	32.50	34.50	36.55	38.60	40.70	42.80	47.10	.....
30	29.85	31.90	33.95	36.00	38.10	40.25	42.40	44.60	49.05	.....
31	31.15	33.25	35.40	37.55	39.75	41.95	44.20	46.45	51.10	.....
32	32.50	34.70	36.95	39.20	41.50	43.80	46.15	48.50	53.30	.....
33	33.80	36.10	38.40	40.75	43.10	45.50	47.90	50.35	55.30	\$60.35
34	35.25	37.60	40.00	42.40	44.85	47.30	49.80	52.30	57.40	62.65
35	36.70	39.15	41.60	44.10	46.60	49.15	51.70	54.30	59.60	65.00
36	38.15	40.70	43.25	45.85	48.45	51.10	53.75	56.45	61.90	67.40
38	41.30	44.00	46.75	49.50	52.30	55.10	57.95	60.80	66.55	72.35
40	43.70	46.45	49.25	52.05	54.90	57.75	60.60	63.60	69.35	75.35
42	46.60	49.50	52.45	55.40	58.35	61.35	64.35	67.35	73.35	79.40
44	49.95	53.05	56.15	59.25	62.40	65.55	68.70	71.80	78.25	84.75
46	53.20	56.50	59.80	63.10	66.45	69.80	73.15	76.55	83.40	90.30
48	56.55	60.00	63.50	67.00	70.55	74.10	77.70	81.30	88.60	95.95
50	60.00	63.70	67.40	71.15	74.90	78.70	82.50	86.35	94.15	102.05
52	63.95	67.85	71.80	75.75	79.75	83.75	87.80	91.85	100.00	108.20
54	67.85	72.00	76.15	80.35	84.55	88.80	93.05	97.35	106.00	114.70
56	71.85	76.25	80.65	85.10	89.55	94.05	98.55	103.10	112.25	121.45
58	76.15	80.75	85.40	90.05	94.75	99.45	104.20	108.95	118.60	128.45
60	80.30	85.15	90.05	95.00	100.00	105.05	110.10	115.20	125.55	136.00
62	84.15	89.25	94.40	99.60	104.85	110.15	115.50	120.90	131.85	142.95
64	87.65	92.85	98.10	103.40	108.75	114.15	119.60	125.10	136.30	147.90
66	91.25	96.55	101.90	107.30	112.75	118.25	123.80	129.45	141.05	152.95
68	94.95	100.35	105.80	111.30	116.85	122.50	128.20	133.95	145.75	157.95
70	99.15	104.75	110.40	116.10	121.90	127.75	133.70	139.75	152.15	164.90
72	103.10	108.85	114.70	120.65	126.70	132.85	139.10	145.45	158.45	171.95
74	107.50	113.50	119.60	125.80	132.10	138.50	145.00	151.60	165.20	179.20
76	112.05	118.30	124.65	131.10	137.65	144.30	151.10	158.00	172.10	186.60
78	116.80	123.30	129.90	136.60	143.45	150.40	157.45	164.60	179.20	194.20
84	132.10	139.40	146.80	154.35	162.00	169.80	177.70	185.75	202.20	219.00
90	149.05	157.20	165.50	173.90	182.40	191.05	199.80	208.70	227.00	245.70
96	167.70	176.80	186.00	195.30	204.70	214.20	223.80	233.50	253.20	273.30
102	183.20	193.05	202.95	212.90	222.95	233.05	243.20	253.40	273.95	294.76
108	199.05	209.55	220.15	230.80	241.55	252.35	263.25	274.70	296.40	318.80
120	238.50	250.45	262.50	274.65	286.90	299.25	311.70	324.25	349.65	375.50

SPLIT IRON PULLEYS, SINGLE BELT

BORED, TURNED AND BALANCED WITH SET SCREWS AND

KEY SEATS

Diameter, Inches	Width of Face, Inches									
	3	4	5	6	7	8	9	10	11	12
6	\$3.70	\$4.00	\$4.60	\$4.95	\$5.60	\$6.05	.....	.....	.....	.....
7	3.90	4.25	4.85	5.25	5.95	6.40	.....	.....	.....	.....
8	4.25	4.60	5.30	5.70	6.45	6.95	.....	.....	.....	.....
9	4.50	4.85	5.55	6.00	6.80	7.30	.....	.....	.....	.....
10	4.80	5.20	6.00	6.45	7.30	7.85	.....	.....	.....	.....
11	5.00	5.45	6.25	6.75	7.65	8.25	.....	.....	.....	.....
12	5.40	5.85	6.75	7.30	8.30	8.90	.....	.....	.....	.....
13	5.45	6.15	7.10	7.70	8.70	9.35	\$10.50	.....	.....	.....
14	6.00	6.60	7.50	8.15	9.30	9.95	11.30	.....	.....	.....
15	6.30	6.80	8.05	8.50	9.70	10.55	11.95	.....	.....	.....
16	6.75	7.30	8.40	9.10	10.40	11.30	12.85	.....	.....	.....
17	7.00	7.60	8.85	9.60	10.95	11.95	13.40	.....	.....	.....
18	7.45	8.05	9.40	10.20	11.70	12.65	14.35	.....	.....	.....
19	7.70	8.50	9.85	10.70	12.20	13.20	14.90	.....	.....	.....
20	8.20	9.10	10.60	11.55	13.10	14.10	15.85	\$17.00	.....	.....
21	8.50	9.45	11.05	12.05	13.65	14.65	16.40	17.55	.....	.....
22	9.00	10.05	11.75	12.80	14.50	15.50	17.30	18.50	.....	.....
23	9.35	10.45	12.20	13.30	15.05	16.10	17.95	19.10	.....	.....
24	9.85	11.00	12.90	14.05	15.90	17.05	19.00	20.20	.....	.....
25	10.20	11.40	13.35	14.55	16.45	17.65	19.65	20.90	.....	.....
26	10.75	12.00	14.10	15.35	17.35	18.65	20.75	22.10	.....	.....
27	11.15	12.50	14.65	15.95	18.05	19.40	21.60	23.05	\$25.35	.....
28	11.80	13.20	15.50	16.90	19.10	20.50	22.80	24.30	26.75	.....
29	12.25	13.75	16.15	17.60	19.85	21.30	24.75	25.25	27.70	.....
30	12.90	14.40	16.90	18.45	21.15	22.45	24.95	26.55	29.10	.....
31	13.35	14.90	17.40	19.00	21.45	23.10	25.70	27.45	30.10	.....
32	14.10	15.70	18.35	20.00	22.60	24.30	27.00	28.80	31.60	.....
33	14.60	16.20	18.90	20.65	23.25	26.10	27.95	29.80	32.65	.....
34	15.45	17.05	19.85	21.65	24.50	26.40	29.30	31.25	34.20	.....
35	15.95	17.60	20.45	22.30	25.20	27.30	30.20	32.25	35.30	.....
36	16.80	18.60	21.55	23.50	26.55	28.60	31.70	33.75	36.90	\$39.05
38	.....	20.40	23.65	25.70	28.90	31.05	34.30	36.45	39.75	42.00
40	.....	21.85	25.25	27.45	30.80	33.10	36.55	38.85	42.30	44.65
42	.....	23.35	26.90	29.30	32.85	35.25	38.85	41.25	44.90	47.35
44	.....	25.15	28.90	31.35	35.05	37.60	41.40	43.90	47.65	50.15
46	.....	27.05	30.95	33.55	37.40	40.05	44.00	46.65	50.60	53.05
48	.....	29.05	33.10	35.80	39.80	42.55	46.65	49.45	53.65	55.95

Prices on larger diameters will be furnished upon receipt of inquiry.

No pulleys will be made single belt with bores larger than standard limits.

For tight and loose pulleys see additional list.

For flange pulleys see additional list.

Additional charge is made if bore is larger than standard.

For list of clamp hub pulleys (split hub, solid rim), add one-half the difference between the lists of solid and split pulleys to that of the solid pulleys.

SPLIT IRON PULLEYS, DOUBLE BELT **BORED, TURNED AND BALANCED WITH SET SCREWS OR KEY SEATS**

Diam. Inches	Width of Face, Inches									
	3	4	5	6	7	8	9	10	12	14
6	\$4.00	\$ 4.30	\$ 4.90	\$ 5.35	\$ 6.10	\$ 6.55	\$ 7.35	\$ 7.85	\$ 9.15	.....
7	4.20	4.55	5.25	5.70	6.40	6.90	7.65	8.15	9.50	.....
8	4.50	4.95	5.70	6.15	6.95	7.45	8.35	8.90	10.50	.....
9	4.80	5.25	6.05	6.55	7.40	7.95	8.85	9.45	11.05	.....
10	5.15	5.65	6.50	7.05	7.95	8.55	9.60	10.30	12.15	.....
11	5.40	5.95	6.85	7.65	8.40	9.05	10.10	10.80	12.75	.....
12	5.75	6.40	7.35	8.00	9.05	9.75	10.90	11.65	13.65	\$15.75
13	6.00	6.65	7.70	8.40	9.50	10.25	11.45	12.25	14.35	16.60
14	6.45	7.15	8.35	9.10	10.35	11.15	12.45	13.30	15.55	17.90
15	6.75	7.50	8.75	9.55	10.85	11.70	13.10	14.00	16.40	18.90
16	7.20	7.90	9.20	10.05	11.60	12.30	13.75	14.70	17.20	19.80
17	7.50	8.35	9.70	10.60	12.00	12.95	14.45	15.50	18.05	20.80
18	7.95	8.90	10.40	11.35	12.90	13.90	15.55	16.60	19.40	22.25
19	8.30	9.30	10.95	11.95	13.60	14.70	16.35	17.50	20.45	23.55
20	8.85	9.90	11.60	12.70	14.45	15.60	17.45	18.65	21.80	25.10
22	9.75	10.95	12.80	14.05	15.95	17.25	19.25	20.60	24.05	27.65
24	10.70	12.05	14.15	15.55	17.65	19.10	21.30	22.80	26.60	30.55
25	11.15	12.55	14.75	16.20	18.40	19.90	22.20	23.75	27.70	31.80
26	11.80	13.30	15.65	17.20	19.50	21.10	23.50	25.15	29.30	33.60
27	12.30	13.85	16.30	17.90	20.30	21.95	24.45	26.15	30.45	34.90
28	13.05	14.65	17.25	18.95	21.45	23.20	25.80	27.60	32.10	36.75
29	13.55	15.25	17.90	19.65	22.25	24.05	26.75	28.60	33.25	38.05
30	14.35	16.15	18.90	20.75	23.45	25.35	28.15	30.10	34.95	39.95
31	14.90	16.75	19.60	21.50	24.30	26.25	29.15	31.15	36.15	41.30
32	15.75	17.70	20.65	22.65	25.55	27.60	30.60	32.70	37.90	43.30
33	16.30	18.30	21.35	23.40	26.30	29.45	31.60	33.75	39.20	44.70
34	17.20	19.30	22.45	24.60	27.70	29.90	33.15	35.40	41.00	46.75
35	17.80	20.00	23.25	25.50	28.70	31.00	34.30	36.65	42.40	48.30
36	18.70	20.95	24.40	26.65	30.00	32.35	35.80	38.25	44.25	50.40
38	.....	22.75	26.45	28.90	32.50	35.05	38.75	41.35	47.75	54.30
40	.....	24.60	28.45	31.10	34.85	37.50	41.35	44.05	50.65	57.35
42	.....	26.50	30.55	33.35	37.30	40.10	44.15	47.00	53.95	60.70
44	.....	28.50	32.80	35.80	40.00	43.00	47.30	50.30	57.70	64.90
46	.....	30.60	35.10	38.25	42.70	45.90	50.40	53.60	61.40	69.00
48	.....	32.75	37.45	40.80	45.45	48.80	53.55	57.95	65.15	73.15
50	.....	35.00	39.95	43.45	48.30	51.85	56.80	60.40	69.05	77.55
52	.....	37.35	42.55	46.30	51.45	55.20	60.45	64.25	73.40	82.40
54	.....	39.75	45.20	49.15	54.55	58.55	64.05	68.10	77.75	87.25
56	.....	42.30	48.00	52.15	57.80	62.00	67.80	72.10	82.20	92.25
58	.....	44.95	50.90	55.25	61.20	65.65	71.75	76.25	86.95	97.50
60	.....	47.70	53.85	58.45	64.65	69.30	75.65	80.35	91.55	102.65
62	.....	50.55	56.95	61.65	68.05	72.85	79.40	84.30	95.95	107.55
64	.....	.....	.....	65.05	71.60	76.50	83.20	88.20	100.10	111.95
66	.....	.....	.....	68.55	75.25	80.25	87.10	92.20	104.35	116.45
68	.....	.....	.....	72.20	79.05	84.15	91.15	96.35	108.75	121.10
70	.....	.....	.....	75.80	82.85	88.10	95.30	100.70	113.55	126.35
72	.....	.....	.....	79.50	86.75	92.15	99.55	105.05	118.15	131.30
74	.....	.....	.....	.....	.....	96.35	103.95	109.65	123.20	136.85
76	.....	.....	.....	.....	.....	100.65	108.45	114.30	128.35	142.55
78	.....	.....	.....	.....	.....	105.05	113.10	119.15	133.70	148.45
84	.....	.....	.....	.....	.....	119.00	127.95	134.75	150.95	167.40
90	.....	.....	.....	.....	.....	134.00	144.00	151.70	169.85	188.20
96	.....	.....	.....	.....	.....	150.05	161.35	170.15	190.55	210.95
102	.....	.....	.....	.....	.....	164.55	176.80	186.40	208.45	230.50
108	.....	.....	.....	.....	.....	180.20	193.20	203.40	226.90	250.45
120	.....	.....	.....	.....	.....	218.85	233.60	245.25	271.95	298.70

LIST OF MAXIMUM BORES
FURNISHED IN PULLEYS AT REGULAR PRICES

Diameters of Pulleys, in Inches	Diameters of Bores, in Inches	Diameters of Pulleys, in Inches	Diameters of Bores, in Inches
6-9	1 $\frac{1}{16}$	31-42	3 $\frac{1}{16}$
10-15	2 $\frac{1}{16}$	43-48	4 $\frac{1}{16}$
16-20	2 $\frac{3}{16}$	50-60	4 $\frac{3}{16}$
21-30	3 $\frac{1}{16}$	62-120	5 $\frac{1}{16}$

Standard hub length is not greater than twice the bore.

**ADDITIONAL PRICES FOR BORES LARGER
 THAN MAXIMUM**

AS SPECIFIED IN LIST ABOVE

Diam. 6 to 15 in., add 10 per cent for each additional $\frac{1}{16}$ in. or fractional part thereof
 " 16 " 30 " " 10 " " " " " $\frac{1}{8}$ " " " " " "
 " 31 " 60 " " 5 " " " " " $\frac{1}{2}$ " " " " " "

FOR MAKING PULLEYS TIGHT AND LOOSE
 ADD TO LIST PRICES PER PAIR AS FOLLOWS

Diameter, Inches	Face, Inches						
	3 and 4	5 and 6	7 and 8	9 and 10	11 and 12	13 and 14	15 and 16
6 to 9	\$1.30	\$2.00	\$3.00	\$4.50	.....	.....	.....
10 " 15	1.50	2.30	3.40	5.00	\$7.00	.....	.....
16 " 20	2.10	2.90	4.00	5.50	7.50	.....	.....
21 " 30	3.30	4.10	5.20	6.80	9.10	\$12.50	.....
31 " 42	4.50	5.50	6.90	9.00	12.10	16.50	\$23.00
43 " 60	6.00	7.40	9.30	12.00	15.80	21.00	29.00

FOR MAKING PULLEYS DOUBLE FLANGED
 ADD TO LIST PRICE OF PULLEY AS FOLLOWS

Diameter, Inches	Price	Diameter, Inches	Price	Diameter, Inches	Price
6 and 7	\$2.40	34 and 35	\$20.05	76 and 78	\$73.75
8 " 9	3.10	36 " 37	21.95	80 " 82	79.30
10 " 11	3.90	38 " 39	24.10	84 " 86	84.75
12 " 13	4.70	40 " 41	26.35	88 " 90	90.10
14 " 15	5.65	42 " 43	28.75	92 " 94	95.40
16 " 17	6.60	44 " 45	31.30	96 " 98	100.85
18 " 19	7.60	46 " 47	33.85	100 " 102	106.00
20 " 21	8.80	48 " 50	37.60	104 " 106	111.80
22 " 23	10.15	52 " 54	42.25	108 " 110	117.15
24 " 25	11.50	56 " 58	47.20	112 " 114	122.35
26 " 27	13.05	60 " 62	52.25	116 " 118	127.35
28 " 29	14.70	64 " 66	57.50	120	132.05
30 " 31	16.40	68 " 70	62.85	.....	.....
32 " 33	18.20	72 " 74	68.30	.....	.....

Pulleys with one flange only, one-half that given above.

Pulleys with three flanges, one-half more than given above.

DODGE "STANDARD" SPLIT IRON PULLEY

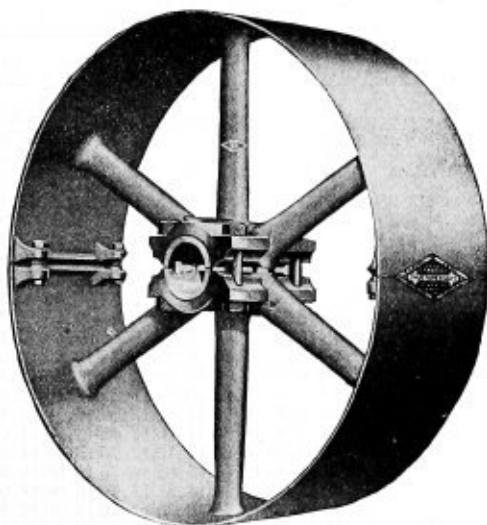


FIG. 1792

Certain prejudices exist in the general trade with regard to pulleys. Some customers prefer the wood split pulley and will make use of no other kind in their factory. On the other hand, other customers favor a metallic pulley, and there are of course some places where a metallic pulley is absolutely essential.

The Dodge "Standard" Split Iron Pulley is designed to meet this demand for a metallic pulley, which it does in a most successful and satisfactory manner. The advantages of this pulley may be briefly summed up as follows:

(1) Its system of interchangeable metallic bushings makes possible the application of the pulley upon any size of shaft within its range of standard bore.

(2) The pulley being split can be quickly applied to any shaft already in place, or it can be removed with equal facility.

(3) The pulley is carefully balanced and will not wobble or weave upon the shaft.

(4) The superior compression fastening securely holds the pulley upon the shaft without the necessity of keyways or setscrews.

(5) The pulley will last forever, there being no rivets or other parts which finally crystallize and wear off.

(6) The pulley will maintain an absolutely round shape under all conditions of belt strain, a condition necessary for efficiency in operation and which condition is not met by riveted or bolted construction of flexible materials.

(7) The weight of the pulley, which is somewhat heavier than that of any other metallic pulley made for, and carried in stock, is an important advantage in many classes of service, particularly where line shafts are driven by electric motors. The weight of the pulley in such a case gives a fly wheel effect to the shafting equipment, which steadies the load upon the motor, increases its efficiency and reduces the consumption of current.

DODGE "STANDARD" SPLIT IRON PULLEYS

PRICE LIST

DIAMETER INCHES	3	4	5	6	7	8	9	10	12	14
6	\$3.25	\$3.85	\$4.05	\$4.30	\$4.95	\$5.20				
7	3.40	4.00	4.25	4.50	5.15	5.40				
8	3.55	4.20	4.45	4.70	5.35	5.60				
9	3.70	4.35	4.60	4.90	5.60	5.90				
10	3.85	4.50	4.80	5.15	5.85	6.20	\$6.55	\$6.90		
11	4.20	5.15	5.45	5.80	6.80	7.20	7.50	7.90		
12	4.35	5.35	5.70	6.05	7.05	7.40	7.80	8.20	\$10.20	
13		5.55	5.90	6.30	7.30	7.75	8.10	8.55	10.80	
14		5.75	6.10	6.55	7.55	8.05	8.45	8.95	11.25	
15		5.95	6.35	6.80	7.90	8.35	8.80	9.30	11.50	\$13.15
16		6.15	6.60	7.10	8.20	8.70	9.15	9.70	12.00	13.80
17		6.40	6.90	7.40	8.55	9.05	9.60	10.15	12.50	14.40
18		6.65	7.15	7.70	8.90	9.45	10.00	10.60	13.10	15.15
19		7.35	8.65	9.25	10.50	11.10	11.70	12.35	15.35	17.60
20		7.60	8.95	9.60	10.90	11.55	12.20	12.90	16.00	18.00
21		7.90	9.25	9.95	11.30	12.00	12.70	13.45	16.65	18.80
22		8.20	9.55	10.30	11.70	12.45	13.20	14.00	17.30	19.65
23		8.45	9.90	10.65	12.10	12.90	13.70	14.55	18.00	20.45
24		9.70	11.25	12.05	13.85	14.70	15.60	16.50	20.40	22.95
26		10.50	12.05	13.00	14.85	15.95	16.90	18.00	22.25	24.90
28		11.30	12.90	13.90	16.00	17.10	18.30	19.50	24.10	26.80
30		12.15	13.85	14.95	17.15	18.40	19.70	21.15	25.85	28.80
32		13.90	16.05	17.25	19.70	21.15	22.65	24.15	30.35	33.50
34		14.90	17.10	18.50	21.10	22.60	24.30	25.85	32.20	35.70
36		15.90	18.25	19.70	22.45	24.10	25.85	27.60	34.30	37.90
38		19.05	21.45	23.10	27.85	28.95	30.80	32.70	40.15	44.00
40		20.20	22.80	24.60	28.80	30.70	32.65	34.65	42.30	46.40
42		21.40	24.20	26.10	30.45	32.45	34.50	36.60	44.50	48.80
44		22.75	25.70	27.75	32.20	34.35	36.50	38.70	46.90	51.40
46		24.15	27.20	29.35	33.95	36.25	38.50	40.85	49.30	54.10
48		29.00	31.20	33.50	38.85	41.25	43.65	46.15	56.20	61.30
50			32.80	35.30	40.75	43.25	45.80	48.45	58.80	64.20
52			34.50	37.10	42.65	45.30	48.00	50.75	61.40	67.20
54			36.20	38.90	44.65	47.40	50.20	53.05	64.00	70.20

STANDARD BORES FOR
DODGE "STANDARD" SPLIT IRON PULLEYS

6 to 9-inch diameter, inclusive	2 $\frac{7}{8}$ -inch bore
10 to 24-inch diameter, inclusive	2 $\frac{3}{4}$ -inch bore
25 to 36-inch diameter, inclusive	3 $\frac{1}{2}$ -inch bore
37 to 54-inch diameter, inclusive	3 $\frac{3}{4}$ -inch bore

Split Iron Bushings are furnished to bush the Pulleys to proper shaft sizes.

BUSHINGS FOR DODGE "STANDARD" SPLIT IRON PULLEYS



FIG. 1793

These bushings are made and finished whole, then cracked, and the fractured edges are dressed away slightly to provide for proper clamping clearance.

Two complete bushings are required for each pulley, one for each end of pulley hub.

PRICE LIST OF BUSHINGS, PER PAIR

Bushing Bore Inches	Outside Diameter of Bushings, Inches			
	2 ⁷ / ₁₆	2 ¹ / ₂	3 ¹ / ₁₆	3 ¹ / ₂
	Price	Price	Price	Price
1 ¹ / ₁₆	\$0.50	....	....	....
1 ¹ / ₈	.55	\$0.80	....	....
1 ¹ / ₄	.60	.85	....	....
1 ³ / ₈	.65	.90	\$1.30	....
1 ¹ / ₂	.70	1.00	1.35	\$1.80
2 ¹ / ₁₆	.75	1.10	1.45	1.85
2 ¹ / ₈	....	1.20	1.55	1.95
2 ¹ / ₄	....	1.30	1.65	2.05
2 ³ / ₈	....	....	1.75	2.15
3 ¹ / ₁₆	....	....	1.85	2.25
3 ¹ / ₈	....	....	....	2.35
3 ¹ / ₄	....	....	....	2.45

DODGE "STANDARD" SPLIT IRON PULLEYS

MADE TIGHT AND LOOSE

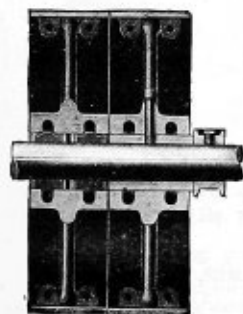


FIG. 1794

By the use of Solid Iron Loose Sleeves, these pulleys can be made in tight and loose form, providing the faces of the pulleys are 4 inches or more from 6 inches to 24 inches diameters, and 5 inches or more 25 inches to 36 inches diameters.

NATIONAL STEEL PULLEYS



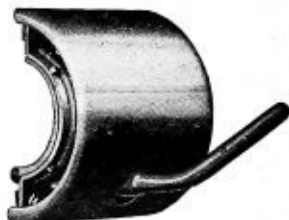
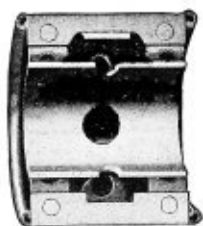
FIG. 1795

The National Steel Split Pulley, made in 3, 4, 5 and 6 inch diameter.

The compression bolts (reached directly and easily through holes in the face) have special, milled, square heads and are readily tightened with malleable socket wrench furnished free with each pulley.

This assures much greater shaft compression than where a screw driver is used.

National Pulleys are suitable for use on small motors, dynamos, wood or metal working machinery, and in fact in all places requiring a strong, well balanced, efficient small pulley.



3 Inches Diameter		4 Inches Diameter		5 Inches Diameter		6 Inches Diameter	
Face Inches	Price	Face Inches	Price	Face Inches	Price	Face Inches	Price
3	\$2.40	3	2.52	3	2.64	3	3.30
4	2.52	4	2.64	4	2.75	4	3.45
5	2.68	5	2.75	5	2.87	5	3.75
6	3.00	6	3.10	6	3.25	6	4.05

STANDARD BORES

Three inch pulleys have hubs 3 inches long and standard bore of $1\frac{1}{4}$ inches. Four and five inch pulleys have standard bore of $1\frac{1}{2}$ inches and hubs 3 inches long. Interchangeable metal bushings are furnished for all shaft sizes in sixteenths.

One bushing and the socket wrench is supplied free with each pulley.

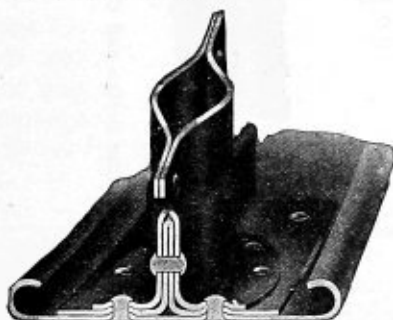
Extra bushings.....each, \$0.30

ONEIDA PRESSED STEEL SPLIT PULLEYS



FIG. 1796

Pulleys 18 inches in diameter and larger can be built with $4\frac{1}{16}$, $6\frac{1}{2}$ or $8\frac{1}{2}$ -inch hub at extra charge.



The fishplate and style of riveting used. Showing the "Oneida" fishplate reinforcement of rim and style of riveting to arms. Note how the parts are made male and female. Impossible to bring to bear a shearing strain on the rivets that could cut them.

6 and 7-inch diameter, $2\frac{3}{16}$ -bore. 8 to 11-inch diameter, inclusive, $3\frac{1}{2}$ -bore.

Under 12 inches in diameter is made with single-arm construction.

These arms are firmly clamped to a set of interchangeable iron bushings.

All pulleys above 48-inch diameter have $4\frac{1}{16}$ -bore. Pulleys 30 inches to 50 inches in diameter have $3\frac{1}{2}$ or $4\frac{1}{16}$ bore without extra cost.

Spiders are added to pulleys according to width of face.

Pulleys 20 inches and larger may have $4\frac{1}{16}$, $6\frac{1}{2}$ or $8\frac{1}{2}$ -bore at extra cost.

MADE WHOLLY FROM PRESSED SHEET STEEL

Is the strongest pulley made of any kind, and yet the lightest metal pulley, weighing about the same as a wood pulley. The steel spokes do not fan the air like a wood pulley. Having a complete system of interchangeable iron bushings, it makes a permanent fastening to the shaft.

ONEIDA PRESSED STEEL PULLEY BUSHINGS



Illustration Showing Design and Comparative Sizes Oneida Bushings

FIG. 1797

ONEIDA PRESSED STEEL PULLEY

SCHEDULE OF SPECIALS AND EXTRAS

LIST PRICES SPECIAL BORES OR HUBS

	Per Hub
Pulleys under 26-inch diameter, fitted with "I" hubs.....	\$ 2.50
Pulleys 26 to 30-inch diameter, having faces 3, 4, 5, 6, and 8 inches wide, fitted with "I" hubs.....	3.00
Pulleys 26 to 30-inch diameter, having faces wider than 8 inches and all diameters over 30 inches, no extra charge for "I" hubs.....	
Pulleys 60-inch diameter and under, fitted with "J" hubs (6½-inch bore)....	5.00
Pulleys 60-inch diameter and under, fitted with "K" hubs.....	7.50
Pulleys any diameter, fitted with "O" 8-arm, high flange malleable hubs (4½-inch bore)	12.00
Pulleys under 96-inch diameter, fitted with "P" 8-arm, high flange malleable hubs (8½-inch bore)	15.00

REVISED PRICE LIST EXTRA BUSHINGS

"F," "G" and "H" Bushings.....	each, \$0.60
"I" Bushings	each, 1.20
"J" Bushings	each, 4.00
"K" Bushings	each, 6.00
"L" and "N" Bushings (for National Pulleys).....	each, .30

KEYSEATING BUSHINGS

1 to 3-inch bore	net each, \$0.30
3½ to 4½-inch bore	net each, .40
Over 4½-inch bore	net each, .50

REVISED EXTRA CHARGES FOR SPECIAL CONSTRUCTION

Double Flange Pulleys add	20% to list price
Odd sizes over 25-inch diameter add.....	25% to list price

ONEIDA SPLIT BUSHINGS FOR TIGHT AND LOOSE PULLEYS

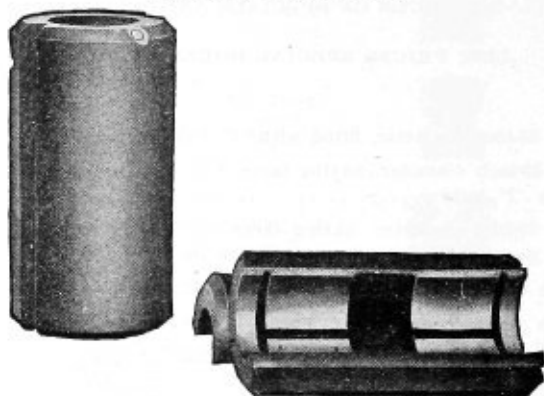


FIG. 1798

Oneida Split Loose Bushings are very easily placed upon the shaft, with a split pulley, without the necessity of taking down the shaft or disturbing any of the other equipment.

They are cast in one piece, bored and turned and then split by fracture. The uneven, ragged edges bring the two halves together to a smooth, accurate fit. They are held in a secure position by the compression of the pulley hub.

A large reservoir in the center holds the lubricating oil. Circular and lengthwise grooves distribute it evenly in the bearing, returning it to the oil chamber when the pulley is not in motion. The oil chamber is filled through a convenient spring oiler.

Split Loose Bushings are made 2 $\frac{1}{16}$, 2 $\frac{1}{8}$, 3 $\frac{1}{2}$, and 4 $\frac{1}{16}$ inch diameter according to shaft size. The price list, subject to liberal discount, gives size of shaft and the length and outside diameter of the bushings.

PRICE LIST OF SPLIT LOOSE BUSHINGS

Effective June 28, 1917

Outside Diameter of Bushings, Inches	Bores of Bushings, Inches	Length of Bushings, Inches.	List Price	Outside Diameter of Bushings, Inches	Bores of Bushings, Inches	Length of Bushings, Inches	List Price
2 ⁷ / ₁₀	1 to 1 ³ / ₄	4 ¹ / ₂	\$3.45	3 ¹ / ₂	1 ³ / ₁₀ to 2 ³ / ₄	4 ¹ / ₂	\$4.30
2 ¹ / ₂	1 to 2 ³ / ₁₀	5 ¹ / ₂	3.85			5 ¹ / ₂	4.95
		4 ¹ / ₂	3.85			6 ¹ / ₂	5.50
		5 ¹ / ₂	4.50			7 ¹ / ₂	6.50
		6 ¹ / ₂	5.00			9 ¹ / ₂	8.30
		7 ¹ / ₂	5.50			10 ¹ / ₂	9.50
		9 ¹ / ₂	6.50			12 ¹ / ₂	10.70
		10 ¹ / ₂	7.00			6 ¹ / ₂	8.00
		12 ¹ / ₂	8.00			7 ¹ / ₂	9.00
Bushings are used 1 ¹ / ₂ inch longer than nominal face width of pulley				4 ⁷ / ₁₀	1 ¹ / ₈ to 3 ⁷ / ₁₀	9 ¹ / ₂	10.90
						10 ¹ / ₂	12.20
						12 ¹ / ₂	14.50

ONEIDA PRESSED STEEL SPLIT PULLEYS

Diameter in Inches	Width of Face									
	2-inch	3-inch	4-inch	5-inch	6-inch	8-inch	10-inch	12-inch	14-inch	16-inch
6	\$3.15	\$3.20	\$3.45	\$3.75	\$4.05	.....	.....	.....	.....	.....
7	3.22	3.28	3.60	3.90	4.20	.....	.....	.....	.....	.....
8	3.30	3.45	3.75	4.05	4.35	\$4.95	\$5.60	.....	.....	.....
9	3.38	3.60	3.90	4.20	4.50	5.10	5.75	.....	.....	.....
10	3.45	3.75	4.05	4.35	4.65	5.25	5.90	\$6.45	.....	.....
11	3.65	3.90	4.20	4.50	4.80	5.40	6.00	6.90	.....	.....
12	3.90	4.20	4.63	4.80	5.33	5.78	6.45	7.65	\$9.00	\$10.25
13	4.05	4.35	4.80	5.20	5.62	6.43	7.20	8.40	9.50	10.75
14	4.20	4.50	5.20	5.65	6.15	7.05	8.03	9.00	10.00	11.25
15	4.35	4.66	5.45	5.80	6.55	7.65	8.80	9.75	10.75	12.00
16	4.50	4.95	5.75	6.10	6.90	8.25	9.45	10.30	11.50	12.65
17		5.25	6.00	6.50	7.28	8.78	10.05	11.25	12.40	13.65
18		5.55	6.38	7.00	7.65	9.30	10.65	12.00	13.25	14.50
19		5.80	6.75	7.50	8.25	10.13	11.25	12.90	14.20	15.60
20		6.00	7.50	8.10	9.00	10.73	12.00	14.25	15.30	16.90
21		6.25	8.00	8.90	9.60	11.25	12.98	15.50	18.00	20.35
22		6.50	8.55	9.50	10.28	12.00	14.10	16.80	19.50	21.30
23		7.00	8.70	9.90	10.58	12.60	14.75	18.00	21.00	24.30
24		7.50	9.20	10.95	10.95	13.30	15.68	19.05	22.65	26.25
25			9.20	10.25	11.45	13.80	16.40	20.20	24.00	29.25
26			9.55	10.50	11.95	14.40	17.10	21.30	26.25	31.20
28			10.80	11.70	12.90	15.45	18.15	22.00	28.50	34.50
30			12.00	12.90	14.10	17.25	19.90	24.75	31.50	38.10
32			13.20	14.10	15.45	19.35	22.50	26.85	34.15	41.45
34			14.40	15.75	17.25	21.75	25.50	30.00	36.75	45.00
36			15.90	17.85	19.60	24.00	28.65	33.75	39.75	48.60
38			19.50	20.65	21.75	26.40	31.05	37.15	42.75	51.75
40			21.00	22.75	24.00	28.50	33.75	40.15	46.50	55.15
42			22.25	24.85	26.25	32.25	37.50	43.50	50.25	57.75
44					29.25	35.62	41.25	47.25	54.00	61.12
46					33.00	39.00	45.00	50.25	57.75	64.50
48					36.15	42.00	48.75	54.00	61.50	67.50
50					40.87	47.25	53.25	58.50	66.00	75.00
52					46.50	51.00	57.00	63.00	69.00	78.75
54					50.25	56.25	61.50	67.50	74.25	83.25
56					64.00	60.75	66.75	72.75	80.25	90.00
58					60.00	65.25	71.25	78.37	86.62	96.37
60					63.75	70.50	77.25	84.00	92.00	102.75
62						72.85	84.30	95.95	107.55	119.35
64						76.50	88.20	100.10	111.95	124.60
66						80.25	92.20	104.35	116.45	129.35
68						84.15	96.35	108.75	121.10	134.25
70						88.10	100.70	113.55	126.35	139.95
72						92.15	105.05	118.15	131.30	145.40
74						96.35	109.65	123.20	136.85	151.30
76						100.65	114.30	128.35	142.55	157.75
78						105.05	119.15	133.70	148.45	164.20
80						109.60	124.25	139.25	154.65	170.95
82						114.25	129.45	145.10	160.95	177.90
84						119.00	134.75	150.95	167.40	184.95
86						123.90	140.25	157.10	174.20	192.40
88						128.90	145.85	163.25	181.05	199.90
90							151.70	169.85	188.20	207.65
92							157.75	176.35	195.70	215.85
94							163.85	183.45	203.20	223.95
96							170.15	190.55	210.95	232.35
98							176.60	197.85	219.10	241.20
100							183.50	203.20	224.90	247.45
102							188.40	208.45	230.50	253.40
104							191.35	213.85	236.30	259.55
106							196.95	220.60	243.05	266.95
108							203.40	226.90	250.45	274.90
110							210.00	234.00	258.05	283.05
112							216.85	241.45	266.15	291.75
114								248.90	274.15	300.30
116								256.50	282.30	309.00
118								264.20	290.50	317.65
120								271.95	298.70	326.40

ONEIDA PRESSED STEEL SPLIT PULLEYS

Diameter in Inches	Width of Face									
	18-inch	20-inch	22-inch	24-inch	26-inch	28-inch	30-inch	32-inch	34-inch	36-inch
24	\$29.92	\$31.50	.....	.....	.....	.....	.....	.....	.....	.....
25	35.05	39.50	.....	.....	.....	.....	.....	.....	.....	.....
26	36.15	41.40	.....	.....	.....	.....	.....	.....	.....	.....
28	40.35	46.35	.....	.....	.....	.....	.....	.....	.....	.....
30	45.00	49.50	\$55.50	\$61.50	\$67.50	\$74.25	\$81.67	.....	.....	.....
32	48.37	54.37	60.37	66.37	72.37	79.60	87.56	\$96.31	.....	.....
34	51.75	57.45	63.75	69.75	75.00	82.50	90.75	99.82	.....	.....
36	55.50	61.50	67.50	73.50	79.50	87.45	96.19	105.80	\$116.38	\$128.01
38	58.87	64.87	70.87	76.87	82.87	91.15	100.26	110.28	121.30	133.42
40	62.25	69.75	77.25	84.75	92.55	101.80	111.98	123.17	135.48	149.02
42	65.62	73.12	80.62	88.12	95.62	105.18	115.69	127.25	139.97	153.96
44	69.00	78.00	87.00	96.00	105.00	115.50	127.05	139.75	153.72	169.09
46	72.00	81.00	90.00	99.00	108.00	118.80	130.68	143.74	158.11	173.92
48	75.00	87.00	99.00	111.00	123.00	135.30	148.82	163.71	180.68	198.05
50	84.00	96.00	108.00	120.00	132.00	145.20	159.72	175.69	193.25	212.57
52	90.00	102.00	114.00	126.00	138.00	151.80	166.98	183.67	202.03	222.23
54	96.75	108.75	120.75	132.75	144.75	159.22	175.14	192.65	211.91	233.10
56	104.25	119.25	134.25	149.25	164.25	180.67	198.73	218.00	240.46	264.50
58	110.62	125.62	140.62	155.62	170.62	187.68	206.44	227.68	249.78	274.75
60	117.00	132.00	147.00	162.00	177.00	194.70	214.17	235.58	259.13	285.04
62	122.30	144.85	165.80	186.65	207.50	227.80	241.10	264.50	288.65	311.70
64	127.20	150.00	171.10	192.20	213.30	233.50	250.40	264.65	293.85	317.75
66	142.20	165.30	186.45	207.60	228.75	248.85	269.95	293.85	318.95	342.20
68	147.40	169.80	191.30	212.80	234.30	254.70	276.85	294.10	319.50	343.65
70	153.60	176.60	198.10	219.60	241.10	261.50	283.20	302.65	324.65	348.60
72	159.65	184.30	206.80	228.30	249.80	270.20	292.90	313.20	335.90	359.30
74	166.30	191.50	214.00	235.50	257.00	278.30	301.95	319.80	340.65	363.70
76	173.10	198.95	221.90	243.85	264.20	285.50	308.10	328.85	349.65	369.70
78	180.20	206.60	229.45	251.40	271.75	293.00	314.35	334.25	355.40	381.45
80	187.45	214.40	237.80	259.65	279.90	300.20	321.65	342.65	363.35	386.60
82	195.05	222.65	246.00	267.60	287.85	308.30	329.55	350.55	371.55	398.55
84	202.75	231.05	254.40	275.40	295.65	316.30	337.35	359.35	380.35	401.70
86	210.55	239.80	263.65	284.65	304.90	325.55	346.55	368.55	390.55	415.60
88	218.55	248.85	272.85	293.85	313.90	334.55	355.55	377.55	399.55	429.55
90	227.30	257.45	281.65	302.65	322.65	343.35	364.35	386.35	408.35	444.55
92	236.10	266.85	290.85	311.85	331.65	352.35	373.35	395.35	417.35	459.55
94	244.95	276.35	300.35	320.85	340.65	361.35	382.35	404.35	426.35	474.55
96	253.90	285.85	309.85	329.85	349.65	370.65	391.65	413.65	435.65	489.55
98	263.25	295.65	319.65	339.65	359.65	380.65	401.65	424.65	446.65	504.55
100	269.90	292.65	316.65	341.65	361.65	382.65	403.65	427.65	449.65	510.55
102	276.35	299.50	323.50	348.50	368.50	389.50	410.50	434.50	456.50	516.50
104	282.75	306.20	329.95	355.25	375.25	396.25	417.25	441.25	463.25	522.50
106	290.90	315.10	338.50	364.00	384.00	405.00	426.00	450.00	472.00	528.50
108	299.40	324.70	347.90	373.40	393.40	414.40	435.40	459.40	481.40	534.50
110	308.15	333.53	356.95	382.85	402.85	423.85	444.85	468.85	490.85	540.50
112	317.35	343.30	366.60	392.60	412.60	433.60	454.60	478.60	500.60	546.50
114	326.45	352.95	375.30	399.65	419.65	440.65	461.65	485.65	507.65	552.50
116	335.80	362.90	384.30	409.30	429.30	450.30	471.30	495.30	517.30	558.50
118	344.95	372.65	393.70	418.15	438.15	459.15	480.15	504.15	526.15	564.50
120	354.25	382.50	411.20	427.00	447.00	468.00	489.00	513.00	535.00	573.50

LIMESTONE WOOD PULLEYS

The Limestone Pulley is constructed of the best materials obtainable.

The manufacturers carry an immense stock of carefully selected lumber and all of it is thoroughly air-dried for many months and then carefully kiln-dried.

The rims are built of sections nailed and glued.

It is worthy of mention that the glue used is of superior quality and is prepared for use in the most careful manner, for unquestionably the gluing of a wood pulley is one of the most important details in its manufacture.

The arms are built of white oak, sections placed edgewise to the strain, and these sections increase with the width of face so that the width of spoke is always in proportion to the width of face.

This method of spoke construction gives the Limestone Pulley ample rim support as well as ample compression on the shaft. The spokes are built into the rim and there firmly secured in such a manner that the strain of compression is equalized upon the extended portion of the rim.

In clamping the pulley upon the shaft heavy plates are used, together with hexagon nuts of large size and in great number. This insures the user against possible slipping on the shaft, no matter how severe the work the pulley may be called on to perform. The Limestone Pulley is finished throughout with orange shellac, unquestionably the best material for the purpose.



FIG. 1800

Block pulleys 3 to 11-inch diameters, inclusive, are made of maple and are clamped to the shaft by compression bolts of varying size and number suitable to the diameter and face of the pulley in which they are used. These bolts are covered by a removable cap, which is held in place by small slotted head bolts.

12" to 36" Diameter

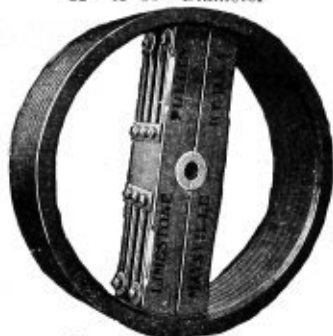


FIG. 1799

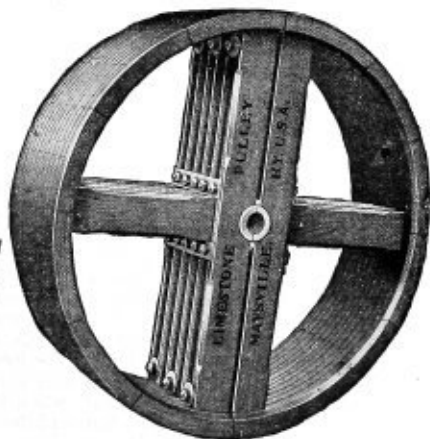


FIG. 1801

Pulleys 37 to 83 inches in diameter are constructed in this manner; 84-inch diameter, and larger, are built with such additional arms as the diameter of the pulley makes necessary.

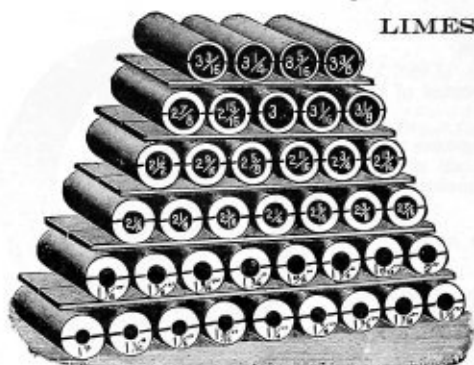


FIG. 1802

LIMESTONE WOOD PULLEYS
CONTINUED

WOOD BUSHINGS

One complete bushing of length required by pulley hub is furnished with each pulley without charge.

These bushings are made in halves, exclusively from selected hard maple, thoroughly air-seasoned and kiln-dried, turned on the outside and bored on the inside to exact size.

Price List of Split Loose Bushings

O. D. Inches	Bore Inches	LENGTH, INCHES						
		4½	5½	6½	7½	9½	10½	12½
2-15	1-3	\$2.75	3.10	3.50	3.90	.....	.....	.....
2-15	1-7	3.00	3.50	4.00	4.50	\$5.50	6.00	8.00
2-15	1-11	3.25	3.85	4.45	5.10	6.30	6.90	9.00
2-15	1-15	3.55	4.25	4.95	5.70	7.10	7.80	10.00
3½	2-3	3.85	4.65	5.50	6.35	8.05	8.90	11.15
3½	2-7	4.15	5.10	6.05	7.00	9.00	10.00	12.30
3½	2-11	4.55	5.60	6.65	7.70	9.95	11.10	13.45
4-7	2-15	.....	.....	.....	8.30	10.90	12.20	14.60
4-7	3-3	.....	.....	.....	8.90	11.85	13.30	15.75
4-7	3-7	.....	.....	.....	9.50	12.80	14.40	16.90

BORE OF STOCK PULLEYS

Diameter	inches	3	4 to 7	8 and Larger
Standard Bore	inches	1 $\frac{1}{4}$	2 $\frac{1}{4}$	3 $\frac{1}{4}$

If desired, 6 and 7-inch diameter pulleys can be bored 3½-inch; 50-inch and larger can be bored 4½-inch and furnished with interchangeable bushings.

EXTRA PRICE FOR LARGE BORES

Size of Bore, Inches	Add to List 15 Per Cent	Add to List 20 Per Cent	Add to List 25 Per Cent
Under 12 .....diam.	$3\frac{1}{16}$ to 4	$4\frac{1}{16}$ to 5	$5\frac{1}{16}$ to 6
From 12 to 48.....diam.	$4\frac{1}{16}$ to $4\frac{1}{2}$	$4\frac{1}{16}$ to 6	$6\frac{1}{16}$ to $7\frac{1}{2}$
From 49 to 72.....diam.	$5\frac{1}{16}$ to 6	$6\frac{1}{16}$ to $7\frac{1}{2}$	$7\frac{1}{16}$ to $9\frac{1}{2}$
From 73 to 96.....diam.	$7\frac{1}{16}$ to 8	$8\frac{1}{16}$ to 10	$10\frac{1}{16}$ to 12
From 97 to 120.....diam.	$9\frac{1}{16}$ to 10	$10\frac{1}{16}$ to $12\frac{1}{2}$	$12\frac{1}{16}$ to 15

For bores in excess of above limits, net prices will be quoted on application.

For boring pulleys to fit shaft when bore is less than standard, or for boring pulleys larger than standard but smaller than bores shown in the table, add 10 per cent to regular list.

For a pulley whose diameter is expressed in fractions of an inch, or in odd inches not listed, use the list of the next larger diameter listed.

For a pulley whose face width is expressed in fractions of an inch or in odd inches not listed, use the list of the next larger face listed. Pulleys having a narrower face than is listed take the list of the narrowest face listed.

We absolutely guarantee every Limestone Pulley to give satisfaction in every respect and to be in every way as represented. Should one of them fail in this it may be returned at our expense and money will be refunded or a new pulley given instead.

LIMESTONE WOOD PULLEYS

STANDARD REVISED WOOD SPLIT PULLEY PRICE LIST

EFFECTIVE DECEMBER 1ST, 1908

Diam. Inches	WIDTH OF FACE												
	3	4	5	6	8	10	12	14	16	18	20	22	24
4	2.80	2.90	3.10	3.30	3.70	4.10	4.50	.....	.....	.....	.....	.....	.....
5	2.85	2.95	3.20	3.40	3.85	4.30	4.75	.....	.....	.....	.....	.....	.....
6	2.90	3.00	3.25	3.50	4.00	4.50	5.00	.....	.....	.....	.....	.....	.....
7	2.95	3.05	3.35	3.60	4.15	4.70	5.25	5.80	.....	.....	.....	.....	.....
8	3.00	3.10	3.40	3.70	4.30	4.90	5.50	6.10	.....	.....	.....	.....	.....
9	3.10	3.25	3.60	3.90	4.55	5.20	5.85	6.50	.....	.....	.....	.....	.....
10	3.25	3.40	3.75	4.10	4.80	5.50	6.20	6.90	7.60	.....	.....	.....	.....
11	3.50	3.70	4.10	4.50	5.30	6.10	6.90	7.70	8.50	.....	.....	.....	.....
12	3.75	4.00	4.45	4.90	5.80	6.70	7.60	8.50	9.40	10.20	.....	.....	.....
13	4.00	4.30	4.80	5.30	6.30	7.30	8.30	9.30	10.30	11.30	.....	.....	.....
14	4.60	5.15	5.70	6.80	7.90	9.00	10.10	11.20	12.30	13.40	.....	.....	.....
15	4.90	5.50	6.10	7.30	8.50	9.70	10.90	12.10	13.30	14.50	.....	.....	.....
16	5.20	5.85	6.50	7.80	9.10	10.40	11.70	13.00	14.30	15.60	16.90	.....	.....
17	5.50	6.20	6.90	8.30	9.70	11.10	12.50	13.90	15.30	16.70	18.10	.....	.....
18	5.80	6.55	7.30	8.80	10.30	11.80	13.30	14.80	16.30	17.80	19.30	20.80	.....
19	6.10	6.90	7.70	9.30	10.90	12.50	14.10	15.70	17.30	18.90	20.50	22.10	.....
20	6.40	7.25	8.10	9.80	11.50	13.20	14.90	16.60	18.30	20.00	21.70	23.40	.....
22	7.00	7.95	8.90	10.80	12.70	14.60	16.50	18.40	20.30	22.20	24.10	26.00	.....
24	7.70	8.80	9.90	12.10	14.30	16.50	18.70	20.90	23.10	25.30	27.50	29.70	.....
26	8.40	9.65	10.90	13.40	15.90	18.40	20.90	23.40	25.90	28.40	30.90	33.40	.....
28	9.10	10.50	11.90	14.70	17.50	20.30	23.10	25.90	28.70	31.50	34.30	37.10	.....
30	9.80	11.35	12.90	16.00	19.10	22.20	25.30	28.40	31.50	34.60	37.70	40.80	.....
32	10.50	12.20	13.90	17.30	20.70	24.10	27.50	30.90	34.30	37.70	41.10	44.50	.....
34	11.30	13.15	15.00	18.70	22.40	26.10	29.80	33.50	37.20	40.90	44.60	48.30	.....
36	12.10	14.10	16.10	20.10	24.10	28.10	32.10	36.10	40.10	44.10	48.10	52.10	.....
38	.....	.....	17.20	21.50	25.80	30.10	34.40	38.70	43.00	47.30	51.60	55.90	.....
40	.....	.....	18.30	22.90	27.50	32.10	36.70	41.30	45.90	50.50	55.10	59.70	.....
42	.....	.....	19.60	24.60	29.60	34.60	39.60	44.60	49.60	54.60	59.60	64.60	.....
44	.....	.....	20.90	26.30	31.70	37.10	42.50	47.90	53.30	58.70	64.10	69.50	.....
46	.....	.....	22.30	28.10	33.90	39.70	45.50	51.30	57.10	62.90	68.70	74.50	.....
48	.....	.....	23.80	30.00	36.20	42.40	48.60	54.80	61.00	67.20	73.40	79.60	.....
50	.....	.....	25.40	32.00	38.60	45.20	51.80	58.40	65.00	71.60	78.20	84.80	.....
52	.....	.....	27.10	34.10	41.10	48.10	55.10	62.10	69.10	76.10	83.10	90.10	.....
54	.....	.....	28.90	36.30	43.70	51.10	58.50	65.90	73.30	80.70	88.10	95.50	.....
56	.....	.....	30.80	38.60	46.40	54.20	62.00	69.80	77.60	85.40	93.20	101.00	.....
58	.....	.....	32.80	41.00	49.20	57.40	65.60	73.80	82.00	90.20	98.40	106.60	.....
60	.....	.....	34.90	43.50	52.10	60.70	69.30	77.90	86.50	95.10	103.70	112.30	.....
62	.....	.....	37.10	46.10	55.10	64.10	73.10	82.10	91.10	100.10	109.10	118.10	.....
64	.....	.....	39.40	48.80	58.20	67.60	77.00	86.40	95.80	105.20	114.60	124.00	.....
66	.....	.....	41.90	51.80	61.70	71.60	81.50	91.40	101.30	111.20	121.10	131.00	.....
68	.....	.....	44.50	54.90	65.30	75.70	86.10	96.50	106.90	117.30	127.70	138.10	.....
70	.....	.....	47.20	58.10	69.00	79.90	90.80	101.70	112.60	123.50	134.40	145.30	.....
72	.....	.....	50.00	61.40	72.80	84.20	95.60	107.00	118.40	129.80	141.20	152.60	.....
74	.....	.....	.....	71.90	84.80	97.70	110.60	123.50	136.40	149.30	162.20	175.10	.....
76	.....	.....	.....	83.30	97.70	112.10	126.50	140.90	155.30	169.70	184.10	198.50	.....
78	.....	.....	.....	95.60	111.50	127.40	143.30	159.20	175.10	191.00	206.90	222.80	.....
80	.....	.....	.....	109.00	128.50	144.00	161.50	179.00	196.50	214.00	231.50	249.00	.....
82	.....	.....	.....	123.70	143.00	162.30	181.60	200.90	220.20	239.50	258.80	278.10	.....
84	.....	.....	.....	139.30	160.40	181.50	202.60	223.70	244.80	265.90	287.00	308.10	.....
86	.....	.....	.....	155.80	178.70	201.60	224.50	247.40	270.30	293.20	316.10	339.00	.....
88	.....	.....	.....	173.20	197.90	222.60	247.20	272.00	296.70	321.40	346.10	370.80	.....

PAPER PULLEYS

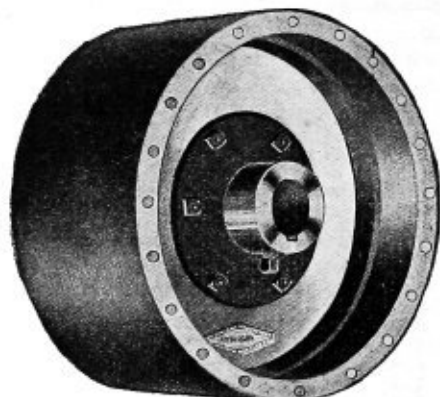


FIG. 1803

Paper pulleys have a very high belt efficiency. They are economical because of reduced slippage, decreased belt tension and increased power transmission, resulting in a lower total cost. Not injured by steam or atmospheric conditions. Made up to 72 inches in diameter. Larger sizes than listed and intermediate sizes quoted on application.

Diam., Inches	Width of Face, Inches														
	2	3	4	5	6	7	8	9	10	12	14	16	18	20	22
2	\$2.00	\$2.05	\$2.10	\$2.20	\$2.35	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2 1/4	2.05	2.10	2.15	2.25	2.40	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
3	2.10	2.15	2.20	2.30	2.45	\$2.65	.....	.....	.....	.....	.....	.....	.....	.....	.....
3 1/4	2.15	2.20	2.25	2.35	2.50	2.70	\$2.95	.....	.....	.....	.....	.....	.....	.....	.....
4	2.20	2.25	2.30	2.40	2.55	2.75	3.00	.....	.....	.....	.....	.....	.....	.....	.....
4 1/4	2.25	2.30	2.35	2.45	2.60	2.80	3.05	\$3.35	.....	.....	.....	.....	.....	.....	.....
5	2.30	2.35	2.40	2.50	2.65	2.85	3.10	\$3.75	.....	.....	.....	.....	.....	.....	.....
5 1/4	2.35	2.40	2.45	2.55	2.70	2.90	3.15	3.45	3.80	.....	.....	.....	.....	.....	.....
6	.....	3.05	3.15	3.25	3.45	3.70	4.00	4.40	4.80	.....	.....	.....	.....	.....	.....
7	.....	3.20	3.25	3.40	3.65	3.80	4.15	4.50	4.95	\$5.00	.....	.....	.....	.....	.....
8	.....	3.40	3.45	3.65	3.75	4.00	4.30	4.70	5.10	6.20	.....	.....	.....	.....	.....
9	.....	3.55	3.65	3.75	3.95	4.20	4.50	4.90	5.30	6.40	.....	.....	.....	.....	.....
10	.....	3.75	3.80	3.95	4.15	4.40	4.70	5.05	5.50	6.55	.....	.....	.....	.....	.....
11	.....	4.00	4.15	4.30	4.55	4.90	5.25	5.70	6.20	7.40	.....	.....	.....	.....	.....
12	.....	4.25	4.45	4.70	5.00	5.40	5.80	6.30	6.90	8.20	.....	.....	.....	.....	.....
13	.....	4.50	4.75	5.05	5.45	5.90	6.40	6.95	7.55	9.00	.....	.....	.....	.....	.....
14	.....	4.75	5.00	5.30	5.70	6.10	6.60	7.20	7.80	9.25	.....	.....	.....	.....	.....
15	.....	5.00	5.30	5.70	6.10	6.60	7.20	7.80	8.50	10.05	.....	.....	.....	.....	.....
16	.....	5.30	5.70	6.10	6.60	7.20	7.80	8.50	9.25	10.95	\$12.90	.....	.....	.....	.....
18	.....	5.95	6.45	7.00	7.60	8.30	9.05	9.90	10.75	12.70	14.90	.....	.....	.....	.....
20	.....	7.15	7.75	8.45	9.20	10.00	10.90	11.85	13.90	16.20	.....	.....	.....	.....	.....
22	.....	8.00	8.75	9.55	10.45	11.40	12.40	13.45	15.75	18.30	\$21.10	.....	.....	.....	.....
24	.....	8.80	9.60	10.50	11.45	12.45	13.50	14.60	17.05	19.75	22.70	.....	.....	.....	.....
28	.....	.....	11.80	12.95	14.10	15.40	16.70	18.05	21.00	24.20	27.60	\$31.30	.....	.....	.....
32	.....	.....	14.05	15.40	16.75	18.20	19.70	21.25	24.55	28.10	31.95	36.00	\$40.30	.....	.....
36	.....	.....	16.50	18.00	19.55	21.20	22.90	24.60	28.30	32.25	36.45	40.90	45.65	.....	.....
40	.....	.....	19.10	20.80	22.65	24.40	26.25	28.20	32.25	36.55	41.00	46.95	51.00	\$56.30	.....
48	.....	.....	.....	28.55	30.75	33.00	35.30	37.10	42.65	47.80	53.25	58.95	64.90	71.55	.....

DODGE SOLID FRICTION CLUTCHES

PARTICULARLY ADAPTED FOR COUNTERSHAFT USE

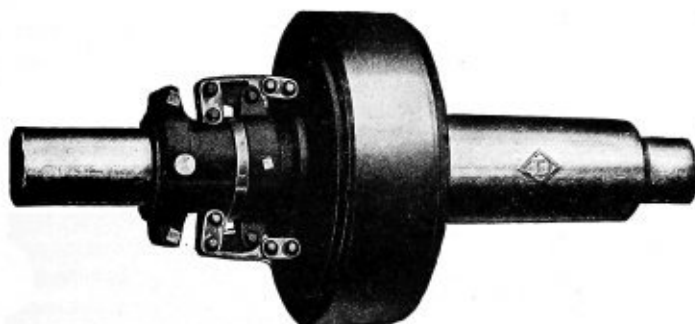


FIG. 1804

PRICE LIST OF DODGE SOLID FRICTION CLUTCHES

Size of Clutch Inches	H. P. at 100 R. P. M.	Largest Bore Possible Inches	Length of Standard Sleeve Inches	Maximum Pulley Face Allowable on Standard Sleeve Inches	Speed* R. P. M.	Price	
						Clutch with Standard Length Iron Sleeve	Additional Length of Sleeve Per Inch
4	1 $\frac{1}{4}$	1 $\frac{1}{4}$	4 $\frac{1}{2}$	4	600	\$15.00	\$1.00
5	2	1 $\frac{1}{2}$	5	4 $\frac{1}{2}$	580	17.00	1.10
6	3	1 $\frac{3}{4}$	6	5 $\frac{1}{2}$	560	20.00	1.20
7	4	2	7	6 $\frac{1}{4}$	540	22.00	1.30
8	5	2 $\frac{1}{4}$	8	7 $\frac{1}{4}$	520	27.00	1.40
9	6	2 $\frac{1}{2}$	10	9 $\frac{1}{4}$	500	30.00	1.50
10	10	3	11	10 $\frac{1}{4}$	480	37.00	1.60
12	15	3	12	11	440	45.00	1.70
12 Spl.	15	4	12	11	440	55.00	2.50
14	30	3 $\frac{1}{2}$	13	12	400	65.00	2.00
14 Spl.	30	5	13	12	400	75.00	3.00
16	50	4 $\frac{1}{2}$	14	13	360	100.00	2.25
16 Spl.	50	6	14	13	360	115.00	3.25

*Speeds shown above are for clutches as regularly built for ordinary factory requirements. When desired for higher speed than shown above, prices will be quoted upon request accompanied by full information.

DODGE PATENT SPLIT FRICTION CLUTCHES

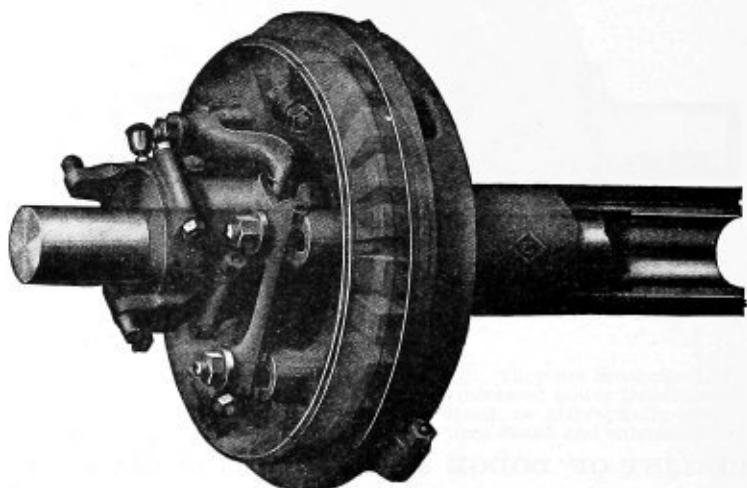


FIG. 1805

The split feature of these clutches is a most valuable one, and makes possible two things of great importance and value—

(1) The easy and ready installation of the equipment upon a shaft already in place without taking down the shaft or disturbing any of the equipment upon same, and

(2) The greatest possible facility in the taking off of old parts and the substitution of new, in the event that any repairs or renewals are necessary.

In connection with all of our larger clutches, we employ this split type exclusively, because of the advantages above mentioned.

An important feature of the Dodge Split Clutch is its great frictional power, same being obtained through an outside disc into which are driven hard maple blocks presenting end grain, an inside driving plate which is keyed to the shaft, and an outside driving plate attached to inside driving plate and levers. By a movement of levers, the driving plates are brought in contact with the wooden blocks, thus transmitting the power to sleeve.

Any kind of a pulley, shaft, gear or sprocket can be mounted upon the sleeve of these clutches. The extensive use of jigs and templets in connection with the manufacture of all the various parts of these clutches insures their absolute interchangeability and perfect fit.

HYATT HANGER FRAMES

Cut shows Hyatt Box mounted in a Standard
4-point Set Screw Hanger.



FIG. 1806

LIST PRICES CAST IRON HANGER FRAMES (FRAMES ONLY)

Diam. Shaft Inches	Drop Hangers—Drop in Inches												Post Hangers	Pillow Blocks
	7 in.	10 in.	13 in.	16 in.	19 in.	22 in.	25 in.	28 in.	31 in.	34 in.				
1 ¹ / ₁₆	\$ 7.50	8.80	10.15	10.30	11.25	12.90	13.50	.....	.....	.....	.....	.....	4.00	
1 ¹ / ₈	7.50	8.80	10.15	10.30	11.25	12.90	13.50	.....	.....	.....	.....	.....	4.00	
1 ¹ / ₄	10.15	11.80	13.95	14.15	15.55	17.70	21.50	21.70	23.75	.....	.....	9.60	6.00	
2 ¹ / ₁₆	10.15	11.80	13.95	14.15	15.55	17.70	21.50	21.70	23.75	.....	.....	9.60	6.00	
2 ¹ / ₈	12.35	16.65	19.90	20.15	24.20	27.50	30.70	31.00	.....	.....	.....	13.80	9.80	
2 ¹ / ₄	12.35	16.65	19.90	20.15	24.20	27.50	30.70	31.00	.....	.....	.....	22.00	9.80	
2 ³ / ₈	23.00	24.20	29.60	29.80	35.00	38.20	42.10	42.30	42.70	44.80	.....	22.00	15.80	
3 ¹ / ₁₆	23.00	24.20	29.60	29.80	35.00	38.20	42.10	42.30	42.70	44.80	.....	29.60	15.80	
3 ¹ / ₈	27.50	29.60	.....	35.00	41.50	45.80	50.00	.....	54.40	.....	.....	29.60	18.70	
3 ¹ / ₄	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	51.20	.....	
3 ³ / ₈	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	51.20	.....	
4 ¹ / ₁₆	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	51.20	.....	
4 ¹ / ₈	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
5 ¹ / ₁₆	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
5 ¹ / ₈	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	

STEEL HANGER FRAMES (FRAMES ONLY)

Diam. Shaft Inches	Drop Hangers—Drop in Inches						Post Hangers
	6 in.	8 in.	11 in.	15 in.	19 in.	23 in.	
1 ¹ / ₁₆	\$ 6.25	6.25	6.95	8.20	9.65	.....	6.85
1 ¹ / ₈	6.25	6.25	6.95	8.20	9.65	.....	6.85
1 ¹ / ₄	6.85	6.85	7.65	9.05	10.60	15.55	9.85
2 ¹ / ₁₆	10.80	10.80	11.35	13.00	14.75	17.10	9.85
2 ¹ / ₈	10.80	10.80	11.35	13.00	14.75	17.10	12.80
2 ¹ / ₄	.....	14.10	14.10	16.90	20.70	23.50	12.80
2 ³ / ₈	.....	14.10	14.10	16.90	20.70	23.50	12.80

HYATT FLEXIBLE ROLLER BEARINGS FOR LINE SHAFTING

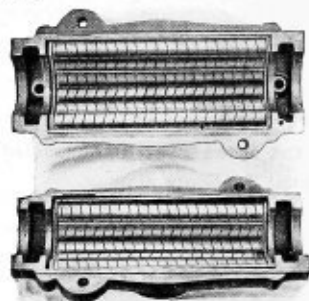


FIG. 1807

Friction is waste. And friction in transmitting power in the average plant consumes fifteen per cent of the total power. If your power costs you forty or fifty dollars per horsepower year, isn't it worth while to make this power productive to the greatest possible extent?

Minimize your friction losses by substituting a roller bearing for those babblitted bearings on your line shafting—substitute a rolling motion for a rubbing friction.

LIST PRICES HYATT STANDARD SHAFTHING BOXES

The following list prices are for boxes only, suitable for frames having four set screw adjustments, for ball and socket frames and for universal giant frames.

LINE SHAFT BEARINGS ONLY

Diameter of Shaft.....Inches	1 $\frac{1}{16}$	1 $\frac{1}{8}$	1 $\frac{1}{4}$	1 $\frac{3}{8}$	1 $\frac{1}{2}$	1 $\frac{5}{8}$	2	2 $\frac{1}{8}$	2 $\frac{1}{2}$	3
List Price	\$11.35	12.85	13.70	18.00	22.40	26.85	31.70	37.25		
Diameter of Shaft.....Inches	3 $\frac{1}{8}$	3 $\frac{1}{2}$	3 $\frac{3}{4}$	4	4 $\frac{1}{2}$	4 $\frac{3}{4}$	5	5 $\frac{1}{2}$	5 $\frac{3}{4}$	6
List Price	\$83.70	109.25	135.75	158.90	190.40	281.25	390.00			

Even inches and their fractions take list of nearest sixteenth plus 10 per cent in sizes up to and including 3 $\frac{3}{4}$ inches. Above that list is the same.

DIMENSIONS OF HYATT STANDARD BOXES

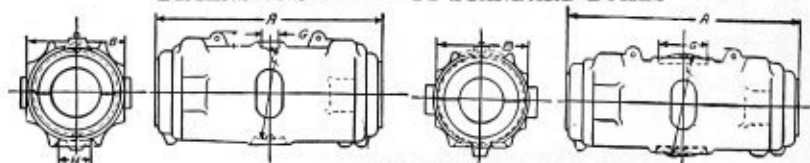


FIG. 1808

Either U-G or E. & S. boxes may be used in four set screw hangers

Diam. of Shaft, Inches	Approx. Weight, Lbs.	A		B		F		G		H
		BS	UG	BS	UG	BS	UG	BS	UG	UG
1 $\frac{1}{16}$	11	8 $\frac{1}{4}$	8 $\frac{1}{4}$	3 $\frac{3}{4}$	3 $\frac{3}{4}$	3 $\frac{3}{4}$	3 $\frac{3}{4}$	1 $\frac{1}{2}$	1 $\frac{1}{4}$	1 $\frac{1}{2}$
1 $\frac{1}{8}$	14	9 $\frac{1}{4}$	9 $\frac{1}{4}$	3 $\frac{3}{4}$	3 $\frac{3}{4}$	3 $\frac{3}{4}$	4	1 $\frac{1}{2}$	1 $\frac{1}{4}$	1 $\frac{1}{2}$
1 $\frac{1}{4}$	22	10 $\frac{1}{2}$	10 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{7}{8}$	2 $\frac{1}{2}$	1 $\frac{3}{4}$	2 $\frac{1}{2}$
1 $\frac{3}{8}$	27	11 $\frac{1}{2}$	11 $\frac{1}{2}$	4 $\frac{7}{8}$	4 $\frac{7}{8}$	4 $\frac{7}{8}$	5	2 $\frac{1}{2}$	1 $\frac{3}{4}$	2 $\frac{1}{2}$
1 $\frac{1}{2}$	33	13	13	5 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{3}{4}$	3	1 $\frac{3}{4}$	2 $\frac{1}{2}$
1 $\frac{5}{8}$	46	14	14	5 $\frac{7}{8}$	5 $\frac{7}{8}$	5 $\frac{7}{8}$	6	3	1 $\frac{3}{4}$	2 $\frac{1}{2}$
2	60	15 $\frac{1}{4}$	15 $\frac{1}{4}$	6	6	6 $\frac{1}{4}$	6 $\frac{1}{4}$	3 $\frac{1}{2}$	2 $\frac{1}{4}$	2 $\frac{1}{2}$
2 $\frac{1}{8}$	67	16 $\frac{1}{2}$	16 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{3}{4}$	3 $\frac{1}{2}$	2 $\frac{1}{4}$	2 $\frac{1}{2}$
2 $\frac{1}{4}$	110	17 $\frac{1}{4}$	17 $\frac{1}{4}$	7 $\frac{1}{4}$	7 $\frac{1}{4}$	7 $\frac{1}{4}$	7 $\frac{3}{4}$	3 $\frac{3}{4}$	2 $\frac{3}{4}$	2 $\frac{1}{2}$
2 $\frac{3}{8}$	182	19 $\frac{1}{2}$	...	8 $\frac{1}{4}$	...	10 $\frac{1}{2}$	...	4 $\frac{3}{4}$	...	...

"BOND" LYTESTRONG STEEL SHAFT HANGER
UNIVERSAL ADJUSTMENT - BABBITTED AND REAMED BEARINGS
ONE HALF THE WEIGHT OF CAST IRON HANGERS

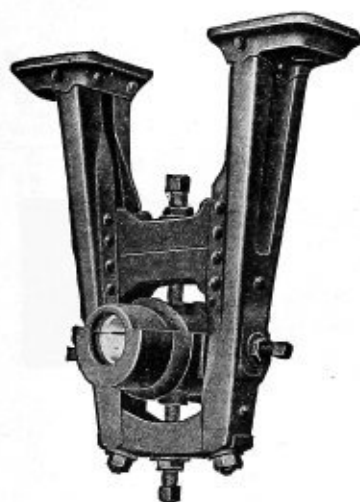


FIG. 1809

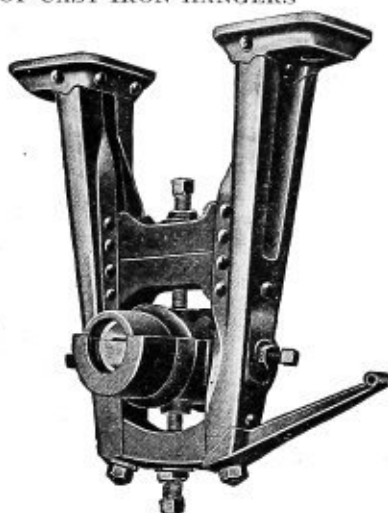


FIG. 1810

Shaft Size	Drop, Inches	Price With Ring-Oiling Bearings	Price With Wick-Oiling Bearings	Shaft Size	Drop, Inches	Price With Ring-Oiling Bearings	Price With Wick-Oiling Bearings
1 ³ / ₁₆	8	\$5.25	4.50	1 ¹ / ₄	16	\$7.05	6.30
	10	5.40	4.65		18	7.75	7.00
	12	5.55	4.80		20	8.20	7.55
	14	5.90	5.15		8	7.00	6.00
	16	6.30	5.55	1 ³ / ₈	10	7.15	6.15
	18	7.00	6.25		12	7.30	6.30
	20	7.55	6.80		14	7.65	6.65
1 ⁷ / ₁₆	8	5.75	4.75		16	8.05	7.05
	10	5.90	4.90		18	8.75	7.75
	12	6.05	5.05		20	9.30	8.30
	14	6.40	5.40	2 ³ / ₁₆	8	7.50	6.50
	16	6.80	5.80		10	7.65	6.65
	18	7.50	6.50		12	7.80	6.80
	20	8.05	7.05		14	8.15	7.15
1 ¹ / ₂	8	6.00	5.25		16	8.55	7.55
	10	6.15	5.40		18	9.25	8.25
	12	6.30	5.55		20	9.80	8.80
	14	6.65	5.90				

WITH BELT SHIFTER ARM

The arm is easily attached, perfectly rigid and unbreakable. Shifting attachments for counter shafts consist of the following parts: 2 Arms, 2 Collars, 2 Fingers, 1 Lever Clamp.

PRICE LIST
Fixtures Without Arms, \$2.50

Length of arm	inches	9	11	13	15
Price	per arm	\$0.70	.80	.90	1.00

"BOND" PATENT UNIVERSAL DROP HANGERS
RING OILING—BALL AND SOCKET—UNIVERSAL ADJUSTMENT
DOUBLE BRACED



FIG. 1811

Bearings Babbitted and Reamed

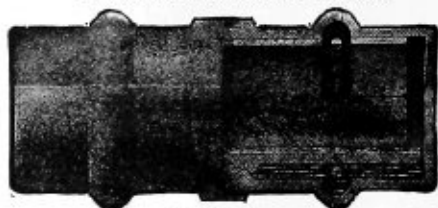


FIG. 1812

The Bond Cast Iron Hanger is designed upon lines so as to distribute the metal in order that there is ample sufficiency of iron where it is most required and where the greatest strain takes place.

The Hanger Yoke is cast separate and is interchangeable with any drop of the same size shaft. This applies also to Universal Post Hangers, Pillow Blocks and Bracket Hangers.

The Bolts supporting the Yoke are integral with the Frame proper; thus strengthening the Hanger at one of the most important points that carry the load of the line shaft.

Bearings are Babbitted and Reamed, making a perfect true bearing surface throughout.

Point marked B & S shows that the shafting shell or the bearing proper has a full Ball and Socket bearing and adjustment on the lower portion of the box (or reservoir) which is the main support.

Tempered Spring Steel Rings are used to carry oil to the shaft. Diameter of Rings sufficiently larger than shaft to allow them to revolve freely and constantly in oil, thus keeping the shaft evenly and well lubricated.

Each end of the bearing is provided with carefully designed scrapers or wipers to remove any surplus oil and return it to the reservoir, thus preventing any leakage or dripping.

Reservoir when properly filled will amply lubricate the shaft from six to eight months' time without refilling.

This bearing is interchangeable with the Universal Drop Hanger, Universal Post Hanger, Universal Pillow Block, Universal Bracket Hanger, and Pedestal Pillow Block.

"BOND" PATENT UNIVERSAL RING OILING DROP HANGERS—CONTINUED

PRICE LIST

Shaft Size Inches	RANGE OF DROPS IN INCHES										
	4-5 1/4	6-8	8-10	11-13	14-16	18-20	19-21	22-24	26-28	30-32	34-36
1 1/8	\$3.25	3.50	3.75	4.25	4.75	.....	.....	.....	.....	.....	.....
1 1/4	4.00	4.50	4.75	5.25	5.75	6.50	7.00	7.50	.....	.....	.....
1 1/2	4.50	5.00	5.25	5.75	6.25	7.00	7.50	8.00	.....	.....	.....
1 3/4		6.00	6.25	6.75	7.25	7.75	7.90	8.50	10.75	12.50	14.50
1 7/8		7.00	7.25	7.75	8.25	8.75	8.90	9.50	11.75	13.50	15.50
2 1/8			9.25	9.75	10.50	11.25	11.75	12.25	14.00	16.00	19.00
2 1/4			10.25	10.75	11.50	12.25	12.75	13.25	15.00	17.00	20.00
2 1/2			12.50	14.00	15.00	17.00	17.75	18.50	20.00	23.00	26.00
2 3/4			14.50	16.00	17.00	19.00	19.75	20.50	22.00	25.00	28.00
3 1/8			19.50	20.50	22.50	25.00	25.75	26.50	28.50	30.50	33.50
3 1/4			21.50	22.50	24.50	27.00	27.75	28.50	30.50	32.50	35.50
3 1/2			25.50	26.50	28.50	31.50	.....	33.50	35.50	37.50	40.50
3 3/4			27.50	28.50	30.50	33.50	.....	35.50	37.50	39.50	42.50
4 1/8				36.00	38.00	40.50	.....	43.50	47.00	51.00	55.00
4 1/4				39.00	41.00	43.50	.....	46.50	50.00	54.00	58.00
4 1/2				43.50	46.00	49.00	.....	52.00	55.50	60.50	65.50
4 3/4				46.00	48.50	51.50	.....	54.50	58.00	63.00	68.00

PRICE LIST OF ADDITIONAL PATTERNS

Shaft Size Inches	RANGE OF DROPS IN INCHES							
	8 1/2-9 1/2	10-12	13-15	13 1/2 x 15 1/2	16-18	19-21	20-22	24-26
1 1/8	.....	4.00	4.50	.....	5.25	.....	.....	.....
1 1/4	\$4.75	5.00	5.50	.....	6.00	.....	.....	.....
1 1/2	5.25	5.50	6.00	.....	6.50	.....	.....	.....
1 3/4	6.25	6.50	7.00	.....	7.50	.....	8.00	9.50
1 7/8	7.25	7.50	8.00	.....	8.50	.....	9.00	10.50
2 1/8	.....	9.50	.....	.....	.....	.....	.....	13.25
2 1/4	.....	10.50	.....	.....	.....	.....	.....	14.25
2 1/2	.....	13.50	.....	.....	16.00	.....	.....	21.50
2 3/4	.....	15.50	.....	.....	18.00	.....	.....	19.50
3 1/8	.....	.....	.....	.....	.....	.....	.....	27.50
3 1/4	.....	.....	.....	.....	.....	.....	.....	29.50
5 1/8	.....	.....	.....	110.00	.....	125.00	.....	.....
5 1/4	.....	.....	.....	120.00	.....	.....	.....	.....
6 1/8	.....	.....	.....	150.00	.....	.....	.....	.....
6 1/4	.....	.....	.....	175.00	.....	.....	.....	.....

Special base plates can be furnished if desired to increase drops of Hangers 5 1/8 and above.

THE DODGE ADJUSTABLE BALL AND SOCKET DROP HANGERS

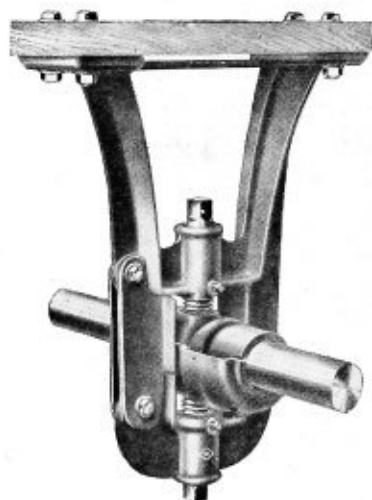


FIG. 1813

FITTED WITH EITHER

STANDARD
WICK-OILING
CAPILLARY
RING OR
CHAIN OILING
BEARINGS

A most complete line for selection to meet
any requirement.

Standard Bearing



FIG. 1814

Wick-Oiling



FIG. 1815

Capillary-Oiling

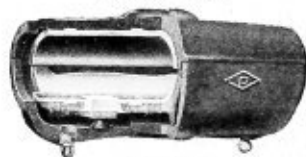


FIG. 1816

Ring or Chain Oiling



FIG. 1817

THE "BOND" UNIVERSAL RING OILING BRACKET HANGER

BEARINGS BABBITTED AND REAMED

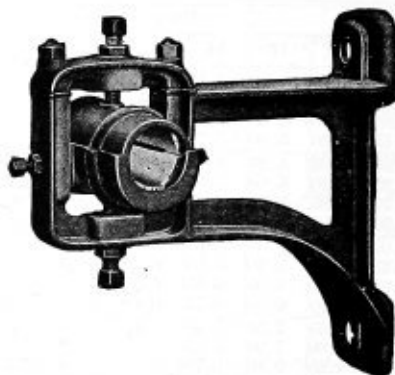


FIG. 1818

Shaft Size, Inches	Reach, Inches	List Price	Shaft Size, Inches	Reach, Inches	List Price
1 ¹ / ₁₆	10	\$5.00	2 ¹ / ₁₆	14	\$11.50
"	12	5.50	"	16	13.00
"	14	6.00	"	18	14.50
"	16	6.50	"	20	16.00
1 ¹ / ₈	10	5.50	2 ¹ / ₈	10	10.50
"	12	6.00	"	12	11.25
"	14	6.50	"	14	12.50
"	16	7.00	"	16	14.00
1 ¹ / ₂	10	6.50	"	18	15.50
"	12	7.00	"	20	17.00
"	14	7.75	2 ¹ / ₂	10	14.00
"	16	8.50	"	12	15.00
"	18	9.25	"	14	16.50
"	20	10.00	"	16	18.00
1 ³ / ₈	10	7.50	"	18	21.00
"	12	8.00	"	20	25.00
"	14	8.75	2 ³ / ₈	10	16.00
"	16	9.50	"	12	17.00
"	18	10.25	"	14	18.50
"	20	11.00	"	16	20.00
2 ¹ / ₈	10	9.50	"	18	23.00
"	12	10.25	"	20	27.00

THE DODGE ADJUSTABLE BALL AND SOCKET POST HANGERS

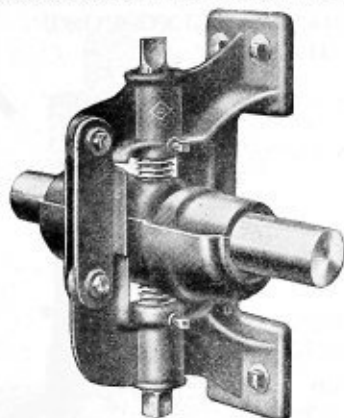


FIG. 1819
Standard Bearing



FIG. 1820
Capillary Oiling

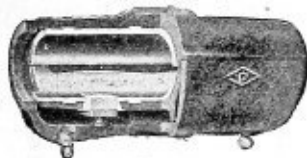


FIG. 1822

FITTED WITH EITHER

STANDARD, WICK-OILING,
CAPILLARY, RING OR
CHAIN OILING BEARINGS

Most complete line made.

Wick-Oiling



FIG. 1821
Chain or Ring

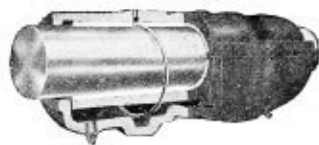


FIG. 1823

PRICE LIST

Kind of bearing.....inches	Shaft Sizes						
	1 ⁵ / ₁₆	1 ³ / ₁₆	1 ¹ / ₁₆	1 ¹ / ₁₆	1 ¹⁵ / ₁₆	2 ¹ / ₁₆	2 ⁷ / ₁₆
Standard	\$4.40	\$4.50	\$5.50	\$5.60	\$7.15	\$9.75	\$10.40
Wick-oiling		4.70	5.85	5.95	7.60	10.30	11.10
Capillary	5.35	5.50	6.30	6.55	9.05	11.75	12.35
Ring or chain.....		5.70	6.50	6.75	9.30	12.00	12.65

Kind of bearing.....inches	Shaft Sizes					
	2 ¹¹ / ₁₆	2 ¹⁵ / ₁₆	3 ¹ / ₁₆	3 ⁷ / ₁₆	3 ¹¹ / ₁₆	3 ¹⁵ / ₁₆
Standard	\$13.00	\$14.95	\$19.00	\$19.45	\$25.45	\$28.70
Wick-oiling	13.80	16.10	20.40	20.85	27.50	31.40
Capillary	15.60	18.35	27.30	29.65	34.05	35.80
Ring or chain.....	15.95	18.70	27.70	30.15	34.60	36.40

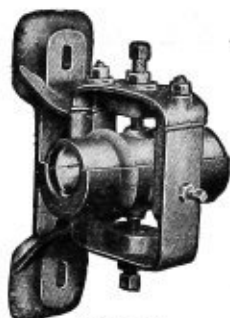


FIG. 1824

THE "BOND" UNIVERSAL BALL AND SOCKET RING OILING POST HANGER

BEARINGS BABBITTED AND REAMED
SIDE ADJUSTMENT ONE-HALF INCH.
VERTICAL ONE INCH

THE "BOND" UNIVERSAL BALL AND SOCKET RING OILING PILLOW BLOCK

BEARINGS BABBITTED AND REAMED
SIDE ADJUSTMENT
ONE-HALF INCH
VERTICAL ONE INCH



FIG. 1826



FIG. 1825

THE "BOND" PEDESTAL PILLOW BLOCK

FITTED WITH RING OILING BEARINGS, BALL
AND SOCKET ADJUSTMENT
BEARINGS BABBITTED AND REAMED

PRICES ON ABOVE

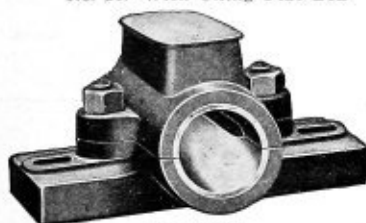
Size Shaft, Inches	Price B&S Post Hanger, Each	Price Universal Pillow Block, Each	Price Pedestal Pillow Block, Each
$\frac{1}{8}$	\$ 3.75	\$3.50	\$3.50
$\frac{1}{4}$	4.75	4.50	4.00
$\frac{1}{2}$	5.25	5.00	4.75
$\frac{3}{4}$	6.00	6.00	5.50
$1\frac{1}{4}$	7.00	7.00	7.00
$2\frac{1}{4}$	9.25	8.75	8.00
$3\frac{1}{4}$	10.25	9.75	9.50
$4\frac{1}{4}$	13.50	11.50	11.00
$5\frac{1}{4}$	15.50	13.50	13.75
$6\frac{1}{4}$	20.00	19.00	17.00
$8\frac{1}{4}$	22.00	21.00	20.50
$10\frac{1}{4}$	31.50	26.50	25.00
$12\frac{1}{4}$	33.50	28.50	28.50
$14\frac{1}{4}$	43.00	36.00	33.50
$16\frac{1}{4}$	46.00	39.00	38.00
$18\frac{1}{4}$	53.50	43.50	42.00
$20\frac{1}{4}$	56.00	46.00	46.00
$22\frac{1}{4}$	.....	115.00	66.00
$24\frac{1}{4}$	.....	125.00	88.00
$26\frac{1}{4}$	.....	150.00	.....
$28\frac{1}{4}$	.....	175.00	.....

"BOND" RIGID PILLOW, FLAT AND CLAMP BOXES

No. 19. Ring Oiling Pillow Block

**FIG. 1827**

No. 21. Wick Oiling Flat Box

**FIG. 1829**

No. 24. Clamp Box for Ordinary Work

**FIG. 1831**

No. 20. Wick Oiling Pillow Block

**FIG. 1828**

No. 22. Extra Heavy Rigid Pillow Block for Heavy Work

**FIG. 1830**

No. 25. Flat Box

**FIG. 1832**

Shaft Size, Inches	No. 19 Ring Oiling Pillow Block, Each	No. 20 Wick Oiling Pillow Block, Each	No. 21 Wick Oiling Flat Box, Each	Size Shaft, Inches	No. 22 Extra Heavy Rigid Pillow Block, Each	No. 24 Clamp Box, Each	No. 25 Flat Box, Each
$\frac{1}{8}$	\$3.50	....	1.30	...	....	....	....
$\frac{1}{4}$	3.75	1.80	1.50	$\frac{3}{4}$	....	....	.95
$\frac{1}{2}$	4.65	2.45	1.80	$\frac{1}{2}$	....	1.25	1.00
$\frac{3}{4}$	5.25	3.00	2.45	$\frac{3}{4}$	2.60	1.50	1.20
$1\frac{1}{8}$	6.00	4.00	3.40	$1\frac{1}{8}$	3.00	1.75	....
$1\frac{1}{2}$	7.00	5.25	4.95	$1\frac{1}{2}$	3.75	2.25	1.60
$2\frac{1}{8}$	8.00	6.25	5.75	$1\frac{3}{4}$	4.75	2.75	2.20
$2\frac{1}{2}$	9.25	7.75	7.40	$1\frac{3}{4}$	5.50	3.50	2.90
$2\frac{3}{4}$	10.40	9.75	8.75	$2\frac{1}{8}$	6.25	4.00	3.70
$3\frac{1}{8}$	12.00	12.25	....	$2\frac{3}{8}$	7.25	4.75	4.25
$3\frac{1}{2}$	15.00	14.50	....	$2\frac{1}{2}$	8.75	5.75	5.40
$3\frac{3}{4}$	18.00	16.00	....	$2\frac{3}{4}$	10.00	7.00	6.00
$4\frac{1}{8}$	22.00	18.00	....	$3\frac{1}{8}$	12.50	9.50	9.50
$4\frac{1}{2}$	26.50	....	....	$3\frac{1}{2}$	15.25	11.00	11.00
$4\frac{3}{4}$	30.00	....	....	$3\frac{3}{4}$	17.00	13.00	13.00
$5\frac{1}{8}$	35.00	....	....	$3\frac{1}{2}$	19.50	16.50	16.50
$5\frac{1}{2}$	40.00	....	....	$4\frac{1}{8}$	22.50	....	....
$5\frac{3}{4}$	53.00	....	....	$4\frac{1}{2}$	26.50	....	....
$5\frac{1}{2}$	73.00	....	....	$4\frac{3}{4}$	31.00	....	....
$6\frac{1}{8}$	112.00	....	....	$4\frac{1}{2}$	35.00	....	....

All Bearings Babbitted and Reamed.

"BOND" RIGID RING OILING POST BOX
BEARINGS BABBITTED AND REAMED

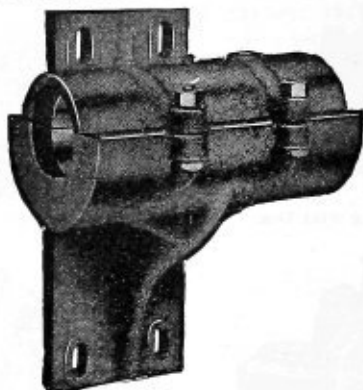


FIG. 1833

Shaft Size in.	1 $\frac{1}{8}$	1 $\frac{7}{8}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2 $\frac{1}{8}$	2 $\frac{7}{8}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	3 $\frac{1}{8}$	3 $\frac{7}{8}$	3 $\frac{1}{2}$
List Price..	\$4.00	5.00	5.75	6.75	8.50	10.00	13.00	15.00	18.50	22.00	31.50

"BOND" VERTICAL SHAFT CLAMP BOX
SPLIT BEARINGS, BABBITTED AND REAMED

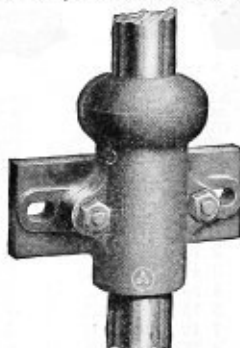


FIG. 1834

For upright shaft, babbitted and provided with grease or oil reservoir at top and arranged with parting cover to prevent accumulation of dirt or grit.

Shaft Size in.	1 $\frac{1}{8}$	1 $\frac{7}{8}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2 $\frac{1}{8}$	2 $\frac{7}{8}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	3 $\frac{1}{8}$	3 $\frac{7}{8}$	4 $\frac{1}{8}$
List Price..	\$3.00	3.25	3.75	5.00	6.25	7.50	9.00	11.25	16.00	22.00	27.50

**"BOND" PLAIN BASE PLATES
FOR PEDESTAL PILLOW BLOCKS**



FIG. 1835

We have a complete line of patterns for Rigid Ring Oiling Pillow Blocks and other types of Pillow Blocks, prices and dimensions furnished on application.

Shaft Size, Inches	List Price	Shaft Size, Inches	Price List
$1\frac{1}{8}$	\$3.50	...	.....
$1\frac{1}{4}$	4.25	$3\frac{7}{8}$	\$10.75
$1\frac{3}{8}$	4.25	$3\frac{1}{2}$	10.75
$1\frac{1}{2}$	5.00	$3\frac{1}{4}$	13.50
$1\frac{5}{8}$	5.00	$3\frac{3}{8}$	13.50
$2\frac{1}{8}$	5.75	$4\frac{1}{8}$	16.00
$2\frac{1}{4}$	5.75	$4\frac{1}{4}$	16.00
$2\frac{3}{8}$	7.50	$4\frac{3}{8}$	18.50
$2\frac{1}{2}$	7.50	$4\frac{1}{2}$	18.50

**"BOND" ADJUSTABLE BASE PLATE
FOR RIGID RING OILING PILLOW BLOCKS**

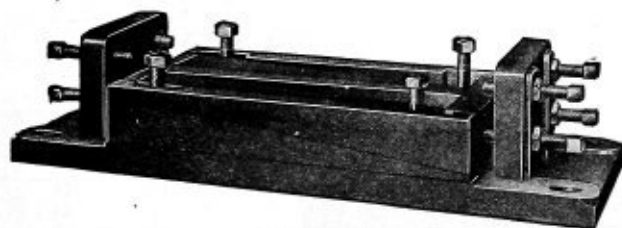


FIG. 1836

Price List of Adjustable Base Plate only. For list price of Rigid Ring Oiling Pillow Blocks see Page 693, No. 19.

Shaft Size, Inches	List Price	Shaft Size, Inches	Price List
$1\frac{1}{8}$ - $1\frac{1}{4}$	\$7.70	$4\frac{1}{4}$ - $4\frac{1}{2}$	\$49.00
$2\frac{1}{8}$ - $2\frac{1}{4}$	9.80	$5\frac{1}{8}$ - $5\frac{1}{4}$	55.00
$2\frac{3}{8}$ - $2\frac{1}{2}$	14.00	$5\frac{3}{8}$ - $5\frac{3}{4}$	60.00
$3\frac{1}{8}$ - $3\frac{1}{4}$	18.20	$6\frac{1}{8}$ - $6\frac{1}{4}$	75.00
$3\frac{3}{8}$ - $3\frac{1}{2}$	22.40	$7\frac{1}{8}$ - $7\frac{1}{4}$	90.00
$4\frac{1}{8}$ - $4\frac{1}{4}$	35.00		

"BOND" ADJUSTABLE FLOOR STANDS FOR LARGE SHAFTS

These Stands are constructed on lines to give the greatest strength and rigidity, having ample weight and area of base.

They are well adapted to heavy duty and high speed service.

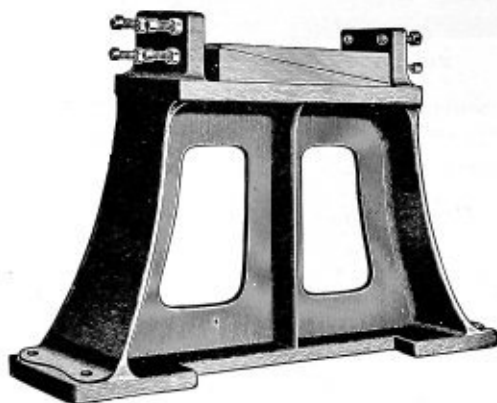


FIG. 1837

For Pillow Blocks, Inches	List Price	Center Shaft to Floor Line, Inches
3 $\frac{1}{8}$	\$67.50	24
to	70.00	30
3 $\frac{1}{2}$	77.50	36
4 $\frac{1}{8}$	85.00	30
to	95.00	36
4 $\frac{1}{2}$	105.00	42
5 $\frac{1}{8}$	145.00	30
to	158.00	36
5 $\frac{1}{2}$	169.00	42
6 $\frac{1}{8}$	210.00	30
to	220.00	36
7 $\frac{1}{8}$	240.00	42

Price for floor stand only,
pillow block is additional.

THE "BOND" WALL BRACKET

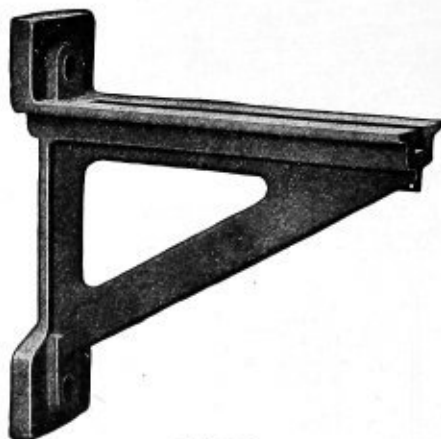


FIG. 1838

Pattern Symbol	Shaft Size, Inches	Extreme Length, Inches	List Price
A	1 $\frac{1}{8}$	18	\$8.00
"	to	24	9.00
"	1 $\frac{1}{2}$	30	10.00
B	1 $\frac{1}{8}$	18	9.00
"	to	24	10.00
"	2 $\frac{1}{8}$	30	12.00
"	2 $\frac{1}{2}$	36	15.00
B 1	2 $\frac{1}{8}$	24	12.00
"	to	30	15.00
"	3 $\frac{1}{8}$	36	25.00
C	3 $\frac{1}{8}$	24	18.00
"	to	30	25.00
"	3 $\frac{1}{2}$	36	35.00
D	3 $\frac{1}{8}$	36	40.00
"	4 $\frac{1}{8}$	42	48.00

"BOND" SOLID SAFETY SET COLLAR

Holscrew Type

Standard Type

**FIG. 1839****FIG. 1840****"BOND" SAFETY SPLIT COLLAR**

Holscrew Type

Standard Type

**FIG. 1841****FIG. 1842**

The collars are accurately machined all over. Standard type collars $1\frac{1}{4}$ inches and smaller furnished with headless set screws.

Shaft Size, Inches	List Price, Solid Type	List Price, Split Type	Shaft Size, Inches	List Price, Solid Type	List Price, Split Type	Shaft Size, Inches	List Price, Solid Type	List Price, Split Type	Shaft Size, Inches	List Price, Solid Type	List Price, Split Type
$\frac{3}{8}$	\$0.58	\$0.87	$1\frac{1}{8}$	\$1.40	\$2.10	$3\frac{1}{8}$	\$2.70	\$4.05	$4\frac{1}{8}$	\$4.85	\$7.28
$\frac{7}{8}$	.62	.93	2	1.45	2.17	$3\frac{1}{2}$	2.77	4.15	$4\frac{1}{2}$	5.15	7.56
1	.65	.97	$2\frac{1}{8}$	1.55	2.32	$3\frac{3}{8}$	2.92	4.38	$4\frac{3}{8}$	5.30	7.95
$1\frac{1}{8}$	.75	1.13	$2\frac{1}{4}$	1.60	2.40	$3\frac{1}{2}$	3.00	4.50	$4\frac{1}{4}$	5.45	8.18
$1\frac{1}{4}$	.80	1.20	$2\frac{3}{8}$	1.65	2.57	$3\frac{1}{2}$	3.08	4.62	$4\frac{3}{4}$	5.60	8.45
$1\frac{1}{2}$	.85	1.27	$2\frac{1}{2}$	1.75	2.63	$3\frac{3}{4}$	3.14	4.71	$4\frac{7}{8}$	5.75	8.62
$1\frac{3}{8}$	.90	1.35	$2\frac{3}{4}$	1.80	2.70	$3\frac{5}{8}$	3.22	4.83	$4\frac{7}{8}$	5.90	8.85
$1\frac{3}{4}$	.95	1.43	$2\frac{7}{8}$	1.88	2.82	$3\frac{7}{8}$	3.30	4.95	5	6.06	9.10
$1\frac{7}{8}$	1.00	1.50	$2\frac{5}{8}$	2.03	3.05	$3\frac{7}{8}$	3.37	5.05	$5\frac{1}{8}$	6.23	9.35
$1\frac{1}{2}$	1.05	1.57	$2\frac{9}{8}$	2.10	3.15	$3\frac{7}{8}$	3.45	5.18	$5\frac{1}{4}$	6.67	10.00
$1\frac{5}{8}$	1.10	1.65	$2\frac{3}{4}$	2.17	3.25	$3\frac{7}{8}$	3.52	5.28	$5\frac{1}{2}$	7.00	10.50
$1\frac{5}{8}$	1.15	1.72	$2\frac{7}{8}$	2.25	3.38	$3\frac{7}{8}$	3.60	5.40	$5\frac{1}{2}$	7.20	10.80
$1\frac{5}{8}$	1.20	1.80	$2\frac{7}{8}$	2.32	3.48	4	3.73	5.60	$5\frac{3}{8}$	7.50	11.25
$1\frac{3}{4}$	1.25	1.87	$2\frac{7}{8}$	2.40	3.60	$4\frac{1}{8}$	4.15	6.22	$5\frac{3}{8}$	8.00	12.00
$1\frac{5}{8}$	1.30	1.95	3	2.48	3.72	$4\frac{1}{4}$	4.28	6.42	$5\frac{3}{8}$	9.50	13.00
$1\frac{7}{8}$	1.35	2.03	$3\frac{1}{8}$	2.63	3.95	$4\frac{1}{2}$	4.70	7.05	6	9.00	14.00

"BOND" DOUBLE FLANGE SOLID SET COLLAR



FIG. 1843

In placing a Double Flange Collar on the market we have endeavored to give the trade a collar of good mechanical construction for which there is a popular demand.

PRICE LIST DOUBLE FLANGE SOLID SET COLLAR

Shaft Size, Inches	List Price	Shaft Size, Inches	List Price	Shaft Size, Inches	List Price	Shaft Size, Inches	List Price
1	\$0.65	2 $\frac{1}{8}$	\$1.55	3 $\frac{3}{8}$	\$2.92	4 $\frac{1}{2}$	\$5.30
1 $\frac{1}{8}$	.75	2 $\frac{3}{8}$	1.60	3 $\frac{7}{8}$	3.00	4 $\frac{3}{4}$	5.45
1 $\frac{1}{4}$	.80	2 $\frac{1}{2}$	1.65	3 $\frac{1}{2}$	3.08	4 $\frac{1}{2}$	5.60
1 $\frac{3}{8}$	.85	2 $\frac{3}{4}$	1.75	3 $\frac{5}{8}$	3.14	4 $\frac{7}{8}$	5.75
1 $\frac{1}{2}$	.90	2 $\frac{7}{8}$	1.80	3 $\frac{7}{8}$	3.22	4 $\frac{1}{2}$	5.90
1 $\frac{5}{8}$	.95	2 $\frac{1}{2}$	1.88	3 $\frac{1}{2}$	3.30	5	6.06
1 $\frac{7}{8}$	1.00	2 $\frac{3}{4}$	2.03	3 $\frac{3}{4}$	3.37	5 $\frac{1}{8}$	6.23
1 $\frac{1}{2}$	1.05	2 $\frac{1}{2}$	2.10	3 $\frac{1}{2}$	3.45	5 $\frac{3}{8}$	6.67
1 $\frac{3}{4}$	1.10	2 $\frac{3}{4}$	2.17	3 $\frac{3}{4}$	3.52	5 $\frac{1}{2}$	7.00
1 $\frac{5}{8}$	1.15	2 $\frac{1}{2}$	2.25	3 $\frac{1}{2}$	3.60	5 $\frac{1}{4}$	7.20
1 $\frac{1}{2}$	1.20	2 $\frac{3}{4}$	2.32	4	3.73	5 $\frac{3}{4}$	7.50
1 $\frac{3}{4}$	1.25	2 $\frac{1}{2}$	2.40	4 $\frac{1}{8}$	4.15	5 $\frac{7}{8}$	8.00
1 $\frac{1}{2}$	1.30	3	2.48	4 $\frac{1}{4}$	4.28	5 $\frac{1}{2}$	8.50
1 $\frac{3}{8}$	1.35	3 $\frac{1}{4}$	2.63	4 $\frac{3}{8}$	4.70	6	9.00
1 $\frac{1}{2}$	1.40	3 $\frac{3}{8}$	2.70	4 $\frac{1}{2}$	4.85	...	...
2	1.45	3 $\frac{1}{2}$	2.77	4 $\frac{3}{4}$	5.15	...	...

"BOND" SQUARE JAW CLUTCH COUPLING
FINISHED ALL OVER AND KEYS FURNISHED

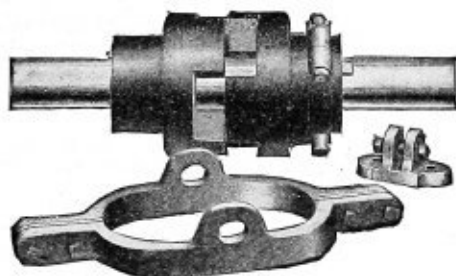


FIG. 1844

These couplings are finished all over. The jaws are accurately planed to prevent back lash and to insure equal bearing pressure on each.

When ordering couplings if shifter levers are required, same must be specified extra. For reducing couplings add 20 per cent to largest size.

Shaft Size, Inches	Price With-out Shifter Yoke and Fulcrum	Price With Shifter Yoke and Fulcrum	Shaft Size, Inches	Price With-out Shifter Yoke and Fulcrum	Price With Shifter Yoke and Fulcrum
1 $\frac{1}{8}$	\$13.00	\$16.00	3 $\frac{1}{8}$	\$34.00	\$44.00
1 $\frac{1}{4}$	14.00	17.50	3 $\frac{1}{4}$	38.00	48.00
1 $\frac{3}{8}$	15.00	20.00	3 $\frac{3}{8}$	45.00	60.00
1 $\frac{1}{2}$	16.00	21.00	3 $\frac{1}{2}$	50.00	65.00
2 $\frac{1}{8}$	17.00	23.00	4 $\frac{1}{8}$	65.00	80.00
2 $\frac{1}{4}$	19.00	26.00	4 $\frac{1}{4}$	85.00	105.00
2 $\frac{3}{8}$	22.00	29.00	5 $\frac{1}{8}$	100.00	120.00
2 $\frac{1}{2}$	28.00	37.00	5 $\frac{1}{4}$	120.00	140.00

"BOND" SOLID SLEEVE COUPLING

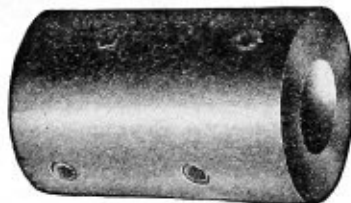


FIG. 1845

These Couplings are machine finished all over and can be made with either hollow set screws or recessed head set screws at the same price.

Unless otherwise specified Hollow Set Screws will be furnished.

Shaft Size, Inches	List Price	Length, Inches	Outside Diam., Inches
1 $\frac{1}{8}$	\$3.00	3 $\frac{3}{4}$	2 $\frac{1}{2}$
1 $\frac{1}{4}$	3.50	4 $\frac{1}{2}$	2 $\frac{7}{8}$
1 $\frac{3}{8}$	3.75	5 $\frac{1}{4}$	3 $\frac{1}{8}$
1 $\frac{1}{2}$	4.00	5 $\frac{1}{4}$	3 $\frac{3}{8}$
1 $\frac{3}{4}$	4.50	5 $\frac{3}{4}$	3 $\frac{1}{2}$
1 $\frac{7}{8}$	5.50	6 $\frac{3}{4}$	4

For reducing couplings add 20 per cent to the largest bore.

GRUNDY PATENT FLEXIBLE INSULATED COUPLINGS



FIG. 1846

While maintaining a positive and silent drive, it is free from objectionable hammer action features. It is perfectly balanced, and adapted for revolving at high speeds. It can be run in either direction; is close connected; easy of access; practically no repairs.

There are no loose cylinders, rings, threaded pins or bolts to give trouble.

In the matter of neatness and utility, it is an ideal con-

The Grundy Patent Flexible Insulated Coupling is constructed of three pieces only, the two outer flanges being of cast iron, and the center disc of non-conducting material, with lugs on each side of same, as a medium for transmitting the power from one flange to the other.

It is a simple and effective device for connecting the two ends of shafting where it is difficult to get the bearings in perfect alignment, or where they are liable to get out of adjustment.

The driving disc being made of non-conducting material, acts as a thorough insulator.

The coupling being made of only three pieces, there are no complicated parts to get out of order.

It can be either set-screwed, key-seated, or both.

It is a safety coupling, there being no projections to cause danger.

In appearance, it is very similar to the ordinary plate coupling.

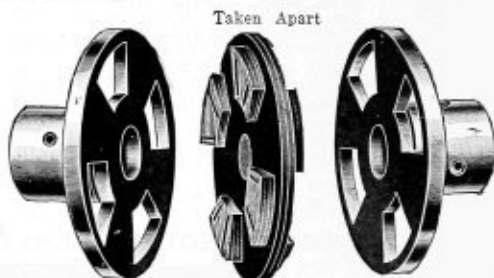


FIG. 1847

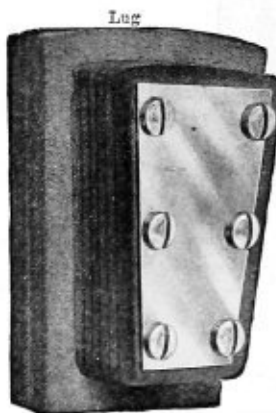


FIG. 1848

nection for use between dynamo and gas engine cranks or similar machinery. It can be used to advantage for connecting motors to pumps, sewing machines, machine tools, wood-working machinery, printing machinery, shafting to angle drives, etc., etc.

The central disc is made of specially selected leather or hard fibre, with lugs securely cemented and riveted to each side of same. On the larger sizes (No. 12 to No. 30, inclusive) the lugs are bolted on, and re-enforced with steel plate, as shown on figure C. The disc supplies the insulation, while the lugs on each side of same transmit the power from one outside flange to the other.

The leather lugs are cut on a bias, narrowing towards the disc, the cast iron driving flanges being machined with a corresponding taper. This has a tendency to draw the flanges close to the disc, and to cause the leather lugs to receive and transmit the power at their strongest points.

The illustration at the left shows one of the lugs on a No. 30 Grundy Coupling Disc. The method of securely fastening with bolts, steel plate and cement is clearly shown.

GRUNDY PATENT FLEXIBLE INSULATED COUPLINGS CONTINUED

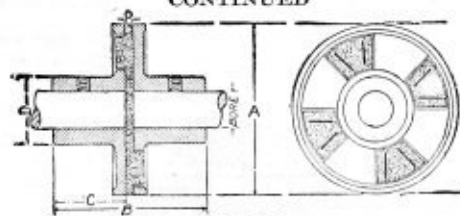


FIG. 1849

No.	Dimensions, Inches					H. P. at 100 R. P. M.	No. of Lugs	Max. Bore Inches	Approx. Weight Pounds	Price Each
	A	*B	C	D	P					
3	3	....	1 3/4	1 1/8	1/4	3 1/4	3	5/8	1 3/4	\$ 7.00
4	4	....	2	1 1/8	1/4	1 1/2	4	1	5	8.40
5	5	....	2 1/2	2 3/8	1/4	3	4	1 1/4	8	10.00
6	6	....	2 3/4	3	1/4	5	4	1 5/8	12	15.20
7	7	....	3 1/8	3 1/8	3/8	8	4	1 3/4	15	20.00
8	8	....	3 1/4	3 3/4	3/8	13	4	2 1/8	25	26.00
9	9	....	3 1/2	4 1/8	3/8	16	4	2 1/4	35	32.00
10 1/2	10 1/2	....	4	5 1/8	1/2	35	6	2 3/4	50	50.00
12	12	....	6	6 1/4	1 1/2	55	7	3	100	65.00
14	14	....	7	8	1	70	8	4	150	90.00
16	16	....	7 1/2	9 1/2	1 1/8	95	9	5	285	135.00
18	18	....	8	10 3/4	1 3/8	125	10	6	350	160.00
21	21	....	9	13	1 1/4	180	12	7	575	245.00
24	24	....	9	14 1/2	3/4	270	12	8	750	300.00
30	30	....	10	19	7/8	500	16	11	1500	450.00

*For standard sizes, the dimensions of B are twice C plus P, but the length of hubs can be changed to suit conditions.

Prices are f. o. b. factory, and include bores (no extra charge for reducing), key-seated, set-screwed, or both, as may be ordered. The dimensions as given are standard, but slight variations can be made at very little additional expense, when necessary for special conditions. Dimensions of hubs, as given in the list, are the standard sizes but can be made to conform to specifications of the purchaser, for which there will be an additional charge.

When small horse-power and large bores are required, couplings from No. 4 to No. 12, inclusive, can be made with larger hubs, but are furnished only when we are familiar with the details. For this extra labor and material, we add 10 per cent to the net price of the coupling.

Horse-power, as shown in the list, is for steady load, and not for intermittent or bump loads. When Grundy Couplings are to be used with gas engines, air compressors, A. C. electric motors, etc., it is advisable to get our recommendations.

When asking for prices, or ordering, give the following information:

Horse-power required.....
 Revolutions per minute.....
 Diameter of driving shaft.....
 Diameter of receiving shaft.....
 Are couplings to be key-seated?.....
 Set-screwed?.....Or both?.....
 Size of key seats.....
 Are conditions, under which the coupling is to work, dry
 or subject to moisture?.....
 Is load constant?.....
 Is load intermittent?.....

THE "BOND" PLATE COUPLING WITH TIGHT FITTING BOLTS AND KEYS

These couplings are bored for driving fit, key-seated and keys furnished; they have finished bolts fitted to reamed holes.

At a slight extra cost we will furnish our special Male and Female type which is made by projecting a section of the flange of one-half into a recess in the other, outside of the bolt circle, thus assuring perfect alignment.

For reducing couplings add 20 per cent to largest bore.



FIG. 1850

Shaft Size, Inches	List Price of Coupling	Price of Coupling Fitted to Shaft	Size of Keys, Inches	Shaft Size, Inches	List Price of Coupling	Price of Coupling Fitted to Shaft	Size of Keys, Inches
1 $\frac{1}{8}$	\$ 8.00	\$12.00	$\frac{1}{8}$	3 $\frac{1}{8}$	\$28.50	\$36.00	$\frac{3}{8}$
1 $\frac{1}{4}$	9.00	13.00	$\frac{3}{8}$	3 $\frac{1}{4}$	33.50	42.00	$\frac{7}{8}$
1 $\frac{3}{8}$	10.50	14.50	$\frac{1}{2}$	3 $\frac{3}{8}$	36.00	45.00	1
1 $\frac{1}{2}$	11.50	15.50	$\frac{3}{4}$	4 $\frac{1}{8}$	49.00	58.00	1
2 $\frac{1}{8}$	13.00	17.50	$\frac{1}{2}$	4 $\frac{1}{4}$	63.00	72.00	1 $\frac{1}{8}$
2 $\frac{1}{4}$	14.50	19.50	$\frac{5}{8}$	4 $\frac{3}{8}$	68.00	78.00	1 $\frac{1}{4}$
2 $\frac{3}{8}$	17.50	23.00	1	4 $\frac{1}{2}$	75.00	88.00	1 $\frac{3}{8}$
2 $\frac{1}{2}$	21.50	27.50	$\frac{3}{4}$	5 $\frac{1}{8}$	88.00	102.00	1 $\frac{1}{2}$
3 $\frac{1}{8}$	26.00	34.00	$\frac{3}{4}$	5 $\frac{1}{4}$	103.00	120.00	1 $\frac{3}{4}$

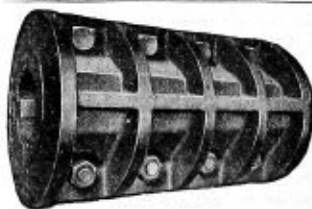


FIG. 1851

THE "BOND" CLAMP COUPLING WITH KEYS

For reducing couplings, add 20 per cent to largest bore.

Wrenches for these couplings up to 3 $\frac{1}{8}$ in. size furnished, if desired, at a small extra cost.

Shaft Size, Inches	List Price	Size of Keys, Inches	Shaft Size, Inches	List Price	Size of Keys, Inches
$\frac{1}{8}$	\$4.50	$\frac{1}{8}$	2 $\frac{1}{8}$	\$15.00	$\frac{3}{8}$
1 $\frac{1}{8}$	5.00	$\frac{1}{4}$	3 $\frac{1}{8}$	19.00	$\frac{3}{8}$
1 $\frac{1}{4}$	6.00	$\frac{3}{8}$	3 $\frac{1}{4}$	21.50	$\frac{7}{8}$
1 $\frac{3}{8}$	7.00	$\frac{1}{2}$	3 $\frac{3}{8}$	24.50	$\frac{7}{8}$
1 $\frac{1}{2}$	8.50	$\frac{1}{2}$	3 $\frac{1}{2}$	28.00	1
2 $\frac{1}{8}$	10.00	$\frac{1}{2}$	4 $\frac{1}{8}$	33.00	1
2 $\frac{1}{4}$	11.00	$\frac{5}{8}$	4 $\frac{1}{4}$	38.00	1 $\frac{1}{8}$
2 $\frac{3}{8}$	12.50	1	4 $\frac{3}{8}$	43.00	1 $\frac{1}{4}$
			4 $\frac{1}{2}$	48.00	1 $\frac{3}{8}$

THE "BOND" PATENT "SPIRO" COMPRESSION COUPLING

DOUBLE-SURE GRIP ON SHAFT



FIG. 1852

Fifty per cent more gripping power than any other compression coupling on the market.

SINGLE FLANGE PRICE LIST

Shaft Size, Inches	List Price	Shaft Size, Inches	List Price
$\frac{3}{4}$	\$3.50	$1\frac{1}{2}$	\$8.00
$\frac{1}{2}$	4.00	$2\frac{1}{2}$	9.00
$1\frac{1}{8}$	4.75	$2\frac{3}{4}$	10.75
$1\frac{1}{4}$	5.00	$2\frac{1}{2}$	13.00
$1\frac{3}{8}$	5.50	$2\frac{3}{4}$	16.00
$1\frac{1}{2}$	6.25		

The spiral slot in sleeve makes the Bond a perfect compression coupling giving a "double-sure" grip the entire length and circumference of the sleeve. A trial order will convince you of its superiority.



FIG. 1853

KEYSEATING AND KEYS A THING OF THE PAST
DOUBLE FLANGE PRICE LIST

Double compression couplings are constructed with four flanges. Two of the flanges and hub of half the coupling cast in one piece, using long and short bolts alternately for bolting together.

Shaft Size, Inches	List Price	Shaft Size, Inches	List Price
$2\frac{1}{2}$	\$27.25	$3\frac{1}{2}$	\$51.25
$3\frac{1}{8}$	32.50	$4\frac{1}{8}$	71.75
$3\frac{3}{8}$	39.25	$4\frac{1}{2}$	94.00
$3\frac{1}{2}$	45.25		

For reducing couplings, add 20 per cent to largest bore.

ALMOND RIGHT ANGLE TRANSMISSION

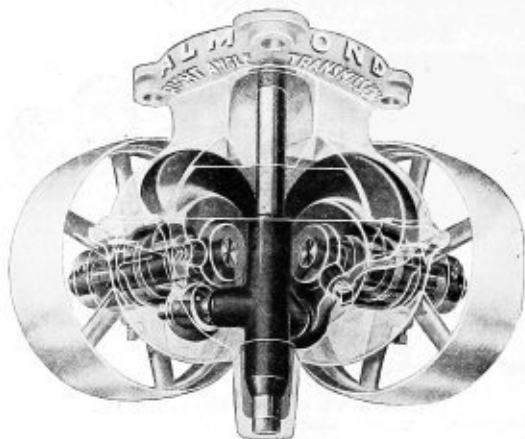


FIG. 1854

Transmits power at right angles with no more attention than renewing oil monthly.

Self-contained, noiseless. Does not throw or spill oil. No gears.

Built in three sizes. Meets all requirements of right angle driving up to the transmitting capacity of a nine-inch belt running on a twenty-inch pulley under the proper condition to insure belt economy.

Each size is designed to transmit a certain torque or twisting strain at any speed up to the maximum (see table of specifications). Any decrease in speed from the maximum causes a corresponding decrease in its capacity to transmit power. If an attempt is made to transmit the maximum power at a lower speed than the maximum, then a correspondingly greater strain is put upon the internal mechanism than that for which it is designed, with more or less disastrous results.

The different sizes of transmission can invariably be installed to run at their proper speeds by providing pulleys of the right sizes on the driving line, standard sizes being furnished with the transmission. Likewise any desired speed can be obtained on the driven line by providing a suitable pulley.

**RIGHT ANGLE COUNTERSHAFT LIST AND SPECIFICATIONS
WHICH INCLUDE TWO PULLEYS**

	Shaft Diameter	Maximum Speed	Size of Pulleys	H. P.	Weight	Drop to Center of Shaft	Price List
No. 1.....	1 $\frac{1}{8}$ in.	500 rev.	12x4	5	160 lbs.	7 $\frac{1}{2}$ in.	\$70.00
No. 2.....	1 $\frac{3}{8}$ in.	400 rev.	16x6	10	320 lbs.	9 in.	105.00
No. 3.....	1 $\frac{7}{8}$ in.	350 rev.	20x9	20	650 lbs.	13 in.	210.00

Coupling is guaranteed when such pulleys and speeds are used as those given above, but not if larger pulleys or increased speeds are used.

When transmission is to be direct connected the shaft is made to extend six inches outside of sleeve and compression shafting coupling supplied in place of pulley.

CLASS B BELT TIGHTENER IRON FRAME

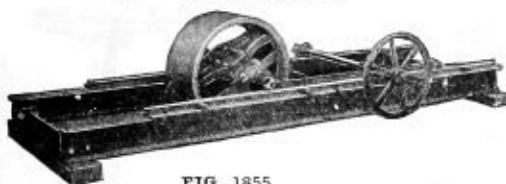


FIG. 1855

Furnished with either standard or self-oiling bearings and iron center wood rim, all wood or all iron pulley. Has rack and pinion adjustment. Hand-wheel can be placed on either side. I-beam base.

Number	Pulley	Length of Adjustment, Inches	Price
00—B	Diam. Face 12 x 9	18	\$78.00
0—B	18 x 12	20	110.00
1—B	24 x 14	24	150.00
2—B	28 x 20	42	250.00
3—B	36 x 28	48	400.00
4—B	42 x 38	60	520.00

CLASS C BELT TIGHTENER IRON FRAME

Furnished with either standard or self-oiling bearings and iron center wood rim, all wood or all iron pulley. Has rack and pinion adjustment. Hand-wheel can be placed on either side. To be supported between timbers.

Number	Pulley	Adjustment, Inches	Price
00—C	Diam. Face 12 x 9	18	\$62.50
0—C	18 x 12	20	87.50
1—C	24 x 14	24	120.00
2—C	28 x 20	42	200.00
3—C	36 x 28	48	320.00
4—C	42 x 38	60	415.00

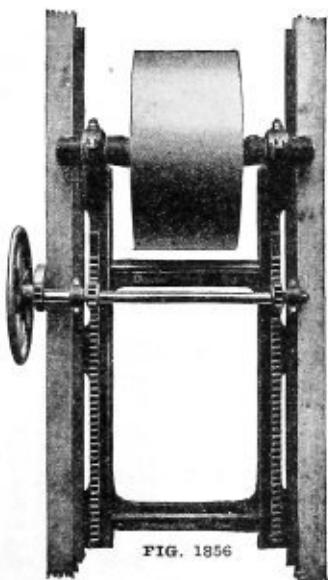


FIG. 1856

"BOND" MULE STANDS

Stationary Type



FIG. 1857

Adjustable Type



FIG. 1858

STATIONARY TYPE

Width of Belt Inches	Pulleys	Length of Standard Feet	Length of Guy Rods		List Price
			Ft.	In.	
2	Diam. Face				
	10x 3	3	5	6	\$30.00
2	10x 4	3	5	6	35.00
4	10x 5	4	5	6	37.50
5	12x 6	5	7	0	40.00
6	14x 7	5	7	0	55.00
7	14x 8	5	7	0	60.00
8	16x 9	6	8	6	65.00
10	18x12	6	8	6	85.00
12	20x14	6	8	6	97.50

ADJUSTABLE TYPE

	Diam. Face		Ft.		In.	
3	10x 4	3	5	6		\$50.00
4	10x 5	4	5	6		55.00
5	12x 6	5	7	0		60.00
6	14x 7	5	7	0		66.00
7	14x 8	5	7	0		70.00
8	16x 9	6	8	6		78.00
9	16x10	6	8	6		90.00
10	18x12	6	8	6		100.00
12	20x14	6	8	6		125.00
14	24x16	6	8	6		145.00

Furnished complete with ceiling plate, guy rods, tension turnbuckles and all necessary pulleys.

"BESTOVALL" FLINT PAPER

Sheets 9x11, Half Ream Packages.

Grit Nos.	Per Ream	Grit Nos.	Per Ream
40 to ½	\$7.00	2½	\$9.00
1	7.50	3	10.50
1½	8.00	3½	11.75
2	8.50	Assorted	8.00

480 Sheets to Ream

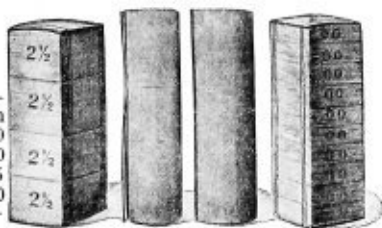


FIG. 1859

"BESTOVALL" FLINT PAPER Per Roll 50 Yards Long

Grit Nos.	½	1	1½	2	2½	3	3½
Rolls—							
2½ in.	\$1.35	1.40	1.45	1.50	1.55	1.75	1.85
3½ in.	1.55	1.65	1.75	1.80	1.90	2.10	2.25
4 in.	1.75	1.85	1.90	2.05	2.15	2.40	2.60
6 in.	2.45	2.60	2.75	3.00	3.20	3.50	3.80
8 in.	3.10	3.30	3.60	3.80	3.95	4.45	4.90
9 in.	3.80	3.90	4.10	4.20	4.40	4.80	5.30
10 in.	3.95	4.20	4.40	4.55	4.90	5.30	6.00
12 in.	4.50	4.85	5.15	5.45	5.80	6.50	7.20
15 in.	5.80	6.10	6.50	6.80	7.15	7.80	8.80
18 in.	7.15	7.45	7.80	8.15	8.45	9.10	10.20
20 in.	7.60	8.10	8.60	9.20	9.80	10.75	11.90
24 in.	8.00	8.75	9.25	10.25	11.00	12.25	13.50
30 in.	10.75	11.50	12.00	12.50	13.25	14.50	16.75
36 in.	13.25	13.75	14.50	15.00	16.00	17.00	19.75
40 in.	16.00	16.50	17.00	17.75	18.50	20.00	22.75
42 in.	17.00	17.75	18.25	19.00	19.75	21.50	24.00
48 in.	19.75	21.50	22.25	23.00	24.00	26.50	30.50

Intermediate sizes charged at next higher list.

"BESTOVALL" EMERY CLOTH

Sheets 9x11, Quire and Quarter Ream Packages.

Crocus	\$31.00	No. 0	\$31.00	No. 2	\$38.00
No. FF	31.00	No. 100	31.00	No. 2½	41.00
No. F	31.00	No. ½	31.00	No. 3	44.00
No. 000	31.00	No. 1	33.00	No. 3½	47.00
No. 00	31.00	No. 1½	35.00	No. 4	50.00

"BESTOVALL" EMERY CLOTH

Grit Nos.	½	1	1½	2	2½	3	3½	4
Rolls—								
3 in.	\$4.10	4.35	4.60	4.95	5.30	5.65	6.00	6.35
3½ in.	4.85	5.00	5.30	5.70	6.10	6.50	6.90	7.35
4 in.	5.30	5.65	6.00	6.40	6.90	7.40	7.85	8.30
5 in.	6.50	6.90	7.45	7.90	8.50	9.10	9.65	10.25
6 in.	7.70	8.20	8.75	9.35	10.10	10.80	11.50	12.20
7 in.	8.90	9.50	10.10	10.85	11.70	12.55	13.35	14.15
8 in.	10.10	10.75	11.50	12.35	13.30	14.25	15.15	16.10
9 in.	11.50	12.00	13.00	14.00	15.00	16.00	17.00	18.00
10 in.	12.50	13.30	14.20	15.30	16.50	17.70	18.85	20.00
12 in.	14.90	15.85	16.95	18.15	19.70	21.15	22.50	23.90
14 in.	17.30	18.40	19.70	21.25	22.90	24.60	26.15	27.80
16 in.	19.75	20.90	21.90	24.20	26.10	28.00	29.85	31.70
18 in.	22.25	23.50	25.25	27.25	29.25	31.50	33.50	35.50
20 in.	24.50	26.10	27.90	30.10	32.50	34.90	37.15	39.50
24 in.	29.30	31.20	33.40	35.80	38.90	41.80	44.50	47.30
27 in.	32.50	34.50	37.00	40.00	43.00	46.50	49.50	52.50

Rolls 50 Yards Long.

"BESTOVALL" EMERY PAPER

Sheets 9x11. Half Ream Packages. 480 Sheets to Ream.

No. 000	per ream	\$12.50	No. 2	per ream	\$16.75
No. 00	per ream	12.50	No. 2½	per ream	18.50
No. 0	per ream	12.50	No. 3	per ream	22.75
No. ½	per ream	12.50	No. 3½	per ream	26.50
No. 1	per ream	13.75	No. 4	per ream	30.50
No. 1½	per ream	15.00			

"BESTOVALL" EMERY PAPER—IN ROLLS

Per Roll 50 Yards Long.

Width	Nos. FF-90 FF to ½	No. 80 1	No. 70 1½	No. 60 2	No. 46 2½	No. 36 3	No. 24 3½	No. 16 4
2 in.	\$ 1.50	1.70	1.80	1.90	2.15	2.55	2.90	3.25
3 in.	2.00	2.25	2.40	2.60	2.90	3.50	3.90	4.40
3½ in.	2.35	2.55	2.80	2.95	3.40	4.00	4.50	5.00
4 in.	2.60	2.90	3.10	3.35	3.75	4.50	5.00	5.65
6 in.	3.70	4.20	4.40	4.75	5.40	6.70	7.40	8.30
8 in.	4.95	5.45	5.80	6.30	7.10	8.65	9.80	11.10
9 in.	5.45	6.20	6.45	7.00	7.95	9.70	10.95	12.85
10 in.	6.00	6.70	7.10	7.70	8.70	10.65	12.15	13.70
12 in.	7.00	7.95	8.40	9.10	10.30	12.70	14.40	16.25
15 in.	8.95	10.10	10.70	11.55	13.15	16.10	18.20	20.55
16 in.	9.55	10.70	11.35	12.25	13.95	17.10	19.30	21.80
18 in.	10.60	11.95	12.65	13.65	15.55	19.10	21.65	24.40
20 in.	11.70	13.15	13.95	15.05	17.10	21.10	23.95	27.10
24 in.	12.75	14.75	15.75	17.00	19.50	24.00	27.50	31.00

THREE-M-ITE CLOTH

Grit Nos.	Reams 9x11	Rolls 50 Yards Long		
		9	18	27
000—180	\$31.00	11.50	22.25	32.50
00—150	31.00	11.50	22.25	32.50
0—120	31.00	11.50	22.25	32.50
100—100	31.00	11.50	22.25	32.50
½—90	31.00	11.50	22.25	32.50
1—80	33.00	12.00	23.50	34.50
1½—70	35.00	13.00	25.25	37.00
2—60	38.00	14.00	27.25	40.00
2½—46	41.00	15.00	29.25	43.00
3—36	44.00	16.00	31.50	46.50
3½—24	47.00	17.00	33.50	49.50
4—16	50.00	18.00	35.50	52.50

480 sheets to ream, 24 sheets to quire.

Packed in quire and quarter-ream packages.

THREE-M-ITE CLOTH

Heavy Coated for Belts. Rolls 50 Yards Long.

Grit Nos.	3-0 to ½	1	1½	2	2½	3	3½	4
Rolls								
4 in.	\$5.80	6.20	6.60	7.00	7.60	7.70	8.60	9.00
6 in.	8.45	9.00	9.60	10.25	11.00	12.00	12.50	13.40
9 in.	12.65	13.20	14.30	15.40	16.50	17.50	18.50	19.75
14 in.	19.00	20.25	21.75	23.25	25.00	27.00	28.75	30.50
18 in.	24.50	25.85	27.75	30.00	32.00	34.50	36.75	39.00
20 in.	27.00	28.75	30.70	33.00	35.75	38.50	40.75	43.50

Intermediate sizes charged at next higher list.

SUPERIOR GARNET PAPER

Per Roll, 50 Yards Long.

Grit Nos.	000 to $\frac{1}{2}$	1	1½	2	2½	3	3½
Rolls							
2½ in.	\$1.25	1.30	1.35	1.45	1.60	1.65	1.70
3½ in.	1.40	1.50	1.55	1.60	1.75	2.00	2.10
4 in.	1.60	1.70	1.75	1.90	2.10	2.30	2.40
5 in.	1.75	1.85	1.90	2.05	2.35	2.55	2.85
6 in.	2.25	2.35	2.45	2.60	2.95	3.25	3.55
8 in.	2.95	3.10	3.25	3.50	3.90	4.30	4.70
9 in.	3.40	3.65	3.80	4.00	4.45	4.65	4.95
10 in.	3.75	4.00	4.15	4.45	4.95	5.30	5.75
12 in.	4.35	4.60	4.70	5.15	5.85	6.30	6.85
15 in.	5.55	6.00	6.30	6.75	7.40	7.95	8.65
18 in.	6.60	7.15	7.40	7.85	8.60	9.10	9.75
20 in.	7.80	8.35	8.65	9.10	10.00	10.50	11.25
24 in.	8.00	8.50	8.75	9.50	11.00	12.00	13.25
30 in.	10.75	11.25	11.75	12.50	13.50	15.00	17.00
36 in.	13.00	13.75	14.25	14.75	16.00	17.50	19.00
40 in.	15.50	16.00	16.75	17.50	18.50	20.00	22.00
42 in.	16.75	17.25	18.00	18.75	19.75	21.00	24.00
48 in.	19.00	20.00	21.00	22.00	23.00	26.00	31.00

Intermediate sizes charged at next higher list.

SUPERIOR GARNET CLOTH

Per Roll of 50 Yards.

Grit Nos.	000 to $\frac{1}{2}$	1	1½	2	2½	3
Rolls						
2½ in.	\$2.90	3.10	3.20	3.25	3.35	3.45
3½ in.	3.80	4.00	4.10	4.25	4.40	4.55
4 in.	4.20	4.55	4.70	4.90	5.00	5.15
5 in.	5.80	6.25	6.50	6.70	6.90	7.15
6 in.	6.45	7.25	7.70	7.95	8.30	8.55
7 in.	7.25	7.80	8.05	8.30	8.60	8.85
8 in.	8.40	9.00	9.35	9.60	9.95	10.25
9 in.	9.35	10.00	10.35	10.75	11.00	11.50
10 in.	11.60	12.50	13.00	13.40	13.80	14.30
12 in.	12.75	13.65	14.20	14.55	15.10	15.50
14 in.	14.00	15.00	15.50	16.00	16.50	17.00
16 in.	16.80	18.00	18.70	19.20	19.90	20.50
18 in.	18.20	19.55	20.20	20.90	21.50	22.15
20 in.	20.00	21.00	21.50	22.00	22.50	23.00
24 in.	25.20	27.00	28.05	28.80	29.85	30.75
28 in.	28.00	30.00	31.00	32.00	33.00	34.00

Intermediate sizes charged next higher list.

Made in three weights of backing: Light (jeans), Medium (drills), and extra heavy. Extra heavy at higher discount.

SUPERIOR GARNET CABINET PAPER

Sheets 9x11. Half Ream Packages.

Grit Nos.	Per Ream	Grit Nos.	Per Ream
000	\$7.00	1½	\$8.25
00	7.00	2	9.00
0	7.00	2½	10.00
½	7.00	3	11.00
1	7.50	3½	12.50

480 Sheets to the Ream.

THREE-M-ITE CLOTH



FIG. 1860

IN UTILITY ROLLS
25 YARDSIN UTILITY ROLLS
50 YARDS

Grit Nos.	Width						Width					
	1/2"	3/4"	1"	1 1/2"	2"	2 1/2"	1/2"	3/4"	1"	1 1/2"	2"	2 1/2"
1/2 and finer.....	\$0.65	.85	.95	1.25	1.55	1.85	\$1.10	1.50	1.70	2.30	2.90	3.55
1 -80	.70	.90	1.00	1.35	1.70	2.05	1.15	1.55	1.80	2.45	3.05	3.70
1 1/2-70	.75	.95	1.05	1.45	1.85	2.25	1.20	1.60	1.90	2.55	3.25	3.95
2 -60	.80	1.00	1.10	1.50	1.90	2.30	1.25	1.65	2.00	2.70	3.45	4.20
2 1/2-46	.85	1.05	1.15	1.55	1.95	2.35	1.30	1.70	2.10	2.90	3.70	4.50
3 -36	.90	1.10	1.20	1.65	2.10	2.55	1.35	1.80	2.20	3.10	3.95	4.80
3 1/2-24	.95	1.15	1.30	1.75	2.20	2.75	1.40	1.90	2.35	3.25	4.15	5.10

THREE-M-ITE CLOTH DISCS

IN "R" OR REGULAR WEIGHT, EACH

	FF-90	80	70	60	46	36	24	16	12	8
4 inch.....	\$0.05	.05	.05	.05	.06	.08	.09	.10	.14	.17
5 inch.....	.06	.06	.06	.06	.08	.09	.10	.13	.15	.18
6 inch.....	.09	.10	.10	.10	.13	.14	.15	.17	.20	.23
8 inch.....	.10	.12	.13	.13	.14	.15	.17	.20	.23	.25
10 inch.....	.14	.14	.15	.17	.18	.19	.22	.24	.29	.33
12 inch.....	.18	.22	.24	.25	.29	.30	.33	.35	.40	.45
14 inch.....	.22	.23	.25	.28	.30	.33	.38	.45	.50	.55
15 inch.....	.29	.30	.33	.35	.38	.40	.45	.47	.55	.60
16 inch.....	.33	.34	.35	.38	.40	.43	.47	.52	.62	.68
18 inch.....	.37	.38	.39	.40	.43	.47	.54	.63	.77	.98
20 inch.....	.52	.54	.58	.62	.67	.69	.74	.89	1.05	1.23
22 inch.....	.65	.70	.77	.83	.89	.93	.99	1.20	1.35	1.55
23 inch.....	.68	.74	.80	.85	.92	.98	1.04	1.23	1.42	1.60
24 inch.....	.70	.77	.83	.89	.93	.99	1.05	1.29	1.48	1.65
25 inch.....	.74	.80	.85	.92	.98	1.04	1.12	1.35	1.52	1.70
26 inch.....	.77	.83	.89	.93	.99	1.05	1.18	1.42	1.58	1.75
27 inch.....	.78	.84	.90	.97	1.04	1.10	1.20	1.45	1.64	1.83
30 inch.....	.99	1.05	1.12	1.23	1.29	1.35	1.52	1.82	2.10	2.30
40 inch.....	2.04	2.17	2.28	2.47	2.64	2.77	2.94	3.54	4.20	4.93
48 inch.....	2.83	3.07	3.30	3.54	3.73	3.97	4.20	5.17	5.88	6.60
53 inch.....	3.13	3.37	3.60	3.84	4.14	4.38	4.80	5.83	6.54	7.33

Always mention diameter of hole desired.

EMERY

	Grain		Flour F. F. F. and F. F. F.
	Nos. 4 to 46 Inclusive	Nos. 54 to 180 Inclusive	
In kegs of about 350 pounds...per pound	\$0.10	.11	.07
$\frac{1}{2}$ kegs of about 175 pounds...per pound	.10 $\frac{1}{2}$	.11 $\frac{1}{2}$	.07 $\frac{1}{2}$
$\frac{1}{4}$ kegs of about 75 pounds...per pound	.11	.12	.08

TRIPOLI COMPOSITION

Tripoli Composition is especially adapted for cutting down and polishing brass, bronze, britannia, and other metals preparatory to plating.

Standard Tripoli Composition, O. S., for cutting and polishing.....per pound	.....
Standard Tripoli Composition, M., very greasy.....per pound	.....
Standard Tripoli Composition, No. 6, hard and fast cutting.....per pound	.....
Standard Tripoli Composition, H., very fast cutting.....per pound	.....
Standard Tripoli Composition, No. 9, similar to O. S., slightly sharper.....per pound	.....

COTTON FLANNEL, MUSLIN AND
WOOLEN CLOTH BUFFS

STITCHED OR QUILTED

Muslin Buffs			Cotton Flannel		
Pieces Thick	Dia- meter	Per Dozen	Pieces Thick	Dia- meter	Per Dozen
30.....	2 inch	\$ 1.25	25.....	2 inch	\$ 1.25
30.....	2 $\frac{1}{2}$ "	1.50	30.....	2 $\frac{1}{2}$ "	1.50
35.....	3 "	1.75	30.....	3 "	2.00
42.....	4 "	2.00	30.....	4 "	2.25
50.....	6 "	3.50	30.....	6 "	4.25
55.....	8 "	6.00	30.....	8 "	7.00
60.....	9 "	7.50	30.....	9 "	9.00
65.....	10 "	10.00	35.....	10 "	12.00
70.....	12 "	12.00	40.....	12 "	15.00
70.....	14 "	21.00	40.....	14 "	22.00

Woolen Cloth Buffs, same price and thickness as Cotton Flannel Buffs

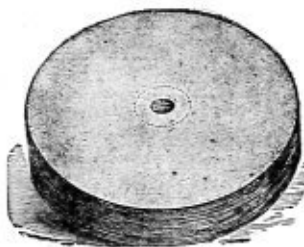


FIG. 1861

INDIA OIL STONES

India stones will do the work in half the time required for ordinary stones and will leave a keen, smooth edge.

Furnished in three grits—Fine, Medium and Coarse.

FINE is for fast cutting and close grained. For high class work.

MEDIUM, for ordinary tools and everyday work.

COARSE, gives surprising results where speed is considered before the finish.

No. 0—8x2x1	price, each	\$1.25
No. 9—4x $\frac{1}{4}$ x $\frac{1}{4}$	price, each	.45
No. 21—Gouge Slip, 6x2x1x $\frac{1}{2}$ x $\frac{1}{4}$	price, each	1.00
No. 22—4 $\frac{1}{2}$ x2 $\frac{1}{2}$ x $\frac{1}{2}$ x $\frac{1}{4}$	price, each	.60

No. 21, fine grade only.



FIG. 1862

COMBINATION STONE

No. 0—8x2x1.....each, \$1.50

These stones have one face fine and the other coarse grade.

STERLING CORUNDUM WHEELS



FIG. 1863

- In ordering, state
1. Quantity required.
 2. Diameter of wheels.
 3. Thickness of wheels.
 4. Size of arbor hole.
 5. Degree of coarseness, i. e., size or number of grain.
 6. Degree of hardness, i. e., grade letter.
 7. Description of work intended for the wheel.
 8. Speed of wheel, i. e., number of revolutions of spindle on which wheel will be run.

Price List--Straight Wheels

Diameter Inches	Thickness of Wheel in Inches																Diameter Inches	Price per Wheel
	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8	2		
1	\$.40	\$.50	\$.60	\$.70	\$.80	\$.90	\$ 1.00	\$ 1.10	\$ 1.20	\$ 1.30	\$ 1.40	\$ 1.50	\$ 1.60	\$ 1.70	\$ 1.80	\$ 1.90	1	\$ 1.00
2	.60	.80	1.00	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80	3.00	3.20	3.40	3.60	2	\$ 2.00
3	.80	1.10	1.40	1.70	2.00	2.30	2.60	2.90	3.20	3.50	3.80	4.10	4.40	4.70	5.00	5.30	3	\$ 3.00
4	1.10	1.40	1.70	2.00	2.30	2.60	2.90	3.20	3.50	3.80	4.10	4.40	4.70	5.00	5.30	5.60	4	\$ 4.00
5	1.40	1.70	2.00	2.30	2.60	2.90	3.20	3.50	3.80	4.10	4.40	4.70	5.00	5.30	5.60	5.90	5	\$ 5.00
6	1.70	2.00	2.30	2.60	2.90	3.20	3.50	3.80	4.10	4.40	4.70	5.00	5.30	5.60	5.90	6.20	6	\$ 6.00
7	2.00	2.30	2.60	2.90	3.20	3.50	3.80	4.10	4.40	4.70	5.00	5.30	5.60	5.90	6.20	6.50	7	\$ 7.00
8	2.30	2.60	2.90	3.20	3.50	3.80	4.10	4.40	4.70	5.00	5.30	5.60	5.90	6.20	6.50	6.80	8	\$ 8.00
9	2.60	2.90	3.20	3.50	3.80	4.10	4.40	4.70	5.00	5.30	5.60	5.90	6.20	6.50	6.80	7.10	9	\$ 9.00
10	2.90	3.20	3.50	3.80	4.10	4.40	4.70	5.00	5.30	5.60	5.90	6.20	6.50	6.80	7.10	7.40	10	\$ 10.00
12	3.60	4.00	4.40	4.80	5.20	5.60	6.00	6.40	6.80	7.20	7.60	8.00	8.40	8.80	9.20	9.60	12	\$ 12.00
14	4.40	4.90	5.40	5.90	6.40	6.90	7.40	7.90	8.40	8.90	9.40	9.90	10.40	10.90	11.40	11.90	14	\$ 14.00
16	5.20	5.70	6.20	6.70	7.20	7.70	8.20	8.70	9.20	9.70	10.20	10.70	11.20	11.70	12.20	12.70	16	\$ 16.00
18	6.00	6.60	7.20	7.80	8.40	9.00	9.60	10.20	10.80	11.40	12.00	12.60	13.20	13.80	14.40	15.00	18	\$ 18.00
20	6.80	7.50	8.20	8.90	9.60	10.30	11.00	11.70	12.40	13.10	13.80	14.50	15.20	15.90	16.60	17.30	20	\$ 20.00
22	7.60	8.40	9.20	10.00	10.80	11.60	12.40	13.20	14.00	14.80	15.60	16.40	17.20	18.00	18.80	19.60	22	\$ 22.00
24	8.40	9.30	10.20	11.10	12.00	12.90	13.80	14.70	15.60	16.50	17.40	18.30	19.20	20.10	21.00	21.90	24	\$ 24.00
26	9.20	10.20	11.20	12.20	13.20	14.20	15.20	16.20	17.20	18.20	19.20	20.20	21.20	22.20	23.20	24.20	26	\$ 26.00
28	10.00	11.10	12.20	13.30	14.40	15.50	16.60	17.70	18.80	19.90	21.00	22.10	23.20	24.30	25.40	26.50	28	\$ 28.00
30	10.80	12.00	13.20	14.40	15.60	16.80	18.00	19.20	20.40	21.60	22.80	24.00	25.20	26.40	27.60	28.80	30	\$ 30.00
32	11.60	12.90	14.20	15.50	16.80	18.10	19.40	20.70	22.00	23.30	24.60	25.90	27.20	28.50	29.80	31.10	32	\$ 32.00
34	12.40	13.80	15.20	16.60	18.00	19.40	20.80	22.20	23.60	25.00	26.40	27.80	29.20	30.60	32.00	33.40	34	\$ 34.00
36	13.20	14.70	16.20	17.70	19.20	20.70	22.20	23.70	25.20	26.70	28.20	29.70	31.20	32.70	34.20	35.70	36	\$ 36.00
38	14.00	15.60	17.20	18.80	20.40	22.00	23.60	25.20	26.80	28.40	30.00	31.60	33.20	34.80	36.40	38.00	38	\$ 38.00
40	14.80	16.50	18.20	19.90	21.60	23.30	25.00	26.70	28.40	30.10	31.80	33.50	35.20	36.90	38.60	40.30	40	\$ 40.00
42	15.60	17.40	19.20	21.00	22.80	24.60	26.40	28.20	30.00	31.80	33.60	35.40	37.20	39.00	40.80	42.60	42	\$ 42.00
44	16.40	18.30	20.20	22.10	24.00	25.90	27.80	29.70	31.60	33.50	35.40	37.30	39.20	41.10	43.00	44.90	44	\$ 44.00
46	17.20	19.20	21.20	23.20	25.20	27.20	29.20	31.20	33.20	35.20	37.20	39.20	41.20	43.20	45.20	47.20	46	\$ 46.00
48	18.00	20.10	22.20	24.30	26.40	28.50	30.60	32.70	34.80	36.90	39.00	41.10	43.20	45.30	47.40	49.50	48	\$ 48.00
50	18.80	21.00	23.20	25.40	27.60	29.80	32.00	34.20	36.40	38.60	40.80	43.00	45.20	47.40	49.60	51.80	50	\$ 50.00
52	19.60	21.90	24.20	26.50	28.80	31.10	33.40	35.70	38.00	40.30	42.60	44.90	47.20	49.50	51.80	54.10	52	\$ 52.00
54	20.40	22.80	25.20	27.60	30.00	32.40	34.80	37.20	39.60	42.00	44.40	46.80	49.20	51.60	54.00	56.40	54	\$ 54.00
56	21.20	23.70	26.20	28.70	31.20	33.70	36.20	38.70	41.20	43.70	46.20	48.70	51.20	53.70	56.20	58.70	56	\$ 56.00
58	22.00	24.60	27.20	29.80	32.40	35.00	37.60	40.20	42.80	45.40	48.00	50.60	53.20	55.80	58.40	61.00	58	\$ 58.00
60	22.80	25.50	28.20	30.90	33.60	36.30	39.00	41.70	44.40	47.10	49.80	52.50	55.20	57.90	60.60	63.30	60	\$ 60.00
62	23.60	26.40	29.20	32.00	34.80	37.60	40.40	43.20	46.00	48.80	51.60	54.40	57.20	60.00	62.80	65.60	62	\$ 62.00
64	24.40	27.30	30.20	32.90	35.80	38.70	41.60	44.50	47.40	50.30	53.20	56.10	59.00	61.90	64.80	67.70	64	\$ 64.00
66	25.20	28.20	31.20	34.00	37.00	39.90	42.90	45.90	48.90	51.90	54.90	57.90	60.90	63.90	66.90	69.90	66	\$ 66.00
68	26.00	29.10	32.20	35.10	38.20	41.30	44.40	47.50	50.60	53.70	56.80	59.90	63.00	66.10	69.20	72.30	68	\$ 68.00
70	26.80	30.00	33.20	36.20	39.40	42.60	45.80	49.00	52.20	55.40	58.60	61.80	65.00	68.20	71.40	74.60	70	\$ 70.00
72	27.60	30.90	34.20	37.20	40.50	43.80	47.10	50.40	53.70	57.00	60.30	63.60	66.90	70.20	73.50	76.80	72	\$ 72.00
74	28.40	31.80	35.20	38.20	41.60	45.00	48.40	51.80	55.20	58.60	62.00	65.40	68.80	72.20	75.60	79.00	74	\$ 74.00
76	29.20	32.70	36.20	39.20	42.60	46.10	49.60	53.10	56.60	60.10	63.60	67.10	70.60	74.10	77.60	81.10	76	\$ 76.00
78	30.00	33.60	37.20	40.20	43.60	47.10	50.60	54.10	57.60	61.10	64.60	68.10	71.60	75.10	78.60	82.10	78	\$ 78.00
80	30.80	34.50	38.20	41.20	44.70	48.20	51.70	55.20	58.70	62.20	65.70	69.20	72.70	76.20	79.70	83.20	80	\$ 80.00
82	31.60	35.40	39.20	42.20	45.80	49.40	53.00	56.60	60.20	63.80	67.40	71.00	74.60	78.20	81.80	85.40	82	\$ 82.00
84	32.40	36.30	40.20	43.20	46.90	50.60	54.30	58.00	61.70	65.40	69.10	72.80	76.50	80.20	83.90	87.60	84	\$ 84.00
86	33.20	37.20	41.20	44.20	48.00	51.80	55.60	59.40	63.20	67.00	70.80	74.60	78.40	82.20	86.00	89.80	86	\$ 86.00
88	34.00	38.10	42.20	45.20	49.10	53.00	56.90	60.80	64.70	68.60	72.50	76.40	80.30	84.20	88.10	92.00	88	\$ 88.00
90	34.80	39.00	43.20	46.20	50.20	54.20	58.20	62.20	66.20	70.20	74.20	78.20	82.20	86.20	90.20	94.20	90	\$ 90.00
92	35.60	39.90	44.20	47.20	51.30	55.40	59.50	63.60	67.70	71.80	75.90	80.00	84.10	88.20	92.30	96.40	92	\$ 92.00
94	36.40	40.80	45.20	48.20	52.40	56.60	60.80	65.00	69.20	73.40	77.60	81.80	86.00	90.20	94.40	98.60	94	\$ 94.00
96	37.20	41.70	46.20	49.20	53.50	57.80	62.10	66.40	70.70	75.00	79.30	83.60	87.90	92.20	96.50	100.80	96	\$ 96.00
98	38.00	42.60	47.20	50.20	54.60	59.00	63.40	67.80	72.20	76.60	81.00	85.40	89.80	94.20	98.60	103.00	98	\$ 98.00
100	38.80	43.50	48.20	51.20	55.70	60.20	64.70	69.20	73.70	78.20	82.70	87.20	91.70	96.20	100.70	105.20	100	\$ 100.00

IMPORTANT--In ordering, always state the kind of work you wish to do, what shape face you want on the wheels, the size of mandrel hole, and the speed they are to run. Special wheels for running in water made to order.

Price List--Cup Wheels

Diam. Height Inches Inches		Thickness of Rim and Back in Inches							
		1		2		3		4	
8"	4	\$19.25	.....	.....	.....	.....	.....	.....	.....
	5	18.90	.....	.....	.....	.....	.....	.....	.....
	6	21.45	.....	.....	.....	.....	.....	.....	.....
	7	23.65	.....	.....	.....	.....	.....	.....	.....
Back per inch		4	18.25	.....	.....	.....	.....	.....	.....
9"	4	\$19.25	.....	.....	.....	.....	.....	.....	.....
	5	21.55	.....	.....	.....	.....	.....	.....	.....
	6	24.10	.....	.....	.....	.....	.....	.....	.....
	7	26.30	.....	.....	.....	.....	.....	.....	.....
Back per inch		4	21.00	.....	.....	.....	.....	.....	.....
10"	4	\$27.75	.....	.....	.....	.....	.....	.....	.....
	5	28.45	.....	.....	.....	.....	.....	.....	.....
	6	31.45	.....	.....	.....	.....	.....	.....	.....
	7	33.55	.....	.....	.....	.....	.....	.....	.....
Back per inch		4	25.90	.....	.....	.....	.....	.....	.....
12"	4	\$38.50	.....	.....	.....	.....	.....	.....	.....
	5	39.60	.....	.....	.....	.....	.....	.....	.....
	6	43.45	.....	.....	.....	.....	.....	.....	.....
	7	45.00	.....	.....	.....	.....	.....	.....	.....
Back per inch		4	38.15	1.50	2.10	.....	.....	.....	.....
14"	4	1.80	34.20	36.00	37.50	38.55	\$39.25	\$39.60	.....
	5	37.45	40.00	42.85	44.20	45.60	46.90	47.50	.....
	6	42.60	45.90	48.55	50.55	52.35	53.90	54.75	.....
	7	45.90	52.60	55.05	56.85	58.60	60.00	61.50	62.25
Back per inch		4	39.75	41.10	45.60	46.35	44.55	70.30	71.10
16"	4	2.25	2.15	1.85	1.50	1.25	.....	.....	.....
	5	39.75	42.05	45.90	47.25	48.30	49.80	50.85	.....
	6	45.75	51.25	54.15	56.50	57.95	59.80	60.80	.....
	7	48.55	59.05	62.40	65.25	66.85	68.85	70.25	.....
Back per inch		4	42.30	69.85	70.45	74.05	75.85	78.70	80.00
18"	4	3.75	75.40	80.75	84.60	86.60	89.95	91.05	.....
	5	3.65	81.25	87.75	92.75	95.85	98.85	1.50	.....
	6	52.40	55.15	58.30	60.85	62.80	64.05	65.85	.....
	7	60.25	64.60	68.25	71.25	73.75	75.40	77.75	.....
20"	4	77.25	73.75	78.00	81.05	84.40	86.50	88.50	.....
	5	81.75	87.00	91.00	95.20	98.20	99.80	100.80	.....
	6	88.50	95.15	100.85	105.80	108.80	111.75	114.75	.....
	7	95.15	101.35	109.35	115.15	119.70	123.75	.....	.....

EMERY WHEELS

In grading Emery Wheels we use the numerals 1 to 6 with fractions $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$. No. 1 is softest wheel made; No. 6 is the hardest. These figures pertain exclusively to the degree of hardness of wheels and not to grain of material.

It is generally advisable to explain the purpose for which wheels are to be used and allow us to do the grading, but for the information of buyers and as a key by which to determine the approximate grade suitable for any specified grinding, the following is submitted:

TABLE OF GRADES

Kind of Work	Number of Corundum	Degree of Hardness	Grain & Grade for Exceptional Cases	
			Sometimes as soft as	Sometimes as hard as
General Machine Work.....	30 to 36	$3\frac{1}{4}$ or $3\frac{1}{2}$	3	...
Saw Gumming	36 to 46	$2\frac{1}{2}$	2	3
Large Wheel Water Tool Grinding.....	24	$3\frac{1}{2}$	...	$3\frac{3}{4}$
Small Wheel Water Tool Grinding.....	30	$3\frac{1}{4}$	3	$3\frac{1}{2}$
Large Malleable Castings.....	16	$3\frac{3}{4}$	...	4
Small Malleable Castings.....	20	$3\frac{1}{2}$	$3\frac{1}{4}$	$3\frac{3}{4}$
Chilled Iron Castings.....	16	$3\frac{3}{4}$	$3\frac{1}{2}$	4
Wrought Iron	16	$3\frac{3}{4}$	$3\frac{1}{4}$	...
Rough Grinding, general foundry use..	16	$3\frac{1}{2}$	$3\frac{1}{4}$	$3\frac{3}{4}$
Brass Castings	30	3	$2\frac{1}{2}$	$3\frac{3}{4}$
Bronze Castings	20	$3\frac{1}{2}$	$3\frac{1}{4}$	...
Lathe and Planer Tools.....	26	$3\frac{1}{4}$	...	$3\frac{3}{4}$
Small Tools	60	$3\frac{1}{4}$	3	$3\frac{1}{2}$
Wood Working Tools.....	46	$2\frac{1}{2}$	2	3
Twist Drills, hand work.....	46	3	...	...
Twist Drills, spec. mach.....	46	2	...	...
Reamer, Tap, Milling Cutters, Etc., hand grinding	46	3	...	...
Reamer, Tap, Mill'g Cutters, spec. mach.....	60	2	...	...
Stove Mountings	20	$3\frac{3}{4}$	$3\frac{1}{2}$	...
Drop Forgings	30	$3\frac{1}{2}$	...	...
Car Wheel Grinding	20	$3\frac{1}{2}$	3	4
Planing Mill and Paper Cutter Knives..	30	2	...	$3\frac{1}{4}$
Jointing and Edging Agricultural Implements	16	$3\frac{3}{4}$	$3\frac{1}{4}$	4
Large Steel Castings.....	16	$3\frac{3}{4}$	$3\frac{1}{2}$	4
Finish'g Edges of Stoves.....	36	$3\frac{1}{4}$	$3\frac{1}{2}$	...

CLOVER GRINDING COMPOUND

4-Ounce Duplex Can



FIG. 1864

Has many uses, among which grinding valves, lapping of all kinds of steel and cast iron, grinding pistons into cylinders, running together gearing, grinding crank shafts into bearings, polishing, surfacing, etc.

The 4-ounce can is designed for the kit, and fitted with two tight screw covers. It contains two ounces each of grades C for roughing, and A for finishing.

1-Pound Can



FIG. 1865

The 1-pound can is for the machine shop and manufacturer, made in 6 grades, 1-A (very fine), A, B, C, D and E (very coarse).

Price, 4-ounce Duplex Can.....per can, \$0.45
Price, 1-pound can.....per can, 1.40

EMERY WHEEL DRESSERS

Every grinding wheel is bound to glaze sooner or later, generally after a few hours use. When glazed—when, in other words, its grit, its cutting element, is dulled and its surface is clogged with the material ground, every minute it is used without being dressed means increased labor-cost. The wheel soon also wears out of true, out of round and becomes unbalanced. This not only adds to the danger but impairs the efficiency of the wheel—adds again to the labor-cost.

The economic rule and the safe rule is to use the right sort of dresser the moment the wheel shows signs of glaze, or of running out of balance.

"TRUEDGE"

EMERY WHEEL DRESSER



FIG. 1866

The TRUEDGE.—If it is a fine wheel and important that the edges shall be sharp, not broken as the common dresser is bound to be, use the TRUEDGE; for in most cases it does better work than the diamond because the diamond always makes the wheel still finer and cuts less. For wheels for precision grinding the TRUEDGE dresser has no equal. It throws the dust downward.

List price, \$12 dozen. Extra Cutters, list price, \$2 dozen sets.

Extra Bushings or Pins, list price, 60 cents dozen.

"HUNTINGTON"

EMERY WHEEL DRESSER

Huntington

Cutter No. 1

Cutter No. 2



FIG. 1867



FIG. 1868



FIG. 1669

Huntington Emery Wheel Dresser.....	each	\$0.50
Extra Cutters, No. 1.....	per set	.10
Extra long Cutters, No. 2.....	per set	.15

EMERY WHEEL DRESSERS

Collmer No. 1

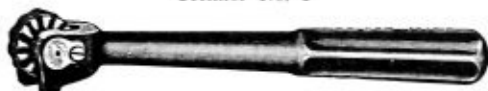


FIG. 1870

No. 1 Collmer Emery Wheel Dresser.....each \$1.00

No. 1



FIG. 1871

EXTRA CUTTERS, NO. 1

Per set	\$0.20
Lots of 12	2.00
Lots of 50	.12
Lots of 100	.10
Lots of 500	.09

EXTRA CUTTERS, NO. 2

Per set	\$0.20
Lots of 12	2.00
Lots of 50	.12
Lots of 500	.10
Lots of 100	.09

No. 2

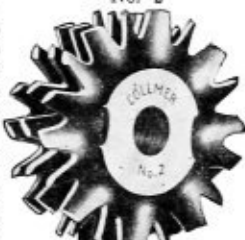


FIG. 1872

Collmer No. 3



FIG. 1873

No. 3 Collmer Emery Wheel Dresser.....each \$1.50

NO. 3 CUTTERS FOR NO. 3
COLLMER DRESSERS

The Collmer No. 3 Cutter is the same style cutter as Collmer No. 2. It is larger in size, however, having dimensions as follows: Diameter, 2 1/4 inches; width, 3/8 inch; bore, 3/8 inch. It is made from carefully tempered sheet steel, cuts fast and wears well. The practical workman can secure far superior results by using this cutter for truing large size emery wheels than from any other cutter now on the market that is designed for this purpose. The Collmer Cutter not only trues the wheel, but its makeup is such that it sharpens the wheel as well—making the emery wheel much faster cutting. The Collmer No. 3 cutter is especially adapted for truing large wheels for rough grinding. The Collmer No. 4 for smooth grinding. No. 4 is same as No. 1, but dimensions are like No. 3.

Price, each\$0.35

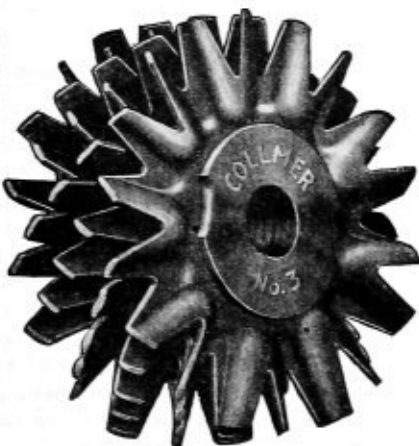
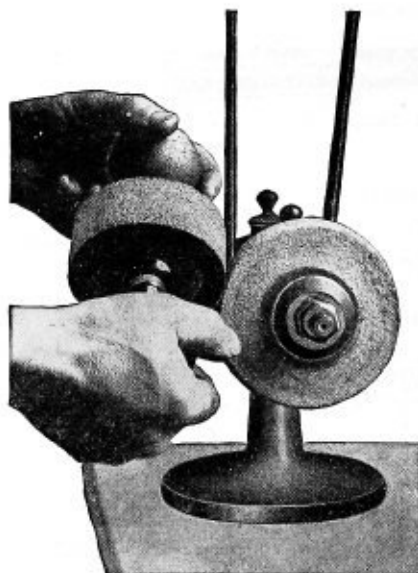


FIG. 1874

METCALF EMERY WHEEL DRESSER



It is a veritable wizard for truing down and shaping grinding wheels of all kinds of ordinary size, up to 14 x 1 inch. It is difficult for the average person to understand how it can do the work until it is seen in operation, and even then "you can hardly believe your eyes."

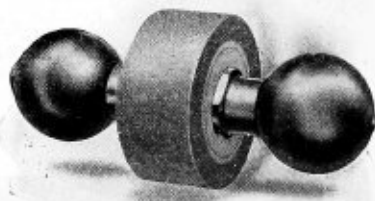


FIG. 1875

The Dresser consists of two heavy knobs at the ends of a short shaft, with an abrasive wheel of special grade and grit mounted on a sleeve between them. The knobs are of iron to give weight and are held in the hands when the Dresser is in use.

A wheel can be given a coarse, open face, for rapid cutting, by holding the Dresser with its axis about horizontal; while on the other hand, a fine, close grained face, for smooth work, will be given to the wheel by holding the Dresser with the axis nearly vertical. For shaping thin, hard wheels, used on fine tooth saws, this dresser surpasses all other tools ever produced.

A special advantage of the Metcalf Dresser is in bringing up a sharp corner on thin or delicate wheels. For this work it has no equal, as a diamond or an ordinary dresser is sure to break off the corner even when handled with great care, while this Dresser will bring it up as sharp as a razor in a moment's time.

The use of the Dresser is not confined to truing or shaping wheels only, but is of great value in freshening up the face, either when glazed over or when filled up from grinding soft metals, etc., which cling to the wheel.

Many other uses will suggest themselves, as we find new ones coming up constantly, such as polishing Pulleys and Gas Engine Fly-Wheels, after a roughing chip only has been taken over them.

Priceeach \$6.00

STERLING GRINDERS

No. $\frac{1}{2}$ 

FIG. 1876

Nos. 0 & 00



FIG. 1877

No. Grinder	$\frac{1}{2}$	00	0
For Size Wheel.....in.	6	10	12
Length of arbor.....in.	$10\frac{5}{8} \times 4\frac{1}{2}$	10×10	12×12
Bench space.....in.	$10\frac{3}{4}$	14	$14\frac{1}{2}$
Diameter of arbor between flanges.....in.	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$
Bearings.....in.	$1\frac{1}{8}$	$2\frac{3}{4} \times 1\frac{1}{2}$	$2\frac{1}{2} \times 1\frac{1}{2}$
Diameter of flanges.....in.	2	3	$3\frac{1}{4}$
Height to center of arbor.....in.	$5\frac{1}{4}$	7	8
Pulley.....in.	$2 \times 1\frac{1}{8}$	$2\frac{1}{2} \times 2\frac{1}{4}$	$2\frac{1}{2} \times 2\frac{1}{4}$
Weight.....lbs.	10	25	30
Price.....each	\$4.00	5.00	6.00

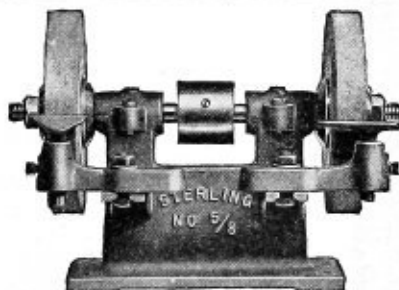


FIG. 1878

No. Grinder	$\frac{5}{8}$	1	$1\frac{1}{2}$	*2	3
For Size Wheel.....in.	8	10	12	14×2	14
Bench space.....in.	$14 \times 4\frac{1}{4}$	18×6	19×6	26×8	26×8
Length of arbor.....in.	14	18	19	$23\frac{1}{4}$	26
Diameter of arbor between flanges.....in.	$\frac{5}{8}$	$\frac{3}{4}$	1	1	1
Bearings.....in.	$2\frac{1}{2}$	$3 \times \frac{3}{4}$	$3\frac{1}{2} \times 1\frac{1}{8}$	4	$4\frac{3}{4} \times 1\frac{1}{2}$
Diameter of flanges.....in.	$2\frac{1}{2}$	$3\frac{1}{2}$	$4\frac{1}{2}$	5	5
Height to cent. of arbor.....in.	6	$7\frac{1}{2}$	8	9	$9\frac{1}{4}$
Pulley.....in.	$2\frac{1}{4} \times 2$	$2\frac{1}{2} \times 2\frac{1}{4}$	3×3	$3 \times 3\frac{1}{2}$	$3 \times 3\frac{1}{2}$
Weight.....lbs.	20	35	50	55	85
Price.....each	\$6.00	7.50	9.50	11.50	15.00

Prices do not include wheels.

*No. 2 machine equipped wheel at one end only.

STERLING GRINDER COUNTERSHAFTS
AND COLUMNS

No. 0

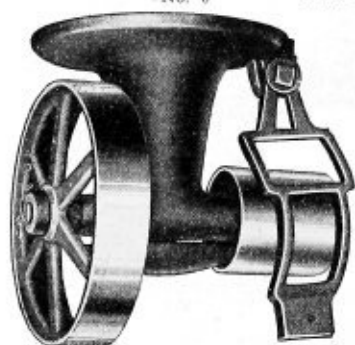


FIG. 1879

No. 1

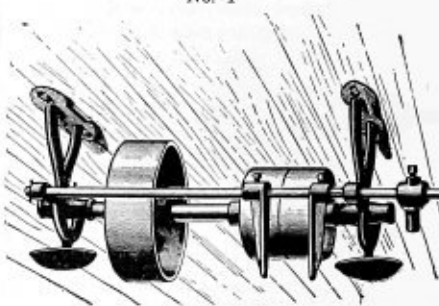


FIG. 1880

No countershaft	0	1
For grinder	Nos. $\frac{1}{2}$, 00, 0 & 1	$1\frac{1}{2}$, 2 & 3
Drop	3 $\frac{3}{8}$ in.	7 $\frac{1}{2}$ in.
Length of spindle	14 $\frac{1}{2}$ in.	24 in.
Tight and loose pulleys	5x2 $\frac{1}{4}$ in.	6x3 $\frac{1}{4}$ in.
Driving pulley	12x2 $\frac{1}{4}$ in.	10x3 $\frac{1}{4}$ in.
Speed	r. p. m. 525	525
Price	each \$7.50	8.00



FIG. 1881

NO. 1 COLUMN

Used with No. $\frac{1}{2}$, 00, 0, 1, and $1\frac{1}{2}$ Grinders.

Height	28 in.
Size of table	10x5 $\frac{1}{2}$ in.
Floor space	13 $\frac{1}{2}$ x15 in.
Weight	63 pounds
Price	each, \$5.00

NO. 3 COLUMN

Used with No. 2 and 3 Grinders.

Height	32 in.
Size of table	14x7 in.
Floor space	17x15 $\frac{1}{2}$ in.
Weight	104 pounds
Price	each, \$7.50

GRINDING WHEEL GUARDS

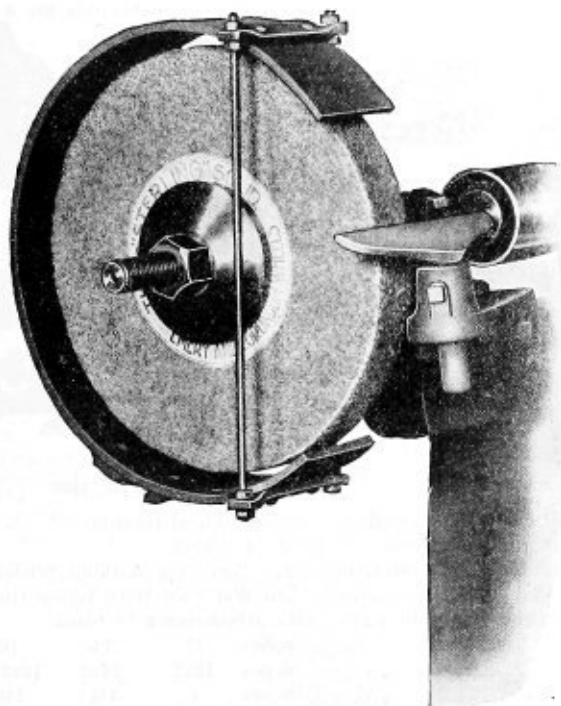


FIG. 1882

Sterling Grinders may all be equipped with Guards or Protection Hoods over the wheels. The above illustration gives you an excellent idea of just what these protectors are like. They are made of steel and securely bolted to the machines. Being adjustable they are so arranged as to follow the wheel when it wears down. Simple in construction, they will be found satisfactory in every respect. Prices of each as arranged for various Sterling Grinders as follows:

For No. $\frac{1}{2}$ Bench Grinder	\$ 4.00
For No. $\frac{3}{8}$ Bench Grinder	4.00
For No. 1 Bench Grinder	6.00
For No. $1\frac{1}{2}$ Bench Grinder	6.00
For No. 3 Bench Grinder	6.00
For No. 4 Floor Grinder	6.00
For No. 5 Floor Grinder	10.00
For No. 6 Floor Grinder	13.50
For No. 7 Floor Grinder	16.00
For No. 6T Floor Grinder	6.00

Should only one Guard be required be sure and mention on which side of grinder it will be used.

CHALLENGE BENCH EMERY GRINDERS

Unit No. 1

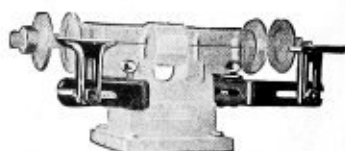


FIG. 1883

Combination No. 6



FIG. 1884

Combination No. 30

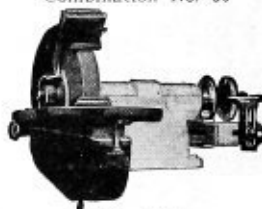


FIG. 1885

Combination No. 36



FIG. 1886

Unit No. 1—Plain Dry Bench Grinder Without Wheel Guards.

Comb. No. 6—Plain Dry Bench Grinder With Wheel.

Comb. No. 30—Plain Dry Bench Grinder and Wet Tool Without Wheel Guard.

Comb. No. 36—Plain Dry Bench Grinder and Wet Tool With Wheel Guard.

Cuts above show heads in white, with attachments in black.

Size	12	14	16	18
Wheels, up to.....inches	12x2	14x2	16x2½	18x3
Hole in wheels.....inches	1	1¼	1½	1¾
Unit No. 1, List Price.....each	\$20.00	25.00	40.00	50.00
Combination No. 6.....each	50.00	61.00	82.00	98.00
Combination No. 30.....each	70.00	95.00	130.00	150.00
Combination No. 36.....each	85.00	113.00	151.00	174.00
Countershafts for above.....each	13.00	19.00	20.00	22.00

For detail illustration Countershafts and Columns for above, see following page.

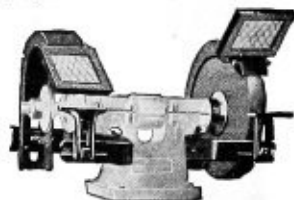


FIG. 1887

WHEEL GUARD, UNIT NO. 158

This wheel guard (two are shown in cut in black) is forged from heavy U-shaped steel. It encloses the "path" of the wheel except where work is applied. The upper part has detachable wire-inserted plate glass adjustable eye shield.

Sizes	12	14	16	18
For wheels up to.....inches	12x2	14x2	16x2½	18x3
List Prices, one guard only.....	\$15.00	18.00	21.00	24.00

CHALLENGE BENCH EMERY GRINDER COUNTERSHAFTS

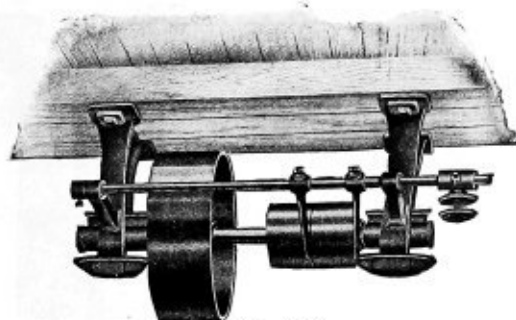


FIG. 1888

Sizes	inches	12	14	16	18
List Prices	each	\$13.00	19.00	20.00	22.00
Driving Pulley	inches	9 $\frac{3}{8}$ x2 $\frac{1}{2}$	12x3	12x3 $\frac{1}{2}$	13x4 $\frac{1}{2}$
Tight and Loose Pulleys.....	inches	5 $\frac{3}{4}$ x2 $\frac{1}{2}$	5x3 $\frac{1}{4}$	5x3 $\frac{3}{4}$	5x4 $\frac{1}{2}$
Distance from Shaft to Ceiling.....	inches	7	7 $\frac{1}{2}$	7 $\frac{1}{2}$	8 $\frac{1}{2}$
Distance Between Hangers.....	inches	17 $\frac{1}{2}$	20	21 $\frac{1}{2}$	29
Speed Driving Pulley.....	r. p. m.	575	450	525	575
Weight	lbs.	50	65	75	125

COLUMNS FOR CHALLENGE FLOOR EMERY GRINDERS



FIG. 1889

This Column is made in four sizes and is arranged for any Challenge Head of corresponding size. This is a rear view; it is closed in front.

It is so arranged the Head may also be driven from the floor below.

Sizes	inches	12	14	16	18
List Prices	each	\$18.00	19.00	20.00	22.00
Size, Bottom	inches	12x10	17x14	18x15	20x16
Size, Top	inches	9x8	11 $\frac{1}{2}$ x9	13x10	15 $\frac{1}{2}$ x11 $\frac{1}{4}$
Height	inches	29	28	26	24
Weight	lbs.	165	235	250	265

RANSOM NEW GRINDING MACHINES

BENCH TYPE



FIG. 1890



FIG. 1891

These machines are made with self-oiling bearings and self-closing nickel plated oil hole covers. Bearings are of cast iron, self-oiling and adjustable. Spindle steel is of high carbon and is ground accurately.

The rests are very rigid, made of one piece and are adjustable for different widths and diameters of wheels.

When wheel guards are required, the rests are removed and the guards fastened on the same way as the rests. In this guard we have combined the guard and rest in one casting.

Unless specially ordered, machines will be shipped without guards, but with rests as shown in left-hand cut.

Size of Machine.....	8 in.	10 in.	12 in.	14 in.
Wheel capacity.....	8 in. x 1 in.	10 in. x 1½ in.	12 in. x 2 in.	14 in. x 2½ in.
Height to center of spindle.....	4½ in.	6 in.	7 in.	8 in.
Height when on column.....	39 in.	39 in.	38 in.	37 in.
Dia. spindle bet. collars.....	¾ in.	7⁄8 in.	1 in.	1¼ in.
Length of bearings.....	2½ in.	3½ in.	4 in.	4½ in.
Diameter of collars.....	2⅞ in.	3¼ in.	4 in.	4½ in.
Pulley on arbor.....	2x2½ in.	3x2¾ in.	3¾x3¾ in.	4½x3¾ in.
Tight and loose pulley on countershaft.....	4x3½ in.	6x3¼ in.	6x3¼ in.	6x4¼ in.
Speed of countershaft.....	475	475	500	510
Wgt. complete with guards.....	140 lbs.	225 lbs.	280 lbs.	410 lbs.

Prices on application.

In ordering state plainly whether head only or head, column and countershaft are wanted.

STERLING FLOOR GRINDING MACHINE

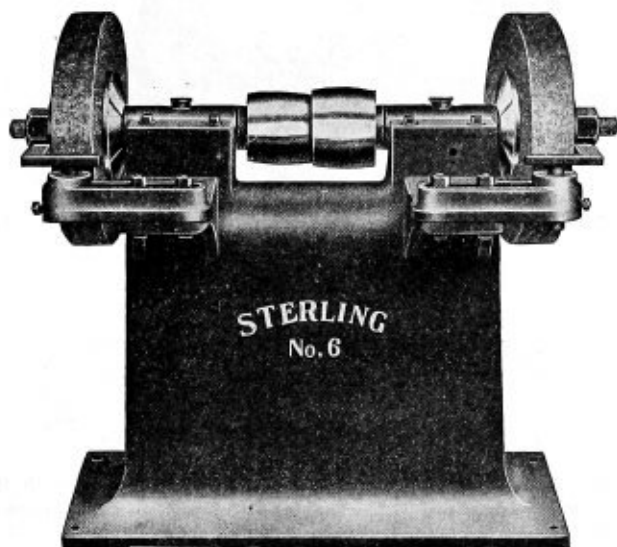


FIG. 1892

	No. 4	No. 5	No. 6	No. 7
Floor Space	34x24	45x24	51x25	62x26
Length of Arbor.....	35	45	51	62
Distance Between Wheels.....	24	30	36	45
Height to Center of Arbor.....	35	34	33	32
Length of Bearings.....	7	9	10	12
Diameter of Arbor Betw'n Collars.....	1½	1½	1¾	2
Diameter of Collars.....	5½	8	10	12
Cone Pulley on Arbor.....	3½x5x3¼	5x6x4¼	6x7x5½	8x9x7
Weight with Countershaft.....	530	840	1150	1350
Size of Wheels.....	16x4	18x3	20x3½	24x4

List Price—

Grinder	\$80.00	98.00	118.00	135.00
Countershaft	14.00	16.00	18.00	20.00

List Prices do not include Grinding Wheels.

NO. 6 "T" STERLING GRINDING AND POLISHING MACHINE

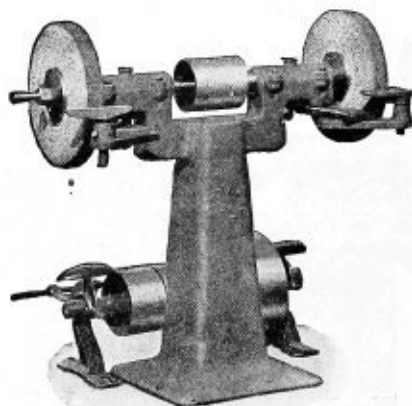


FIG. 1893

We herewith illustrate a new machine which we introduce to the trade, intended to meet all the wants of the manufacturers using grinding and polishing wheels, such as foundries, plow factories, machine shops, etc.

We furnish these machines with tight and loose pulleys or countershafts, as may be desired, and in many cases have arranged the arbors with cone pulleys.

DIMENSIONS

Steel Spindle, length.....	48 in.	Height of Machine.....	35 in.
In the Bearings.....	1½ in.	Base	19x19 in.
Between the Flanges.....	1¼ in.	Pulleys usually furnished.....	4x4 in.
Bearings are self oiling, length.....	11 in.	Distance Between Wheels.....	36 in.

Machine will carry wheels up to 4½ inches thick.

List Price Without Countershaft, \$40.00

Price does not include wheels.

NO. 2 COUNTERSHAFT

Drop of Hangers.....	8 in.	Tight and Loose Pulleys.....	8x4½ in.
Driving pulleys			12x4½ in.

Total weight of complete machine 500 pounds.

Speed for general grinding should be about 500 revolutions per minute. For polishing, speed may be increased to about 625.

List Price, \$10.00

STERLING 10-INCH WET TOOL GRINDER

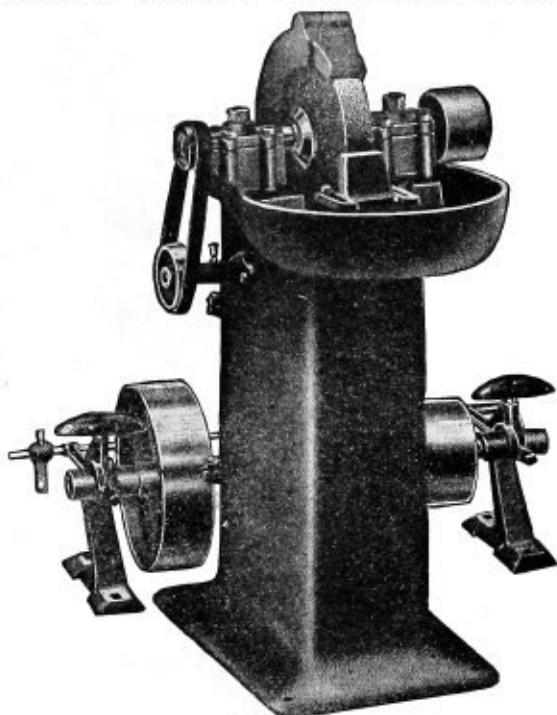


FIG. 1894

Something new. Something different. No pumps to rust and get out of order. A simple device inside the column furnishes a sufficient quantity of water to the wheel in operation. When the machine stops the water drains out of the wheel, leaving it dry and in balance. This Grinder will not splash oil and water over the floor. Can be used as a dry grinder by removing small belt on left hand side.

Each grinder is equipped with a 10x2-inch grinding wheel of special material.

DIMENSIONS

Floor space	20 x 22 inches
Bearing (self oiling)	4 x 1 inches
Height to center of arbor	36 inches
Pulley	3 x 2½ inches
Diameter of flanges	4 inches

Weight complete with countershaft, 270 pounds.

Price, with countershaft and one 10 x 2-inch wheel, \$45.00

NO. O COUNTERSHAFT

Solid base. Can be placed in any position.

Drop	8¾ inches
Length of spindle	14½ inches
Tight and loose pulley	5 x 2¼ inches
Driving pulley	12 x 2¼ inches

Speed of countershaft 525 revolutions per minute.

Price

\$7.50

STERLING SINGLE WET TOOL GRINDER

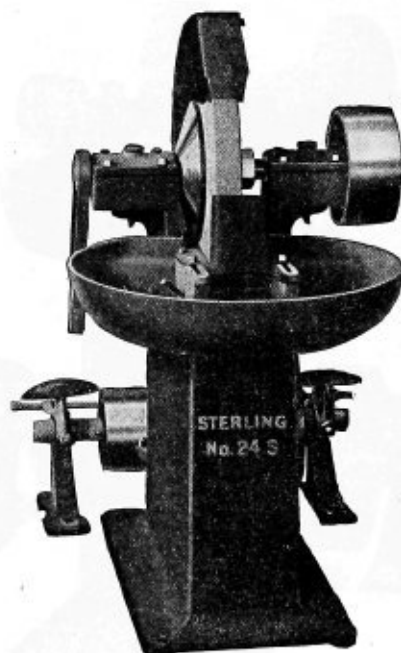


FIG. 1895

Size Machine	Inch	14	24
DIMENSIONS			
Floor space	inches	18x24	45x30
Bearings (self oiling).....	"	6x1 $\frac{1}{4}$	7x1 $\frac{3}{8}$
Height to center of arbor.....	"	37	37
Pulley	"	4 $\frac{1}{2}$ x3 $\frac{1}{2}$	10x4 $\frac{1}{2}$
Diameter of flanges.....	"	4 $\frac{1}{2}$	12
Weight complete with countershaft.....	pounds	550	900

Price with Countershaft and one 14x2-inch wheeleach, \$ 70.00

Price with Countershaft and one 24x2-inch wheeleach, 104.00

COUNTERSHAFT			
Drop of hangers.....	inches	8	10
Length of spindle.....	"	30	32
Size of tight and loose pulleys.....	"	8x4	8x4½
Size of driving pulley.....	"	14x4	14x4½
Speed of countershaft.....	R. P. M.	425	500
Price	each	\$12.00	\$14.00

STERLING 24-INCH DOUBLE TOOL GRINDER

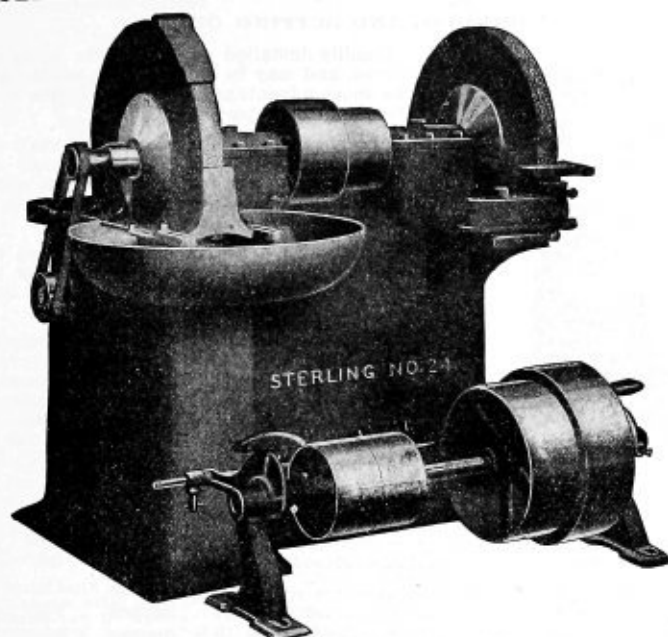


FIG. 1896

DIMENSIONS

Floor space	52x45 in.
Length of spindle	48 in.
Distance between wheels	35 in.
Diameter of spindle in bearings	2 in.
Diameter of spindle between flanges	1¾ in.
Length of self-oiling bearings	10 in.
Diameter of flanges	12 in.
Height of machine to center of spindle	36 in.
Diameter of spindle pulleys	10 in. and 8 in. x 5½ in. face
Weight of machine with countershaft	1800 lbs.

Price with countershaft and one 24x2 in. Tool Wheel \$200.00

COUNTERSHAFT

Drop of hangers	10 in.
Length of spindle	52 in.
Size of tight and loose pulleys	8x6½ in.
Size of driving pulley	14 in. and 16 in. x 5½ in. face
Speed of countershaft	500 R. P. M.

Price \$19.00

U. S. BALL BEARING GRINDERS

GRINDING AND BUFFING OUTFITS



FIG. 1897

Readily installed as shop tools, being self-contained, and may be located or re-located at will in the most advantageous positions with respect to the work to be performed.

The absence of belts, shafts and shaft hangers, allowable when direct-connected tools are employed, permits the free use of cranes, affords better light and most advantageous location of each working unit.

The bearings are of direct-connected tools, as well, are relieved from any belt pull or slippage, and in general, greater efficiency and increased shop output results.

Motors are totally enclosed and equipped with especially heavy shafts and large dust-proof bearings, to insure reliability and minimum wear. Ball bearings used for bearings. Emery wheels are not furnished. Alternating current grinder made for 220-440 volts, 25 or 60 cycle, 2 or 3-phase. Direct current, 110, 220 or 550 volts. Variable speed.

Horse Power	3	5
Size of Emery Wheels	12x2	18x3
Length of Spindle	30	48
Diameter of Arbor	1 1/4	1 1/2
Length of Bearings	9 1/2	10 1/2
Size of Floor Base	26x27	28x30
Floor to Center of Arbor	36	36
Speed	R. P. M. 1800	1120
Weight	675	875

HEAVY DUTY GRINDERS

Motors wound for direct current 110, 220 or 550 volts. Alternating current, 2 or 3-phase, 110, 220, 440 or 550 volts. Motors can be furnished with push button charge. Ball bearings used for bearings.

Horse Power of Motor	5	7 1/2
Carries Two Wheels		
..... inches	18x3, 24x4	24x4
Journals	1 1/2x2 1/4	1 1/2x2 1/4
Length of Arbor	62	63
Arb. Where Wheel goes on	2	2
Ht. Where Wheel goes on	34	34
Speed	R. P. M. 800, 1120	800
Weight	1600	1975

Prices quoted upon application.

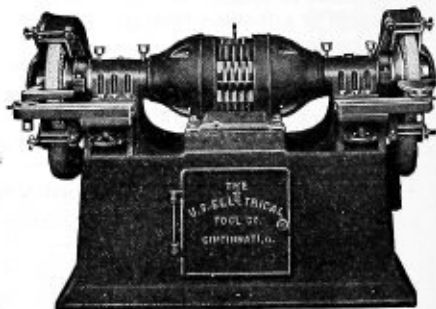


FIG. 1898

STERLING SWING FRAME GRINDERS

With Enclosed Hood

With Guard Over Wheel



FIG. 1899



FIG. 1900

SWING FRAME GRINDERS WITH ENCLOSED HOOD

16 Inch	20 Inch	24 Inch
Diam. of Spindle....1½ in.	Diam. of Spindle....1¾ in.	Diam. of Spindle....2 in.
Diam. of Bearings....1½ in.	Diam. of Bearings....1½ in.	Diam. of Bearings....1½ in.
Diam. of Flanges....7 in.	Diam. of Flanges....10 in.	Diam. of Flanges....12 in.
Tight and loose pulleys.....8x4 in.	Tight and loose pulleys.....8x4½ in.	Tight and loose pulleys.....8x5 in.
Speed of Countershaft.....300 r. p. m.	Speed of Countershaft.....300 r. p. m.	Speed of Countershaft.....300 r. p. m.
Weight complete about.....500 lb.	Weight complete about.....700 lb.	Weight complete about.....1375 lb.
Machine fitted with pulleys for "V" shape belts. 2½ in. flat belts can be used.	Machine fitted for flat belts 3½ in. wide.	Machine fitted for flat belts 4½ in. wide.
Will carry 16x2½ straight side wheel or Safety Shape ¾ taper 16x2 wheel. Without extra collars.	Will carry 20x3½ straight side wheel or Safety Shape ¾ taper 20x2½ wheel. Without extra collars.	Will carry 24x4 straight side wheel or Safety Shape ¾ taper 24x2½ wheel. Without extra collars.
List Price .....\$103.00	List Price .....\$140.00	List Price .....\$202.00

SWING FRAME GRINDERS, STEEL GUARD OVER WHEEL

16 Inch	20 Inch	24 Inch
Diam. of Spindle....1½ in.	Diam. of Spindle....1¾ in.	Diam. of Spindle....2 in.
Diam. of Bearings....1½ in.	Diam. of Bearings....1½ in.	Diam. of Bearings....1½ in.
Diam. of Flanges....7 in.	Diam. of Flanges....10 in.	Diam. of Flanges....12 in.
Tight and loose pulleys.....8x4 in.	Tight and loose pulleys.....8x4½ in.	Tight and loose pulleys.....8x5 in.
Speed of Countershaft.....300 r. p. m.	Speed of Countershaft.....300 r. p. m.	Speed of Countershaft.....300 r. p. m.
Weight complete about.....450 lb.	Weight complete about.....700 lb.	Weight complete about.....1250 lb.
Machine fitted with pulleys for "V" shape belts. 2½ in. flat belts can be used.	Machine fitted for flat belts 3½ in. wide.	Machine fitted for flat belts 4½ in. wide.
Will carry 16x2½ straight side wheel or Safety Shape ¾ taper 16x2 wheel. Without extra collars.	Will carry 20x3½ straight side wheel or Safety Shape ¾ taper 20x2½ wheel. Without extra collars.	Will carry 24x4 straight side wheel or Safety Shape ¾ taper 24x2½ wheel. Without extra collars.
List Price .....\$90.00	List Price .....\$125.00	List Price .....\$184.00

The prices printed do not include belts or wheels.

When ordering always give the distance from the ceiling to the floor in order that we may furnish the correct length of tubing.

These machines are usually swung about three feet from the floor; suspended from the ceiling, and are so constructed that all stretch in the belt can be readily taken up.

IMPROVED "SUCCESS" EMERY GRINDER



FIG. 1901

The greatest grinder on earth for grinding drills, castings, machine parts, scissors, knives and all kinds of tools. It is just the thing for bicycle repairmen, blacksmiths, carpenters, butchers, harness makers, wagon makers, farmers, mechanics, jewelers.

With the Success Emery Grinder 3,000 revolutions a minute can be attained easily by a simple and easy motion of the foot; grinds twice as fast as any grindstone, and requires no turning—one person does it all.

When set up is 4 feet high; standard is made of $\frac{3}{4}$ -inch tubing, and is very solid and strong; has no belt to slip, loosen or break, neither has it lead gear teeth to wear out and bind.

The emery wheel is of the highest grade, 8 inches in diameter by $1\frac{1}{4}$ inches face.

The ease with which the Success Emery Grinder can be operated is the wonder of all who use it for the first time. A simple, easy movement of the foot operates a roller ratchet, which sends the emery wheel spinning easily at 3,000 revolutions a minute. The machine screws to the floor and wall and is quickly and easily set up.

This machine is guaranteed to be the most substantial, most mechanically made and best finished in existence.

Each machine is crated for shipment.

List price, complete.....\$10.00



FIG. 1902



FIG. 1903

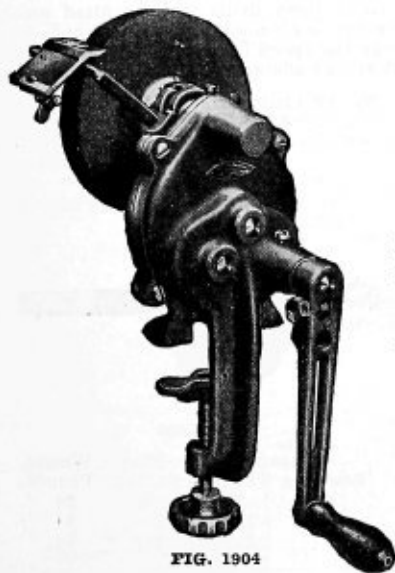


FIG. 1904

MODEL TOOL GRINDERS

MODEL "B"

- | | | | |
|-----|-------|---|--------|
| No. | 0. | For the house. Wheel, 4x1x1 in.
Case diameter, 4½ in. Price, each. | \$3.50 |
| No. | 00. | For carpenter. Wheel, 5x1x1 in.
Case diameter, 6 in. Price, each. | 5.00 |
| No. | 000. | For small repair shop. Wheel, 6x
1x1 in. Case diameter, 7 in. Price,
each | 7.00 |
| No. | 0000. | For machine shop. Wheel, 7x1¼x
1 in. Case diameter, 8 in. Price,
each | 9.50 |

MODEL "C"

- | | | | |
|-----|------|--|--------|
| No. | 0. | With Vitrified Corundum Wheel
4x1 in. Adjustable tool guide.
Price, each | \$2.85 |
| No. | 00. | With Vitrified Corundum Wheel
5x1 in. Adjustable tool guide.
Price, each | 3.70 |
| No. | 000. | With Vitrified Corundum Wheel
6x1 in. Adjustable tool guide.
Price, each | 5.80 |

MODEL "D"

A powerful high speed heavy duty grinder. Meets all requirements of the mechanic.

- | | |
|--------------------------------------|--------|
| Size 0, wheel 4x1x1. Price, each... | \$6.85 |
| Size 00, wheel 5x1x1. Price, each... | 7.70 |
| Size 000, wheel 6x1x1. Price, each.. | 8.20 |
| Size 0000, wheel 7x1¼x1. Price, each | 9.50 |

U. S. ELECTRIC DRILLS

Types B and C

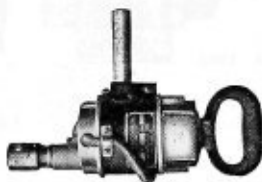


FIG. 1912

Types E, F and G

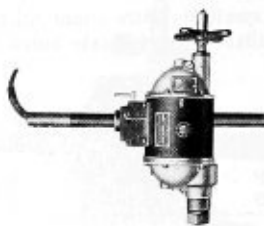


FIG. 1913

Type.....	B	C	D	E	F	G
Voltage	110 or 220	110 or 220	110 or 220	110 or 220	110 or 220	110 or 220
Dimensions.....inches	4x13	4½ x 14	4½ x 16	6 x 16½	6 x 18½	6 x 18½
Size drill will hold ..inches	0 to ¼	0 to ⅜	0 to ½	0 to ¾	0 to 1	0 to 1½
Revolutions per minute...	900	800	450	280	200	180
Weight.....pounds	9	12	16½	31	35	38
Price, direct current ..each	\$60.00	78.00	89.00	116.00	137.00	150.00
Price, alternating current.....each	\$60.00	83.00	93.00	125.00	145.00	170.00

Type D similar to B and C except has two handles and breast plate.

In ordering drills or grinders always specify whether direct or alternating current is desired. The above drills can be run off the ordinary incandescent lamp socket.

RADIAL DRILLS



FIG. 1914

Type.....	EG-110	EG-220	GF-110	GF-220
Voltage	110	220	110	220
Height over all.....in.	36	36	36	36
Height of column.....in.	31	31	31	31
Length of feed.....in.	5	5	5	5
Length of radius arm.....in.	12	12	12	12
Size drill will hold.....in.	0 to ⅞	0 to ⅞	0 to 1¼	0 to 1¼
Revolutions per minute...	240	240	180	180
Weight	145	145	165	165
Price, direct current.....each	190.00	190.00	240.00	240.00
Price, alternat'g cur't.....each	192.00	192.00	245.00	245.00

These drills have rack and pinion adjustment for horizontal arm. Drills have a positive feed and can drill at any angle. Hand wheel on top of motor to knock out twist drill. Ball thrust bearing and taper socket. These drills can be run off the ordinary incandescent lamp socket. Radial arm or vertical column made any length desired. In ordering always specify whether direct or alternating current is desired.

U. S. ELECTRIC DRILLS AND GRINDERS—CONTINUED

Types T and U Drill



FIG. 1915

Type HA Grinder



FIG. 1916

Type.....	T	U	HA
Voltage.....	110 or 220	110 or 220	110 or 220
Dimensions.....inches	6x14	6x15½	6x9
Size drill will hold.....inches	0 to ⅝	0 to ½	
Size of emery wheel.....inches			6x¾x½
Adjustment of feed.....inches			¾
Speed.....revolutions per minute	750	450	3550
Weight.....pounds	17	18½	25
Price, alternating current.....each	\$83.00	93.00	72.00

These tools are made for 60 cycle 1, 2 or 3-phase. State when for other cycles or phases. In ordering always state cycle and phase and voltage.

Type S



FIG. 1917

BENCH DRILLS

Type.....	S
Voltage.....	110 or 220
Spindle to table.....inches	10½
Diameter of table.....inches	12
Travel of spindle.....inches	8
Size drill will hold.....inches	0 to ½
Speed, maximum.....revolutions per minute	950
Speed, minimum.....revolutions per minute	350
Total height.....inches	32½
Weight.....pounds	112
Price, direct current.....each	\$160.00
Price, alternating current.....each	\$160.00

The friction disc drive is arranged to automatically compensate for wear. Speed can be changed by moving the friction driving wheel axially. These tools are especially adapted for small work. Table can be made to tilt to any angle.

In ordering always specify whether direct or alternating current is desired.

U. S. UNIVERSAL MOTOR DRILLS AND GRINDERS



FIG. 1918



FIG. 1919

Type.....	AU	BU	CU	DU	EU
Voltage	110 or 220	110 or 220	110 or 220	110 or 220	110 or 220
Dimensions	3½x9½	3½x11	4½x14	5x18	6x16½
Size drill will hold.....inches	0 to ⅝	0 to ¼	0 to ⅝	0 to ½	0 to ¾
Revolutions per minute...	1400	900	750	450	280
Weight .....pounds	6	7	12	18	28
Price .....each	\$64.00	71.00	88.00	100.00	140.00

In these Drills the motors are universal wound so that the motor will operate on either direct or alternating current of 110 or 220 volts of 25, 30, 40, 50 or 60 cycle, single phase.



FIG. 1920



FIG. 1921

Type.....	HJU	PU
Voltage	110 or 220	110 or 220
Dimensions	5x13	5x14
Size Emery Wheel.....inches	4½x½	4½x½
Horse-power	¼	¼
Speed	5000 r. p. m.	5000
Weight .....pounds	25	24
Price .....each	\$80.00	75.00

The Type HJU Center Grinder is for use on lathe, planer or shaper, for general grinding.

The Type PU is a tool grinder for general grinding of small tools.

These tools are all operated by attaching plug to the lamp socket.

U. S. ELECTRIC GRINDERS

Type H



FIG. 1922

Types JK and M



FIG. 1923

Type	H-110	H-220	JK-110	JK-220	M-110	M-220
Voltage	110	220	110	220	110	220
Dimensions.....inches	5x11	5x11	7½x15½	7½x15½	8½x18½	8½x18½
Size of emery wheel.....inches	4½x1½x½	4½x1½x½	10x1	10x1	12x1½	12x1½
Size of extension mandrel.....inches	1¼x¾	1¼x¾	.....	.....	.....	.....
Travel of grinder.....inches	2¼	2¼	.....	.....	.....	.....
Horse power.....	1	1	1	1	2	2
Revolutions per minute.....	4500	4500	2400	2400	2050	2050
Weight.....pounds	21	21	87	87	120	120
Price, direct current.....each	65.00	\$65.00	140.00	140.00	210.00	210.00
Price, alternating current.....each	72.00	72.00	150.00	150.00	210.00	210.00

One tooth rest, 10 feet of cable and one attachment plug included with each Type H grinder. Types JK and M especially adapted for heavy parallel grinding. Grinder can also be used in lathe, planer, or boring mill. Be sure and specify when grinder is to be used vertical.

Type L

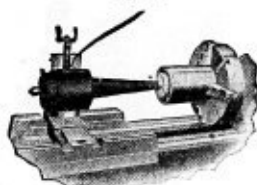


FIG. 1924

Type O



FIG. 1925

Type	L-110	L-220	OB-110	OB-220	O-110	O-220	OO-110	OO-220
Voltage	110	220	110	220	110	220	110	220
Dimensions.....inches	6x25	6x25	5½x21	5½x21	6x30	6x30	7½x32	7½x32
Size of emery wheel.....inches	5x1	5x1	5x¾	5x¾	6x1	6x1	8x1	8x1
Horse power.....	1	1	½	½	½	½	1	1
Revolutions per minute.....	3600	3600	3500	3500	3500	3500	3000	3000
Weight.....pounds	68	68	20	20	48	48	65	65
Price, direct current.....each	150.00	150.00	80.00	80.00	95.00	95.00	128.00	128.00
Price, alternating current.....each	155.00	155.00	80.00	80.00	100.00	100.00	135.00	135.00

Type L is furnished with angle plate and has vertical adjustment. Adapted for finishing air, steam, and gas cylinders. State when grinder is to be used vertical. Type O is for grinding and cleaning castings. Can also be used with a felt wheel for polishing or a sand wheel for grinding. Can be used in close places. In ordering Types L and O always specify whether direct or alternating current is desired.

U. S. ELECTRIC GRINDERS—CONTINUED

Type R



FIG. 1926

Type HB



FIG. 1927

Type J

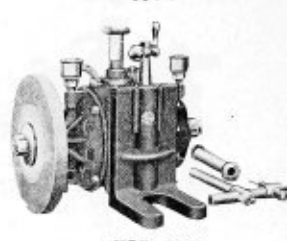


FIG. 1928

Type	R	HB	J
Voltage	110 or 220	110 or 220	110 or 220
Dimensions	4½x8	4x11	6x13
Size emery wheel	6x¾x½	4½x¾x½	8¾x¾
Travel of grinder	.....	.....	3
Horse power	¾	¾	¾
Speed	4500	4500	3000
Weight	13	20	48
Price, direct current	\$54.00	65.00	108.00
Price, alternating current	\$60.00	67.00	115.00

Type R has no slide made for lathes with a compound rest used for grinding centers, reamers, dies and rolls. Type HB is considered the most practical center grinder. Ten feet of cable furnished with this grinder. Type J is for use in lathes, planers or boring mills.

Type RN



FIG. 1929

Type KM



FIG. 1930

Type	KM	RN	NN	NK	NE
Voltage	110 or 220	110 or 220	110 or 220	110 or 220	110 or 220
Dimensions	15x18	.....	.....	.....	.....
Size emery wheel	10x1 & 12x1½	6x¾x½	8x¾x¾	10x1x¾	12x1½x¾
Horse power	1	.....	.....	.....	.....
Speed	2050	3800	3000	2400	2050
Weight	185	14½	45	* 62	105
Price, direct current	\$190.00	60.00	95.00	128.00	195.00
Price, alternating current	\$195.00	65.00	95.00	135.00	200.00

Type N used in connection with spring or balance weight. Adapted for grinding high places off casting or chilled spots. Also carry a felt wheel for polishing or a wire brush.

Type KM bench grinder for general grinding such as tools or light castings; machine can be arranged for buffing spindles; adjustable bearings.

In ordering always specify whether direct or alternating current is desired.

COVER'S AUTOMATIC RUBBER RESPIRATOR

Is designed for the use of persons who are exposed to the danger of inhaling poisonous dust and gases.

Every Fireman, Druggist, Chemist, Polisher, or person engaged in Dust-Making pursuits, or where smoke or fumes are encountered, should have one of these valuable Respirators.

It is provided with a closed and protected Automatic Ventilating VALVE, which operates under all conditions, thus securing perfect ventilation of the Respirator and preventing breathing over and over again of the inhaled air.

The filtering material and its arrangement in the Respirator should be such that the air will be purified while passing through it. A fine damp sponge or a wet silk cloth are reckoned among the best known filtering materials for separating impurities from the air, and when these two valuable filtering materials are combined in their action, as they are in Cover's "Combination" Filter, the protection is complete, and it is a very difficult matter for smoke, fumes and gases to pass the silk cloth in contact with the wet sponge.

No fireman or workman cares to carry around on his face a cumbersome apparatus that is always getting out of order and is often not at hand when most needed, but wants a simple and effective device that can be placed in any ordinary pocket without fear of crushing, and be quickly adjusted to the face.

The Respirator is made of the best Soft White Rubber and is provided with adjustable elastic bands to quickly attach it to the face.

Price per dozen, \$24.00



FIG. 1931

COVER'S RUBBER GOGGLES
AUTOMOBILE SIZE, VENTILATED FOR GENERAL USE

FIG. 1932

Dust Proof, Rain Proof, Sanitary, and the best appearing Goggle on the market. All one piece of rubber, except, of course, the glasses. Fits anybody, and can use lenses of any shape.

Price per dozen, \$18.00

WILLSON SAFETY GLASSES OR GOGGLES

M1 With Head Band



FIG. 1933

Universal Goggles



FIG. 1934

STYLE M1—All features of the regular M1 style shown on preceding page, but made with an elastic head band instead of half-cable temples. M1 is often preferred for certain kinds of work requiring extra security against dust by means of a closer fitting.

Priceper dozen \$8.80

UNIVERSAL GOGGLE—Adapted for plants in which goggle price is an important consideration and where only fair protection is deemed necessary. The above style has wire-screen side shields, easy cable temples and rust-proof construction throughout. Each pair in a neat metal box.

Price, Universal Style, for light work.....per dozen \$4.15

Price, Universal Style (U-S-2), with thick white lenses.....per dozen 4.95

COLORED GOGGLES

FOR FURNACEMEN AND WELDERS

Style A3½



FIG. 1935

STYLE A3½—Same as Albex Eye Protector, but with bi-focal lenses. Cobalt blue, larger upper part protects from intense heat and blinding glare, while uncolored small lower section permits wearer to move about freely. We recommend this style for furnacemen, pourers, etc.

Price to plants, including steel cases.....per dozen \$11.55

STYLE A1½D—Albex Eye Protector with bi-focal lenses for acetylene welding and blowpipe work. This style dispenses with the welder's and grinder's helmet when eye-protection only is sought. Lens construction is the reverse of A3½. Color of large lower section is dark-green smoke while small upper part is uncolored.

Price to plants, including metal cases.....per dozen \$11.55

STYLE A1D—Same as A1½D but with solid color dark-green smoke lenses.

Price to plantsper dozen \$8.50

Temples and other repair parts for above styles at nominal prices.

WILLSON SAFETY GLASSES OR GOGGLES

Style SSG2N With Nose Rest



FIG. 1936

Style M1



FIG. 1937

Style SSG2N Glasses are for persons engaged in extra hazardous work, as extra heavy chipping. They have super-tough ground and polished lenses and nose rest, and safety flanges. Put up in cardboard box.

Price	per dozen	\$11.75
Extra lenses for above	per dozen pairs	5.90
Steel case		.25

Style M1 Goggles are designed for occupations requiring ordinary protection, as light grinding and machine work. Furnished with flat white lenses or curved amber lenses if desired. Amber lenses tint down the glare of sparks and prevent eye strain without reducing the wearer's power of vision.

Price	per dozen	\$8.80
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Each pair in a strong steel case.

Style SG2



FIG. 1938

Style A1

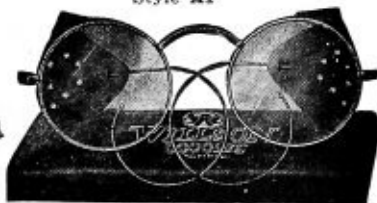


FIG. 1939

Style SG2 Safety Glasses have thick ground and polished lenses for heavy work. Have the safety flange and adjustable bridge brace, same as styles shown above.

Price	per dozen	\$8.80
With nose rest	extra, per dozen	.75
Extra lenses	per dozen pairs	3.70
Steel case for above		.25

Style A1 is a light goggle with leather side shields, has the adjustable brace bridge, and is much used by grinders and machinists because of its light construction. Put up in a strong steel case. Furnished with curved white lenses or curved amber lenses when desired.

Price	per dozen	\$7.45
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Temples and other repair parts for above styles at nominal prices.

"NORKA" GRINDSTONES



FIG. 1940

A very strong and easy running grindstone, practically indestructible. The frame is constructed of heavy tubular steel, thoroughly braced. The shaft is of cold-rolled steel and turns in a splendid ball-bearing device.

The Pitman connection is also ball-bearing. The stone, the really vital feature of the whole outfit, is a Cleveland Grindstone of Genuine Berea or Lake Huron Grit, 19 to 22 inches in diameter, $1\frac{3}{4}$ to $2\frac{1}{4}$ inches thick.

The frame is folded, strongly and compactly crated with the stone.

Price, "Norka" Ball Bearing.....	each, \$7.50
Price, "Norka" Roller Bearing	each, 7.25

"SAMSON" GRINDSTONES

This frame is made of seasoned hardwood. The legs are securely gained into the side pieces and the ends are in one piece. Two bolts at each end pass through the entire frame from side to side. The ends of the side bars are neatly turned to serve as handles.

The "Samson" being strongly braced and bolted, stands absolutely solid. It is one of the strongest and most showy frames made.

The "Samson" is supplied with a "Cleveland Grindstone," either Berea or Lake Huron grit and the regular roller bearings or improved ball bearings.



FIG. 1941

Roller Bearing	Ball Bearing	Weight of Stone	Usual Thickness	Shipping Weight	Roller Bearing, per Doz.	Ball Bearing, per Doz.
No. S. 150	No. S. 150 B	100 to 110 lbs.	$1\frac{3}{4}$ to $2\frac{1}{4}$ in.	150 lbs.	\$72.00	\$78.00
No. S. 155	No. S. 155 B	70 to 80 lbs.	$1\frac{3}{4}$ to $2\frac{1}{4}$ in.	100 lbs.	60.00	66.00
No. S. 160	No. S. 160 B	40 to 50 lbs.	$1\frac{3}{4}$ to $2\frac{1}{4}$ in.	75 lbs.	54.00	60.00

Every frame is provided with treadle, crank and bucket holder. The crank can be used as a wrench to tighten any nut on the frame.

All grindstones shipped knocked down.

"HERCULES" GRINDSTONES



FIG. 1942

This frame is made of seasoned hardwood, with oil and varnish finish, strongly braced in all directions.

Furnished with crank, treadle, water trough and clothes protector.

The "Hercules" was designed with special reference to the railroad and New England trade, where a strong, heavy article is required.

We furnish with all sizes of "Hercules" an extra heavy patent shaft and turned rollers, and use heavy bolts and washers.

All mounted grindstones are turned true to their own axis before mounting. By the use of our patent fixture, we are enabled to detach the shaft and leave the flanges fast to the stone.

When not otherwise ordered, we ship mounted grindstones knocked down. The "Hercules" can be shipped mounted complete, ready for use, or knocked down, as desired.

Size	Diam- eter	Thick- ness	Stone Weights About	Price Bushd Stone Each	Price Frame and Fixtures, Each	Price Complete, Each
H 201	24 x 2		80 lbs.	\$3.00	6.00	8.00
H 202	24 x 3		120 lbs.	4.50	6.00	9.00
H 203	26 x 2½		115 lbs.	4.50	7.00	9.50
H 204	26 x 3		140 lbs.	5.50	7.00	10.00
H 205	28 x 3		165 lbs.	6.00	7.50	11.50
H 206	30 x 2		125 lbs.	5.00	8.50	11.00
H 207	30 x 3		185 lbs.	6.50	8.50	12.00
H 208	32 x 2½		180 lbs.	6.00	9.50	12.00
H 209	34 x 2		160 lbs.	5.50	10.00	12.00
H 210	34 x 3		240 lbs.	8.00	10.00	14.00

WOOD FRAME POWER GRINDSTONE

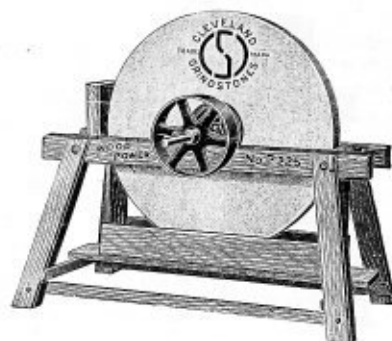


FIG. 1943

These frames are strongly made of seasoned hardwood, braced securely in every direction and firmly bolted together. Fitted with patent detachable fixture, which enables us to ship stone and frame separate and have the stone run true when the shaft is replaced, without any redressing of the stone.

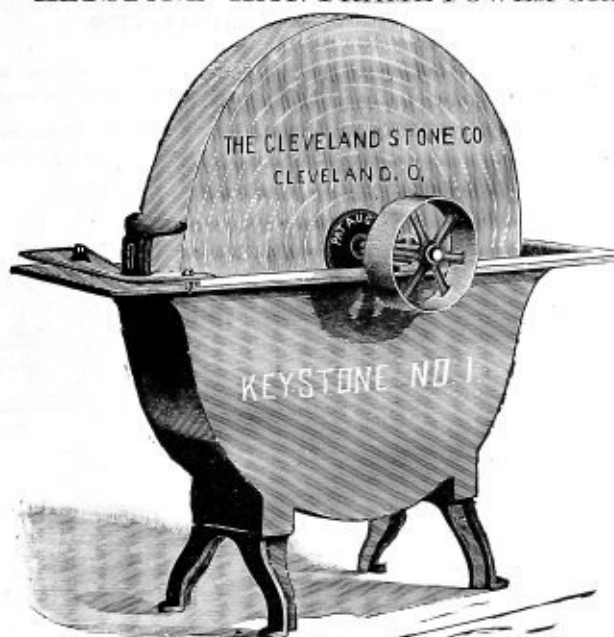
Size	Diameter of Stone	Price of Frame Only	Price of Frame with Fixtures and 12-in. Pulley	Price Complete, Including Stone Fitted with Patent Detachable Fixtures and 12-in. Pulley
P. 220	24 inches	\$ 8.00	\$21.00	24 in. x 3 in. \$23.00
P. 225	30 inches	10.00	23.00	30 in. x 4 in. 28.00
P. 230	36 inches	11.00	25.50	36 in. x 4½ in. 33.00
P. 235	42 inches	12.00	27.00	42 in. x 4½ to 5 in. 38.00
P. 240	48 inches	13.50	33.00	48 in. x 5½ to 6 in. 50.00
P. 245	54 inches	17.50	41.00	54 in. x 6½ to 7 in. 67.00
P. 250	60 inches	24.00	48.00	60 in. x 7½ to 8 in. 84.00

We furnish a 12-inch pulley with all sizes of wood power frames. We will substitute any required size, charging only the actual difference in price.

Special prices for any size stone required.

Nos. 220, 225, 230 and 235 will hang stone 6 inches thick. Nos. 240, 245 and 250 will hang stone 8 inches thick. Shipped mounted on skids; can be knocked down if desired.

"KEYSTONE" IRON FRAME POWER GRINDSTONE



FITTED WITH
DETACHABLE
FIXTURES

Trough is cast
in one piece,
making it water
tight.

An adjustable
tool rest, with
drip pan, fur-
nished with each
frame.

When stone is
worn out, the hub
may be returned
and fitted with
new stone, at a
small extra
charge.

FIG. 1944

Number	Diameter of Stone, Inches	Thickness of Stone, Inches	Size of Shaft at Bearings, Inches	Price Complete With Stone	Price of Frame With Shaft Pulley & Tool Rest	Price of Frame Only Without Shaft, Bearings or Tool Rest
No. 508K	50	7½ to 8	1¾	\$160.00	No. 100K	\$104.00
No. 506K	50	5½ to 6	1¾	140.00		
No. 488K	48	7½ to 8	1¾	150.00		
No. 486K	48	5½ to 6	1½	136.00		
No. 485K	48	4½ to 5	1½	132.00		
No. 466K	46	5½ to 6	1½	134.00	No. 200K	78.00
No. 465K	46	4½ to 5	1½	130.00		
No. 406K	40	5½ to 6	1½	102.00		
No. 405K	40	4½ to 5	1¼	98.00		
No. 386K	38	5½ to 6	1¼	100.00		
No. 385K	38	4½ to 5	1¼	96.00	No. 300K	68.00
No. 366K	36	5½ to 6	1¼	98.00		
No. 365K	36	4½ to 5	1¼	94.00		
No. 364K	36	4 to 4½	1¼	92.00		
No. 305K	30	4½	1	78.00		
No. 304K	30	4	1	76.00	No. 300K	42.00
No. 303K	30	3½	1	74.00		
No. 302K	30	3	1	73.00		

We furnish a 12-inch pulley with all sizes of Keystone frames. We will substitute any required size, charging only the actual difference in price.

Loose pulley, 12 inches in diameter, \$3.00 extra. In ordering, please state nature of work to be done in order proper selection of grindstone may be furnished.

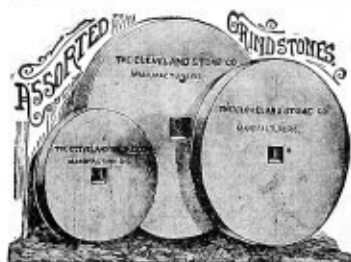


FIG. 1945

GRINDSTONES

Berea medium grit, unmounted without fittings, with square hole cut in center for shaft.

Stones weighing 200 pounds or over are sold by estimated weight, called "measurement weight."

Weight each assorted, lb.	20 to 25	25 to 30	30 to 40	40 to 50	50 to 60	60 to 70
Thickness inches	1½ to 2	1½ to 2	1½ to 2½	1½ to 2½	1½ to 2½	2 to 2½
Diameter	14	15	17	19	21	22
List price per ton	\$60.00	60.00	60.00	50.00	50.00	50.00

Weight each assorted, lb.	70 to 80	80 to 90	90 to 100	100 to 110	110 to 120	120 to 130
Thickness inches	2 to 2½	2 to 3	2 to 3	2 to 3	2 to 3	2 to 3
Diameter	22½	22½	23	23½	25	26
List price per ton	\$50.00	50.00	50.00	50.00	50.00	50.00

GRINDSTONE FIXTURES

Ball Bearing Fixtures

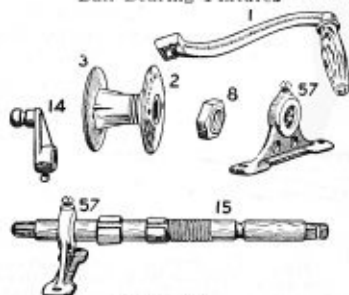


FIG. 1946

BALL BEARING FIXTURES

The shaft may be removed from the stone and replaced at will, and the stone will always run perfectly true.

Roller Bearing Fixtures

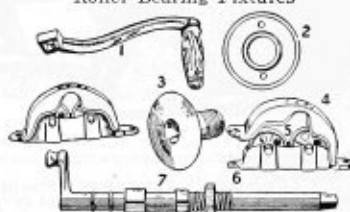


FIG. 1947

	Weight, ounces	Each
No. 15. Shaft and Nut.....	41	\$0.30
Hubs complete, per set.....	25	.20
No. 2. Flanges	10	.05
No. 3. Flange Nipples	15	.15
No. 8. Nuts for Shaft	4	.05
No. 14. Short Crank with Set Screw.....	8	.10
No. 1. Hand Crank	10	.10
No. 57. Bearings with Balls.....	5	.15
Complete Sets		per dozen \$12.00

ROLLER BEARING FIXTURES

All parts are interchangeable. The shaft may be removed from the stone and replaced at will, and the stone will always run perfectly true. Order parts by number.

	Weight, ounces	Each
No. 7. Shaft with Nut.....	41	\$0.25
Hubs, per set.....	25	.20
No. 2. Flanges	10	.05
No. 3. Flange Nipples	15	.15
No. 8. Nuts for Shaft	4	.05
Bearings complete, per set.....	56	.30
No. 1. Crank	10	.10
No. 4. Caps	12	.05
No. 6. Chairs	10	.05
No. 5. Rolls	5	.03
Complete Sets		per dozen \$10.00

WESTERN CHIEF DRILLS

No. 0

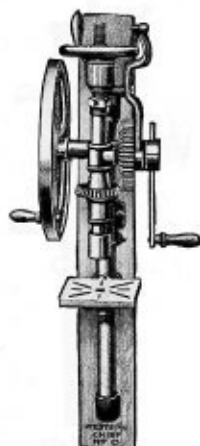


FIG. 1948

No. 1

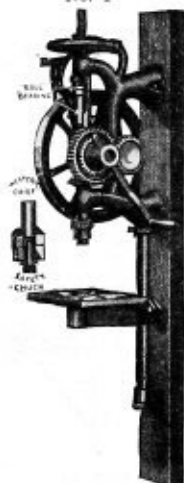


FIG. 1949

No. 3

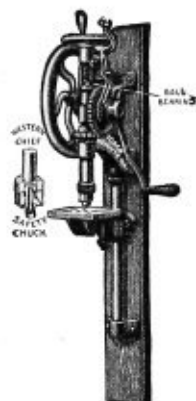


FIG. 1950

No. 0—For light work. Has fast and slow speed. Self-feed, changeable speed.

No. 1—Self-feed, with three different speeds to feed; slow, medium and fast. Double geared for slow or fast speed. Slotted, rotating, swinging table. Quick return.

No. 3—Automatic self-feed.

No.	0	1	3
Size holes will drill.....inches	0 to $\frac{3}{4}$	0 to $1\frac{1}{2}$	0 to 1
Drills to center of circle.....inches	12	15	$14\frac{1}{2}$
Up and down run of spindle.....inches	$2\frac{3}{4}$	$2\frac{3}{4}$	$3\frac{1}{2}$
Up and down run of table.....inches	$9\frac{1}{2}$	13	11
Greatest distance from table to spindle.....inches	$9\frac{1}{2}$	13	$10\frac{1}{2}$
Takes bits with shanks.....inches	$\frac{1}{2}$	$\frac{1}{2}$ or $41/64$	$\frac{1}{2}$ or $41/64$
Size of pulleys for power.....inches	.....	$8 \times 2\frac{1}{8}$	$8 \times 2\frac{1}{8}$
Should run.....R. P. M.	.....	200	200
Weight.....lbs.	75	130	95
Price, Hand Power only.....each	\$18.38	35.50	21.63
Price, Hand and Pulley Power.....each	.....	42.38	28.40

Always state size bits used.

WESTERN CHIEF DRILLS

No. 16.

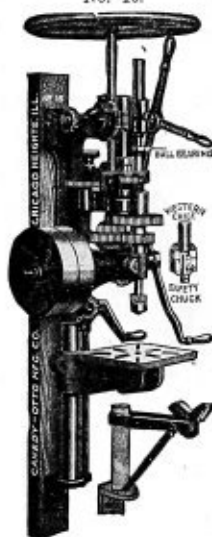


FIG. 1952

No. 12.

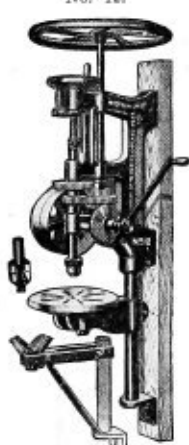


FIG. 1951

No. 19.

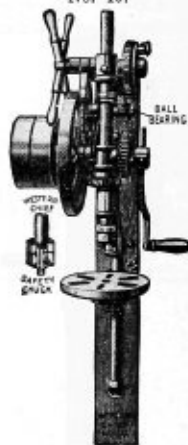


FIG. 1953

No. 12—Cut gears only used, automatic self-feed. Fast and slow speed, instant change. Shaft is left extended to receive pulleys at any time.

Has wheel holder attachment as shown.....extra \$2.00

No. 16—A post drill with fine features of a machine shop floor drill. Cut gears, fast and slow speed, instant change. Hand lever feed, also horizontal gear driven positive self-feed changed to fast, slow or medium speed instantly. These feeds work independently of each other, and bit is raised instantly. Raise and lower device to table—wheel holder attachment.....extra \$2.00

No. 19—For ordinary shop use. Combined hand and self-feed drill.

No.	12	16	19
Size holes will drill.....inches	0 to 1½	0 to 1½	0 to 1¼
Drills to center of circle.....inches	16	24	16½
Up and down run of spindle.....inches	4	6¼	5¼
Up and down run of table.....inches	15½	15½	11
Greatest distance from table to spindle.....inches	16	18½	14
Takes bits with shanks.....inches	½ or 41/64	½ or 41/64	½ or 41/64
Size of pulleys for power.....inches	10¾ x 2½	10¾ x 2½	8 x 2
Should run.....R. P. M.	175 to 180	175 to 180	190 to 200
Weight.....lbs.	215 to 235	340 to 360	130 to 140
Price, hand power only.....each	\$68.25	102.90	41.50
Price, hand and pulley power.....each	75.00	111.25	48.45

Always state size bits used.

No. 16—Electric, same as No. 16 above but with motor. Costs less than 25c a day to operate. No belts, direct connection.

List price, 110 volts, 60 cycle, or 110 volts D. C.....each \$275.00

List price, 220 volts, 60 cycle, or 220 volts D. C.....each 285.00

CHAMPION SELF FEED POST DRILLS

No. 102

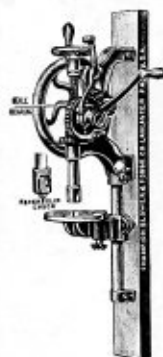


FIG. 1954

No. 98 Self-Feed



FIG. 1955

No. 95

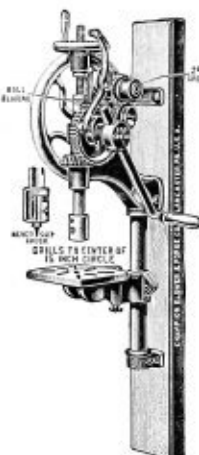


FIG. 1956

No. 97

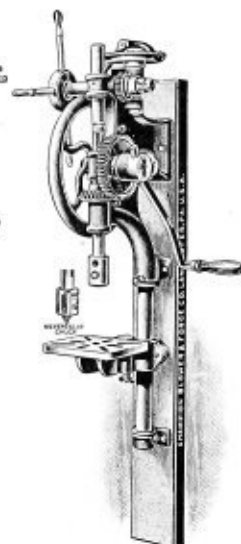


FIG. 1957

Number	102	98	95	97
Size Hole	in. $\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{4}$
Drills to Center of Circle	in. 12	14	15	$16\frac{1}{2}$
Takes Straight Shank Drills	in. $\frac{1}{2}$ *	$\frac{1}{2}$ *	$\frac{1}{2}$ *	$\frac{1}{2}$ *
Diameter of Spindle	in. $\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$
Up and Down Run	in. 3	3	3	$5\frac{1}{2}$
Weight	lbs. 65	95	115	160
Price	each \$6.50	8.00	11.00	18.00
Power Attachment Extra		3.00	3.00	3.00

*If especially ordered, spindle will be bored $\frac{5}{8}$ -inch or $\frac{3}{4}$ -inch hole.

CHAMPION AUTOMATIC SELF-FEED AND DOUBLE COMPOUND LEVER-FEED DRILLS

No. 200 Drill

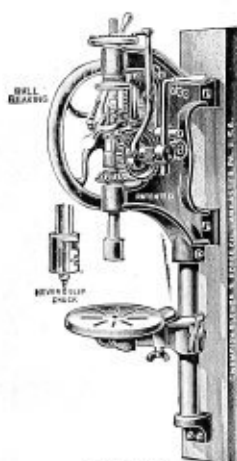


FIG. 1958

No. 203 Drill

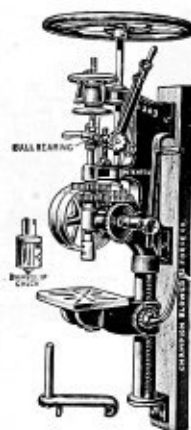


FIG. 1959

These drills all have ball-bearings. The double compound lever-feed with which the drills are equipped produces 80 per cent more pressure, or drills holes 80 per cent larger with the same labor than other lever-feed drills. Three times more work is accomplished in the same time and with less labor, by the increased lever pressure and instantaneous raising of the drill bit out of the hole just bored and again replacing the drill bit back on the material ready to bore the next hole. There is no turning back of the feed screw with either feed.

Number	200	201	203
Size of Hole will Drill.....inches	0 to 1¼	0 to 1½	0 to 1½
Drills to Center of Circle.....inches	16	21	21
Diameter of Spindle .....inches	1¼	1¼	1¼
Bore of Spindle .....inches	½	½	⅝
Run of Spindle Up and Down.....inches	4	5½	5½
Size of Pulley .....inches	6x2	11x2½	11x2½
Weight .....pounds	180	375	400
Price .....each	\$25.00	40.00	50.00
Price, with T. & L. Pulley Power Attachment.....each	28.00	44.00	54.00
Price, with Cone Pulley and Countershaft.....each	.....	.....	65.00

Always specify whether ½ or ⅝-inch drill shanks are wanted.



FIG. 1960

BUFFALO BALL-BEARING LEVER DRILLS

The No. 117 is the simplest drill made. Will handle work to its capacity. Equipped with Buffalo "Suregrip" Chuck, the chuck without a set screw, that requires no tool. Just insert drill bit and turn the chuck collar to the left. A slight turn locks it fast.

The No. 515 is a common sense drill—simple, strong and convenient. It has both automatic and hand feed; by means of a small set screw the automatic feed can be quickly adjusted to slow, medium or fast speed. A quarter turn of lever at top of feed screw changes feed from automatic to lever or back.



FIG. 1961

No.	Maximum Circle	Maximum Hole	Run of Feed	Run of Table	Weight	List Prices	
						Hand and Power	Hand Only
117A	16½ in.	1¼ in.	5½ in.	14 in.	180 lbs.	\$23.00	.....
117	16½ in.	1¼ in.	5½ in.	14 in.	165 lbs.	.....	\$20.00
515A	15 in.	1¼ in.	3 in.	12 in.	140 lbs.	21.00	.....
515	15 in.	1¼ in.	3 in.	12 in.	125 lbs.	.....	18.00

BUFFALO BALL-BEARING DRILLS



FIG. 1962



FIG. 1963



FIG. 1964



FIG. 1965

These are strong, well made self-feed blacksmith drills, with ball bearings at end and thrust of feed screw. Shaft and spindle of polished steel. Automatic feed is adjustable to coarse, medium and fine.

No.	Maximum Circle	Maximum Hole	Run of Feed	Run of Table	Weight	List Prices	
						Hand and Power	Hand Only
619A	19 in.	1½ in.	5 in.	15 in.	220 lbs.	\$24.00	.....
619	19 in.	1½ in.	5 in.	15 in.	200 lbs.	.....	\$20.00
616A	16 in.	1¼ in.	3¼ in.	12 in.	125 lbs.	16.00	.....
616	16 in.	1¼ in.	3¼ in.	12 in.	115 lbs.	.....	13.00
615A	15 in.	1¼ in.	3 in.	12 in.	95 lbs.	13.00	.....
615	15 in.	1¼ in.	3 in.	12 in.	80 lbs.	.....	10.00
611	11 in.	¾ in.	3 in.	9 in.	63 lbs.	.....	7.00

No. 124CE



FIG. 1966

BUFFALO ELECTRIC CAPSTAN LEVER DRILLS

Direct connected to motor; no belt troubles. Slip main gear out of mesh to allow hand operation in case of emergency. Fitted with "Suregrip" Chuck, which locks or releases the bit by turning it half way round by hand. No set screw used.

Please give full particulars about current when ordering. Chuck is bored for bits with $\frac{1}{2}$ -inch straight shank. On special order, also furnished for $\frac{1}{4}$ or $\frac{5}{8}$ -inch without extra charge. Run of feed, 8 inches. Run of table, 20 inches. Drills to center of 24-inch circle.

Height, No. 124CE, 78 inches

Height, No. 124E, 72 inches

No. 124E



FIG. 1967

No.	Maximum Circle	Maximum Hole	Run of Feed	Run of Table	Size of Motor	Weight	List Price
124CE	24 in.	$1\frac{1}{2}$ in.	8 in.	20 in.	$\frac{1}{2}$ H. P.	670 lbs.	\$190.00
124E	24 in.	$1\frac{1}{2}$ in.	$7\frac{1}{2}$ in.	20 in.	$\frac{1}{2}$ H. P.	460 lbs.	171.00

No. 121A



FIG. 1968

BUFFALO CAPSTAN LEVER DRILLS

Multi-Compound Lever Feed—This exclusive "Buffalo" feature is obtained by the strong and simple rack on feed head, operated by the four-arm lever. By maintaining a light pressure on the latter, the bit is forced through the metal with maximum speed, resulting in a great saving of time. It not only gives a leverage never exceeded in any other blacksmith drill, but is also greatly superior in strength and durability.

No. 118



FIG. 1969

No.	Maximum Circle	Maximum Hole	Run of Feed	Run of Table	Weight	List Prices	
						Hand and Power	Hand Only
124A	24 in.	$1\frac{1}{2}$ in.	$7\frac{1}{2}$ in.	20 in.	390 lbs.	\$54.00	.....
124	24 in.	$1\frac{1}{2}$ in.	$7\frac{1}{2}$ in.	20 in.	370 lbs.	.....	\$50.00
121A	21 in.	$1\frac{1}{2}$ in.	$7\frac{1}{4}$ in.	17 in.	330 lbs.	46.00	.....
121	21 in.	$1\frac{1}{2}$ in.	$7\frac{1}{4}$ in.	17 in.	310 lbs.	.....	42.00
118A	18 in.	$1\frac{1}{2}$ in.	$5\frac{1}{2}$ in.	17 in.	300 lbs.	40.00	.....
118	18 in.	$1\frac{1}{2}$ in.	$5\frac{1}{2}$ in.	17 in.	280 lbs.	.....	36.00
116A	16 in.	$1\frac{1}{2}$ in.	$5\frac{1}{2}$ in.	15 in.	270 lbs.	36.00	.....
116	16 in.	$1\frac{1}{2}$ in.	$5\frac{1}{2}$ in.	15 in.	250 lbs.	.....	32.00

WESTERN CHIEF ELECTRIC DRILL No. 17

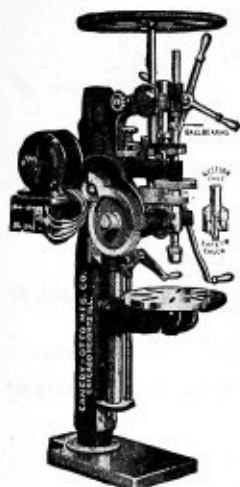


FIG. 1970

Special wheel-holder attachment can be furnished for \$5.50 net.

List price each \$325.00

No. 17. Drill, same as above but with hand and pulley power only.....\$143.87

A finished Floor Drill, equipped with a high-class powerful motor of the best make, costing less than 25c a day to operate. There are no belts, the motor being directly connected with spur gear drive.

Straight and bevel gears are cut.

Fast and slow speed, instant change.

Hand lever feed, also horizontal gear-driven positive self-feed, changed to fast, slow or medium speed instantly. These feeds work independently of each other and bit is lifted quickly.

Raise and lower device to table.

Drills to center of 24-inch circle.

Bores 0 to 1½ inches.

Up and down run of spindle, 6¾ inches.

Up and down run of table, 15½ inches.

Greatest distance from table to spindle, 18½ inches.

Height of machine, 71 inches.

Floor space, 15 x 26 inches.

Spindle bored for ½ or 41/64-inch shank bits. Always state size when ordering. When specially ordered we will bore spindle to receive No. 3 Morse taper.

Weight, 500 pounds.

Wheel rims can be drilled by removing table and using the forked support as a wheel-holder.

WESTERN CHIEF SENSITIVE BENCH DRILL No. 28

For Light and Rapid Drilling.

Drills to the center of a 9-inch circle.

Bores 0 to ½ inch.

Vertical traverse of spindle, 3¾ inches.

Vertical traverse of table, 8 inches.

Greatest distance from table to spindle, 8 inches.

Diameter of column, 2½ inches.

Size of tight and loose pulleys, 4 x 1½ inches.

Should run 650 revolutions per minute.

Size of large cone pulley, 4¾ x 1½ inches.

Size of small cone pulley, 3 x 1½ inches.

Spindle is fitted with holes for drills having No. 1 taper shanks.

Height, 32 inches.

Weight, 85 pounds.

List price..... each \$38.33



FIG. 1971

WESTERN CHIEF SENSITIVE FLOOR DRILLS FOR LIGHT AND RAPID DRILLING

NO. 26 DRILL

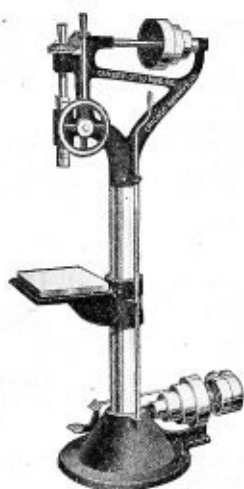


FIG. 1972

- Height of Drill, 65 inches.
- Distance from Spindle to base, 47 inches.
- Diameter of Column, $4\frac{1}{4}$ inches.
- Diameter of Spindle, $1\frac{1}{16}$ inches.
- Travel of Spindle, $7\frac{1}{2}$ inches.
- Hole in Spindle, Morse taper No. 2.
- Size of Table, 11x13 inches.
- Maximum Distance from Spindle to Table, 31 inches.
- Diameter of large Pulley on Cone, 8 inches.
- Diameter of small Pulley on Cone, $3\frac{1}{2}$ inches.
- Belt on Cone, $1\frac{1}{2}$ inch.
- Drills 0 to $\frac{3}{4}$ -inch holes.
- Net weight, 350 lbs.

List Price\$113.33

NO. 27 DRILL

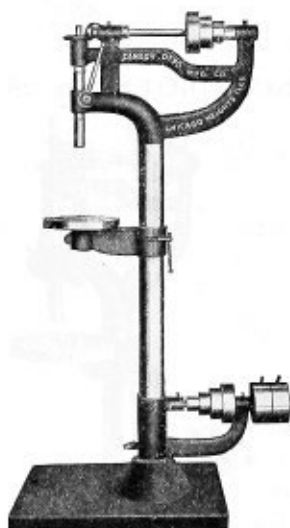


FIG. 1973

- Drills to center of 16-inch circle.
- Bores, 0 to $\frac{11}{16}$ inch.
- Vertical traverse of Spindle, 4 inches.
- Vertical traverse of Table, 2 feet $8\frac{1}{2}$ inches.
- Greatest distance from Table to Spindle, 2 feet 7 inches.
- Diameter of Column, $3\frac{1}{2}$ inches.
- Size of tight and loose Pulley, $6 \times 2\frac{1}{2}$ inches.
- Size of large Cone Pulley, $4\frac{3}{4} \times 1\frac{3}{4}$ inches.
- Size of second Cone Pulley, $4\frac{1}{2} \times 2\frac{3}{4}$ inches.
- Size of Third Cone Pulley, $3\frac{1}{4} \times 2\frac{3}{4}$ inches.
- Size of small Cone Pulley, $2 \times 2\frac{3}{4}$ inches.
- Spindle is fitted with holes for drills having No. 2 taper shanks.
- Height, 66 inches.
- Net weight, 210 pounds.

List Price\$78.33

CANEDY-OTTO POWER DRILLS

NEW AND IMPROVED 20-INCH TYPE MODEL

No. 35

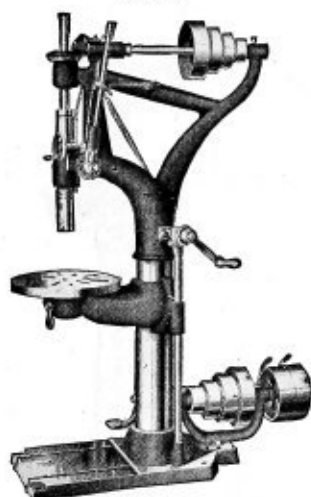


FIG. 1974

No. 36. Back Geared

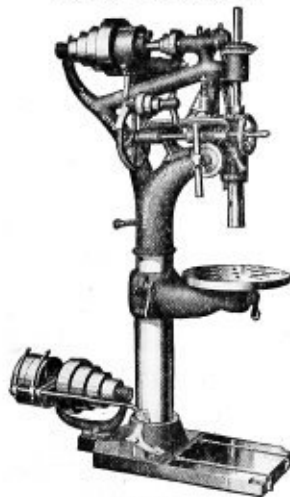


FIG. 1975

Equipped for hand lever feed; also furnished with wheel and lever attachment (as illustrated) when so ordered. This is a valuable machine for all-around work. All parts are solid, simple and compact. The best of material and workmanship used throughout.

All machines tested before leaving the factory and guaranteed in every respect.

DESCRIPTION

Height of drill, 72 inches.
 Greatest distance between base and spindle, 37 inches.
 Greatest distance between table and spindle, 25 inches.
 Travel of spindle, 9 inches.
 Diameter of spindle in sleeve, $1\frac{1}{8}$ inches.
 Spindle socket, No. 3 Morse.
 Drills to center of 21-inch circle.
 Diameter of table, 16 inches.
 Diameter of column, $5\frac{1}{2}$ inches.
 Travel of table on column, 17 inches.
 Size of cone pulleys, $8\frac{3}{4}$, $7\frac{1}{4}$, 5%, $4 \times 2\frac{1}{4}$ -inch face.
 Diameter of tight and loose pulleys, $8 \times 2\frac{1}{2}$ -inch face.
 Speed of countershaft, about 380 R. P. M.
 Net weight, 590 pounds.

No. 35. List price.....each \$160.00

No. 36. Same as No. 35, but has back gear, power feed and automatic stop.
 Can be furnished with tapping attachment at a nominal charge.

List priceeach \$223.33

DEMCO HIGH SPEED BALL BEARING DRILLING MACHINES

No. 22 Bench Drill

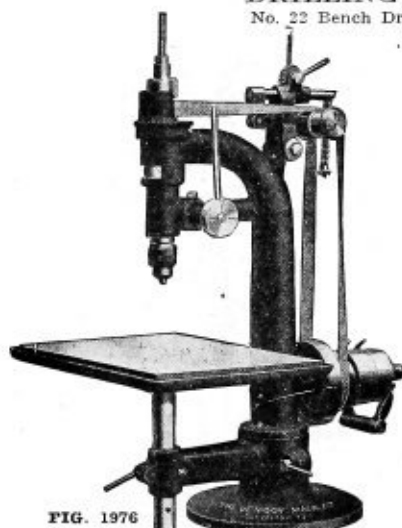


FIG. 1976

No. 23 Floor Drill

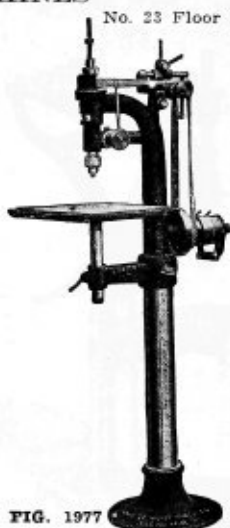


FIG. 1977

In drilling small holes it is necessary to have drill running at an extremely high speed, to enable drill to cut through material instead of being forced through. This not only increases production, but reduces breakage of drills to a minimum.

The Demco is built "all ball-bearing" for drilling holes, using twist drills $\frac{1}{8}$ -inch and under, at a maximum speed of 12,000 R. P. M. Larger holes up to $\frac{3}{8}$ -inch may be drilled at slower speeds. Three speed ranges are provided on machine.

Each spindle is fitted with a carefully balanced three-jawed, geared nut chuck, Key Type.

For changing speeds, a simple operation by moving lever on sector which fits into rack, allowing change to be made quickly. Two pulleys running on ball-bearings are attached to IDLER with belt adjuster having an automatic takeup. BELT: flat, endless, canvas, which gives great flexibility for the high speed it is required to travel.

SPECIFICATIONS

Bench Number	22	23
Spindle Center to Column.....inches	7 $\frac{1}{2}$	7
Traverse of Spindle	4	4
Traverse of Table	7	7
Traverse of Table Arm.....inches	..	25
Maximum Distance Chuck to Table.....inches	8 $\frac{3}{4}$	..
Minimum Distance Chuck to Table.....inches	1	1
Diameter Working Surface of Table.....inches	12 $\frac{1}{2}$	12 $\frac{1}{2}$
Diameter of Table Outside Oil Groove.....inches	14	14
Diameter of Spindle	$\frac{1}{2}$	$\frac{1}{2}$
Diameter of Spindle Pulley.....inches	1 $\frac{1}{2}$	1 $\frac{1}{2}$
Diameter of Countershaft Cone Pulley.....inches	3, 4 $\frac{1}{2}$, 6	3, 4 $\frac{1}{2}$, 6
Diameter of Driving Pulley	4	4
Maximum Spindle Speed	12,000	12,000
Maximum Countershaft Speed	3,000	3,000
Weight	135	200
Height of Machine	34	65

Above furnished with round or oblong table.

CANEDY-OTTO WALL OR POST RADIAL DRILLS

NEW AND IMPROVED 2½ AND 3½ FEET MODELS

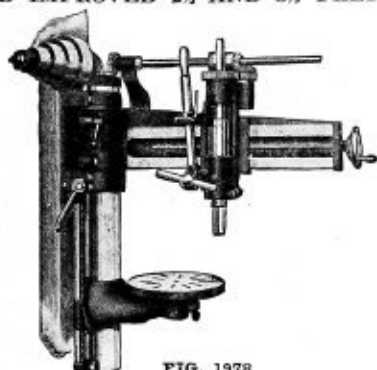


FIG. 1978

Model No. 50 is equipped for hand lever feed only.

These are very valuable machines for all-around work. All parts are solid, simple and compact. The best of material and workmanship used throughout.

All machines are tested before leaving the factory, and guaranteed in every respect.

It is an admitted fact that the radial drill is the only complete drilling machine, and can be used where the stationary spindle type cannot. This is especially true in garages, bridge, boiler, machine and blacksmith shops, or any place where a wide range of drilling is done.

SPECIFICATIONS

The arm can be swung against the wall and securely tightened in any position.

These drills are driven by four-step cone countershafts (with self-oiling bearings) which should be attached to the ceiling.

The spindle head can be traversed along the arm by means of hand wheel screw and can be firmly clamped in any position.

The spindle has a quick return hand lever, in addition to the regular hand feed lever.

Height of drill, 56".

Drills to center of circle outside of column, 64" with 2½' arm, or 84" with 3½' arm.

Greatest distance of center of spindle to column, 32" with 2½' arm, or 42" with 3½' arm.

Smallest distance of center of spindle to column, 7".

Greatest distance of spindle to table, 18".

Traverse of spindle up and down, 9".

Diameter of spindle inside of sleeve, 1⅞".

Diameter of column, 5⅝".

Size of cone pulleys, 8⅞, 7¼, 5⅝, 4 x 2¾" face.

Diameter of tight and loose pulleys, 8 x 2½" face.

Speed of countershaft, about 380 R. P. M.

1½ H. P. required to operate.

Net weight, No. 50, 800 pounds.

Spindle, No. 3 Morse, will carry 1¼" drill.

Equipped with all necessary gear guards (not illustrated). Four-step countershafts furnished as part of regular equipment. Posts not furnished with these drills.

No. 50. 2½-foot arm. List price.....each \$260.00

No. 50. 3½-foot arm. List price.....each 280.00

No. 51. Same as No. 50, but has power feed and automatic stop.

Self-feed has 4 speeds driven by four-step cone. Can be conveniently changed by means of sliding collar.

No. 51. 2½ foot arm. List price.....each 360.00

No. 51. 3½-foot arm. List price.....each 383.33

CANEDY-OTTO No. 101 RADIAL DRILL

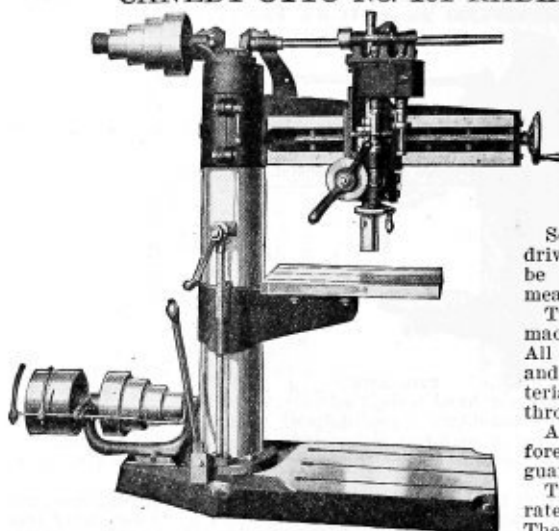


FIG. 1979

Model No. 100 is equipped for hand lever feed only.

The spindle has a quick return hand lever, in addition to the regular hand feed lever on No. 100.

Model No. 101 has power feed and automatic stop.

Self-feed has four speeds driven by four-step cone. Can be conveniently changed by means of sliding collar.

These are very valuable machines for all-around work. All parts are strong, simple and compact. The best of material and workmanship used throughout.

All machines are tested before leaving the factory, and guaranteed in every respect.

These drills are very accurate and powerful machines. They embody many exclusive and extremely valuable fea-

tures and are particularly adapted for work in shops where a radial drill is a necessity, but the price has been prohibitive.

The arm can be swung to any degree within a half circle and can be securely clamped.

The spindle head can be traversed along the arm by means of hand wheel screw, and can be firmly clamped in any position.

SPECIFICATIONS.

	2½ ft.	3½ ft.		2½ ft.	3½ ft.
Height of drill to top of spindle	72 in.	72 in.	Length of base from column	33 in.	45 in.
Floor to top of column ..	64 in.	64 in.	Width of top of base ..	22 in.	22 in.
Drills to center of circle outside of column ..	64 in.	84 in.	Distance from column to end of table ..	26 in.	26 in.
Greatest distance center of spindle to column ..	32 in.	42 in.	Greatest distance between spindle and base ..	36 in.	36 in.
Shortest distance center of spindle to column ..	7 in.	7 in.	Shortest distance between spindle and base ..	27 in.	27 in.
Vertical traverse of spindle	9 in.	9 in.	Greatest distance between spindle and table ..	23½ in.	23½ in.
Diameter of spindle inside of sleeve	1½ in.	1½ in.	Shortest distance between spindle and table ..	4 in.	4 in.
Diameter of column in arm	5½ in.	5½ in.	Thickness of base ..	4 in.	4 in.
Diameter of column below arm	7½ in.	7½ in.	Floor space required ..	24x68	24x80
Size of cone pulley 8%, 7½, 5%, 4x2¾ in. face ..	same	same	Net weight No. 100 ..	1730 lbs.	1930 lbs.
Diameter of tight and loose pulleys, 9x3 ..	same	same	Net weight No. 101 ..	1800 lbs.	2000 lbs.
Speed of countershaft ..	380 R. P. M.		Crated wght. No. 100 ..	1930 lbs.	2130 lbs.
			Crated wght. No. 101 ..	2000 lbs.	2200 lbs.

Spindle No. 3 Morse taper will carry 1¼ drill.

1½ H. P. required to operate.
Size of table. 16x24.

CANEDY-OTTO 16-INCH SCREW CUTTING ENGINE LATHE

CAN BE FURNISHED WITH 8 OR 10-FOOT BED WHEN DESIRED

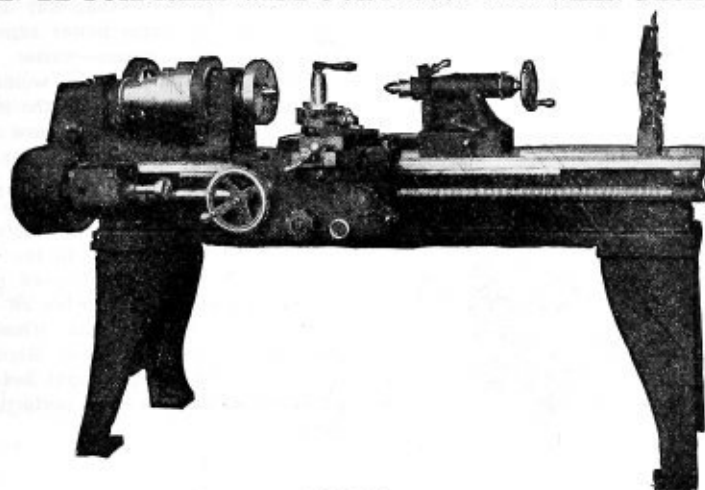


FIG. 1980

Workmanship and materials are the best and built for service.

Every lathe is thoroughly tested before shipping.

Spindle is made of 50 point carbon steel, accurately ground. It runs in best quality bronze bearings.

Carriages are gibbed both front and back; all plain bearings are scraped to surface plates.

Apron is made for heavy duty; all gears are of wide face and accurately cut.

Gear box is of the quick change type and is designed to combine strength with simplicity.

Three quick changes of feed are obtained.

Regular equipment includes large and small face plates, compound rest, follower rest, steady rest, two steel centers, change gears for screw cutting, necessary wrenches and double friction countershaft.

SPECIFICATIONS

Swing over bed	16½"	Length of carriage bearing on bed	18½"
Swing over carriage	11¼"	Ratio of back gears	7.25 to 1
Front bearing	2¾" x 4"	Countershaft pulleys	10" x 3½"
Back bearing	1½" x 3"	Speed of countershaft	125 R. P. M.
Width of belt (4 step cone)	2½"	Length of bed	6¼'
Hole through spindle	1½"	Distance between centers 6 ft. bed ..	.40"
Cutting tool size	5/8" x 1¼"	Weight, net	1,600 lbs.
Diameter nose of spindle	2¾"	Cross feed screw graduated to thou-	sandths.
Diameter tailstock of spindle	1¾"		

On 8 ft. bed distance between center is 66". Weight of 8 ft., 1,745 lbs.

Furnished in following sizes:

- 14" x 6' or 8' bed.
- 16" x 6'—8' or 10' bed.
- 18" x 6'—8' or 10' bed.

BUFFALO NO. 200 SILENT BLOWER



FIG. 1981

The 14-inch fan gives 22 per cent higher blast pressure than any 12-inch blower, with the same power expended. Think what this means—easier work, quicker work, and stronger welds, because scaling or oxidation of the iron is prevented by the high pressure. The 16-inch fan gives 63 per cent higher blast pressure than the 14-inch.

Dust and leak-proof gear case. All end thrust balanced on adjustable ball bearings. Fan shaft runs in the finest radial ball bearings. High-speed pinion runs in bath of oil, lubricating all other working parts by splashing. One-piece gear case insures permanent alignment of gears. Extra long journal bearings. Perfection of parts insures perfection of blower.

	Size of Fan	Weight Complete	List Price
No. 200	14 in.	155 lbs.	\$37.00
No. 200	16 in.	157 lbs.	48.00

CHAMPION NO. 400 BLACKSMITH BLOWER



FIG. 1982

The general construction of the No. 400 blower head used in connection with the above blowers and forges is the finest and highest grade that can be secured by the use of phosphor bronze and tool steel. It is supplied with high speed spiral gearing and adjustable ball bearings made of the finest grade tool steel.

The 400 Champion Steel Blacksmith Blower with the No. 400 Champion Whirlwind Blast Anti-Clinker Heavy Nest Tuyere Iron. Fan 12 inches in diameter; complete with piping; blower weight, 105 pounds; Tuyere iron, 50 pounds.

Each \$37.00

This Blower is made for right or left-hand fires. Right hand blowers furnished unless otherwise specified.

LEADER BENCH FORGES

FOR PROSPECTORS, GARAGES, ETC.

Blower, $7\frac{1}{2}$ inches; hearth, 18 inches; height, $12\frac{1}{2}$ inches. Capacity to heat 1-inch Iron. Can be packed in box, $19 \times 19 \times 14$ inches.

List Price, No. 13, with Shield, weight, 65 lbs.....\$17.25

List Price, No. 14, with Half-hood, weight, 70 lbs.....\$19.25

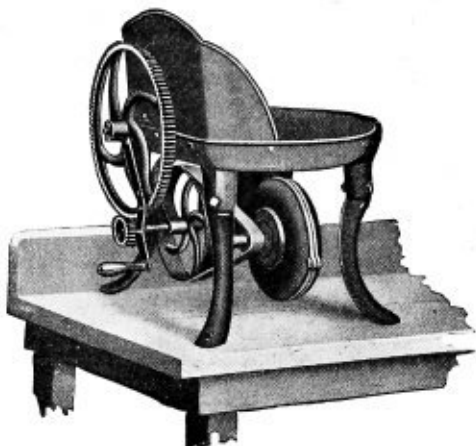


FIG. 1983

CHAMPION BENCH CRANK FORGE

No. 21. With Shield

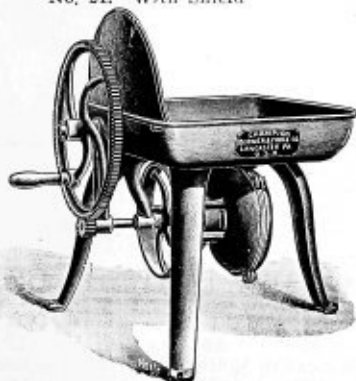


FIG. 1984

For Light Work; Compact and Easily Moved, Having Short Legs; Will Produce a Welding Heat on 1-inch Iron in Ten Minutes.

No. 21 — Champion Bench Crank Forge with Shield, Hearth, 14×17 inches; Fan, 7 inches; Weight, 45 lbs.

Each\$16.00

CHAMPION NO. 401 STEEL RIVET FORGE



FIG. 1985

No. 401 Champion Steel Rivet Forge is used by the great majority of railroads, bridge builders, boiler and structural iron workers of the world. Constructed from structural steel, making it strong and durable. Its gearing is the 400 Champion "Patented" high-speed spiral gearing. It runs noiseless. Highest grade adjustable ball bearings. It is quickly taken apart and assembled. Produces blasts to weld $3\frac{1}{2}$ to 4-inch iron in ten minutes. Crank turns either way.

- No. 401 Champion Steel Rivet Forge with Shield. Hearth, 18 inches in diameter; height, 30 inches; fan, 9 inches in diameter; weight, 115 poundseach \$35.00
- No. 401½ Champion Steel Forge with Shield. Hearth, 22 inches in diameter; fan, 9 inches in diameter; weight, 120 pounds.....each 40.00
- No. 402—Same as No. 401, except has half hood. Weight, 120 lbs.....each 38.00

BUFFALO STEEL PLATE RIVET FORGE

The Buffalo 200 Silent Blower in this forge has helical high-speed gears and full-size, 12-inch fan of the most efficient design, with blast delivery along the line of least resistance. Due to the high mechanical efficiency of the helical gears—nearly double that of other types—they last twice as long and run much easier.

The fire pan is made of heavy, rolled steel plate, strongly riveted. The windshield and blower are detachable and can be packed in the fire pan for transportation. A heavy, round tuyere plate distributes the blast so as to insure the best results in heating.

The No. 210-H Rivet Forge is fitted with a half hood for indoor work. It is specially adapted for all kinds of indoor riveting, tempering, bicycle and auto repairing, etc. The ease and rapidity with which it can be taken down and assembled, and the small space it occupies knocked down, make it a particularly desirable forge to move from place to place.



FIG. 1986

Specifications.....	No. 210	No. 211	No. 212	No. 210H	No. 211H	No. 212H
Size of Hearth .....in.	18	22	24	18	22	24
Size of Fan .....in.	12	12	12	12	12	12
Equipped with.....	Windsh'd	Windsh'd	Windsh'd	½ Hood	½ Hood	½ Hood
Weight .....lbs.	115	125	135	125	135	145
List Price	\$35.00	38.00	41.00	38.00	43.00	45.00

BUFFALO SPIRAL GEARED RIVET FORGES



FIG. 1987

Made with adjustable ball bearings.

Light, yet strong and practically indestructible, the blast supplied by the 300 blower is distributed through a special tuyere plate, designed to spread it sufficiently to give a wide area working fire. The rivet heating capacity of the forge is remarkable.

For railroads, bridge builders, boiler makers, ship builders, structural iron workers and machine shops.

Specifications..	No. 310	No. 311	No. 312	No. 310-H	No. 311-H	No. 312-H
Size of Hearth	18 in.	22 in.	24 in.	18 in.	22 in.	24 in.
Size of Blower	9 $\frac{3}{4}$	9 $\frac{3}{4}$	9 $\frac{3}{4}$	9 $\frac{3}{4}$	9 $\frac{3}{4}$	9 $\frac{3}{4}$
Equipped with	Windsh'd	Windsh'd	Windsh'd	$\frac{1}{2}$ Hood	$\frac{1}{2}$ Hood	$\frac{1}{2}$ Hood
Weight	120 lbs.	130 lbs.	140 lbs.	130 lbs.	140 lbs.	150 lbs.
List Price	\$35.00	\$38.00	\$41.00	\$38.00	\$43.00	\$45.00

BUFFALO ELECTRIC STEEL PLATE FORGES

No. 810

These Forges are equipped with special electric blower, wire and plug. Simply screw plug into lamp socket to connect.

The motor can be either of the constant speed type or variable speed. Please state your preference when ordering, and give full particulars as to character of current.



FIG. 1988

No. 833-H



FIG. 1989

Specifications.....	No. 810	No. 811	No. 812	No. 830-H	No. 831-H	No. 832-H	No. 833-H
Size of Hearth...	18 in.	22 in.	24 in.	24x24	30x30	30x36	30x40
No. of Blower....	2E	2E	2E	2E	2E	2E	2E
Equipped with...	Dash	Dash	Dash	$\frac{1}{2}$ Hood	$\frac{1}{2}$ Hood	$\frac{1}{2}$ Hood	$\frac{1}{2}$ Hood
Weight .....lbs.	105	115	125	185	225	235	255
List Price	\$44.00	\$46.00	\$48.00	\$51.00	\$57.00	\$60.00	\$63.00

NOTE: Add \$3.00 to list if water tank is wanted.

BUFFALO AGRICULTURAL FORGE



FIG. 1990

This Forge has half-hood. These forges are equipped with the Buffalo Climax Blower, with full size 12-inch fan. The hearth is a strong and sound, bowl-shaped casting, supported by four tube-steel legs, rigidly braced. The tuyere plate is round and perforated to give an even spread of blast.

No.	Diam. of Hearth In.	Diam. of Fan In.	Type Hood	Height In.	Shipping Weight Lbs.	Price List
722	22	12	Windshield	30	110	\$27.00
722H	22	12	Half Hood	30	115	30.00

CHAMPION AGRICULTURAL FORGE



FIG. 1991



FIG. 1992

Nos. 152 and 153 Crank Forges are especially adapted for farmers' use or light repairing work of any kind.

Number	152	153
Size of Hearth	18	18
Height	30	30
Diameter of Fan	8	8
Weight	75	80
Price, with Shield	14.00	.....
Price, with Half Hood .....	.....	16.00

CHAMPION LANCASTER GEARED AGRICULTURAL FORGES

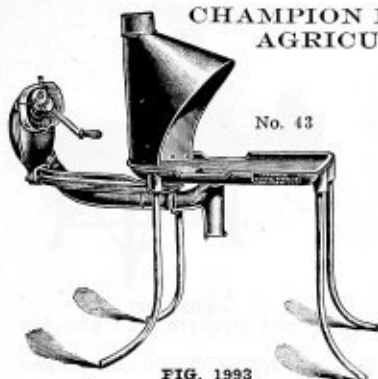


FIG. 1993



FIG. 1994

The Champion Lancaster Geared Agricultural Forges are well built, low priced, and direct drive, making good blast-producers, and are recommended for farmers' use. All gears are supplied with bushed journal bearings, built to run smooth and noiseless. All gears run in dust-proof cases, and the crank turns either direction to produce the blast.

- No. 42—Champion Lancaster Geared Direct-drive Agricultural Forge, hearth, 23x35 inches; height, 30 inches; fan, 12 inches; with shield; weight, 165 poundseach, \$36.00
- No. 43—Champion Lancaster Geared Direct-drive Agricultural Forge, hearth, 23x35 inches; height, 30 inches; with half hood; weight, 170 poundseach, 40.00
- No. 45—Champion Lancaster Geared Direct-drive Agricultural Forge; hearth, 22 inches in diameter; fan, 10 inches; with shield; weight, 115 poundseach, 27.00
- No. 46—Champion Lancaster Geared Direct-drive Agricultural Forge; size of hearth, 22 inches; diameter of fan, 10 inches; with half hook; weight, 120 poundseach, 30.00



FIG. 1995



FIG. 1996

Reinforced stamped steel legs, stamped steel bowl and half hood. Ball bearing throughout. Spiral gearing and whirlwind blast tuyere iron. Blast is produced by turning crank in either direction. Blast is powerful enough for all kinds of light and heavy blacksmiths' work.

- No. 404, Champion Rivet Forge. Same construction of blower and fan as No. 401. Height to top of hearth, 30 inches; fan, 9 inches; hearth, 24x24 inches; weight, 170 lbs.
Each\$45.00

- No. 408—Champion Horse Shoers' Forge. Height to top of hearth, 30 inches; fan, 12 inches; steel sides, 6 inches; hearth, 30x36 inches; weight, 300 pounds.
Each\$65.00

BUFFALO STEEL PLATE FORGES

These forges are equipped with the 14-inch Buffalo Silent Blower, with heavy-duty "Vulcan" tuyere iron.

No. 230 is for heavy work by contractors, railroads, tank and boiler makers, bridge builders, miners, etc.

No. 230-H is a strong forge for jewelers, tool makers, bicycle repairers, and others desiring a strong forge.

No. 231 is for medium heavy work of boiler makers, contractors, miners, railroads, etc. Has hinged automatic ash gate.

No. 231-H is suitable for machine shops, repair shops, quarries, mines, etc. Has hinged ash gate.

No. 232 Horseshoers' Forge combines lightness and strength, and also has hinged ash gate.

No. 233-H Blacksmiths' Forge combines lightness with strength, and is also provided with hinged ash gate.



FIG. 1997

Specifications..	No. 230	No. 230-H	No. 231	No. 231-H	No. 232-H	No. 233-H
Size of Hearth	24x24	24x24	30x30	30x30	30x36	30x40
Size of Blower	14 in.	14 in.	14 in.	14 in.	14 in.	14 in.
Equipped with	Dash	½ Hood	Dash	½ Hood	½ Hood	½ Hood
Weight	210 lbs.	215 lbs.	250 lbs.	260 lbs.	300 lbs.	312 lbs.
List Price	\$45.00	\$50.00	\$55.00	\$60.00	\$65.00	\$70.00

BUFFALO ELECTRIC CAST IRON FORGES

No. 843-H

No. 849-H



FIG. 1998



FIG. 1999

These Forges are equipped with special electric blower, wire and plug.

When ordering, please give full particulars about current, and state preference for Variable or Constant Speed Blower. The former is furnished with six-speed regulator, the latter with blast gate, giving equally close regulation of the blast or fire.

Specifications..	No. 840-H	No. 843-H	No. 844-H	No. 847-H	No. 848-H	No. 849-H
Size of Hearth	23x30	28x40	31x44	32x45	38x42	38x42
No. of Blower	2E	2E	2E	2E	2EH	2EH
Equipped with	½ Hood	½ Hood	½ Hood	½ Hood	½ Hood	½ Hood
Weight ...lbs.	200	310	325	365	560	590
List Price ...	\$45.00	\$50.00	\$51.00	\$56.00	\$82.00	\$89.00

NOTE: Add \$3.00 to list if water tank is wanted.

BUFFALO CAST IRON FORGES

No. 240-H



FIG. 2000

No. 247-H



FIG. 2001

No. 651 is a popular medium size forge for garage, machine and plumbing shops. Has 12-inch Buffalo Silent Blower and hinged ash gate.

No. 228 Blacksmiths' Forge has 14-inch Buffalo Silent Blower. Takes heaviest iron up to 12 inches long in one heat. Has hinged ash gate.

No.	Size of Hearth	Size of Blower	Weight	LIST PRICES	
				With Tank	Without Tank
240-H	23x30 in.	12 in.	205 lbs.	\$44.00	\$40.00
247-H	32x45 in.	14 in.	375 lbs.	63.00	59.00

BUFFALO CAST IRON FORGES

No. 243-H



FIG. 2002

No. 248-H

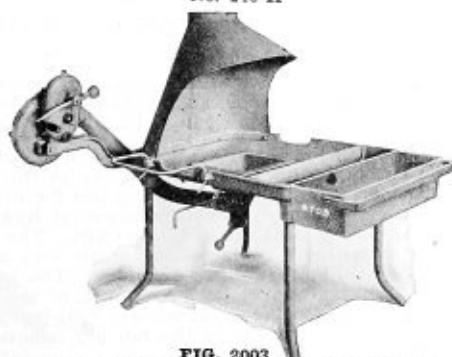


FIG. 2003

No. 650. The old Reliable Forge, has 14-inch Buffalo Silent Blower and heavy duty Vulcan tynere iron door. Best for all around blacksmithing.

No. 670-S. Wagon Makers' Forge. A substantial forge.

No.	Size of Hearth	Size of Blower	Weight	LIST PRICES	
				With Tank	Without Tank
243-H	28x40 in.	14 in.	332 lbs.	\$54.00	\$50.00
246-H	31x44 in.	14 in.	432 lbs.	66.00	62.00
248-H	38x42 in.	14 in.	527 lbs.	76.00	71.00
249-H	38x42 in.	14 in.	632 lbs.	90.00	86.00

BUFFALO DOWN DRAFT FORGE, NO. 243-E

(Formerly No. 660)

Equipped with Buffalo No. 200 Silent Blower
and "Vulcan" Tuyere**FIG. 2004****Save Time Using 14-in. or 16-in. Blower**

Smoke and gases are mechanically removed by the "Down Draft" hood. Part of the unconsumed gases are returned to the fire for full combustion, saving coal and keeping the shop clean and healthful.

Barring the Down Draft hood, and the other improvements mentioned below, the design of this forge is the same as the "Old Reliable" Buffalo Forge No. 0, thousands of which have been in use for over 30 years and are still doing good work. The heavy seamless tube steel legs are cross-braced as shown by cut, giving added strength to the support. The patent eccentric tuyere valve gives easy adjustment to large and small fires and quickly crushes and cleans out clinkers and ashes when revolved. The ash gate is hinged and balanced, so that it opens and closes by a touch of the foot. The blast pressures given in table below for the different size fans are not the maximum, but are obtained with 2200 revolutions of the fan per minute which corresponds to an ordinary, easy crank motion.

No.	Size of Blast		Speed of Fan R. P. M.	Size of Hearth	Shipping Weight Lbs.	LIST PRICES	
	In.	In.				With Water Tank	Without Tank
243E.	14	3	2200	28 x 40	482	79.00	75.00

These Forges regularly shipped without water tank. If tank is wanted add \$4.00 to list price.

We recommend the 14 inch fan. For 12 inch fan deduct \$2.00 from list price. For 16 inch fan add \$5.00 to list price.

BUFFALO STATIONARY FORGE NO. 48

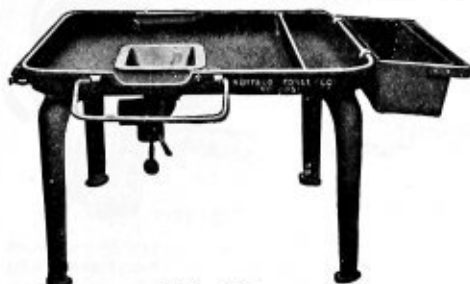


FIG. 2005

This Forge is substantially built of heavy cast iron. The coal box forms an integral part of the fire pan. The water tank, fitted with a tool rack, is detachable for convenience in emptying.

It is fitted with the "Buffalo R. R. Deep Fire, Side and Center Blast, Anti-Clinker Dumping Tuyere," with ash gate which is so hinged and counter-balanced that it opens and closes by a touch of the foot.

No.	Size of Hearth	Depth of Hearth	Blast Connection	Weight	LIST PRICES	
					With Tank	Without Tank
48	38x42 in.	3½ in.	3 in.	350 lbs.	\$40.00	\$35.00

BUFFALO STATIONARY FORGE NO. 49

This Forge has found favor with smiths who perform light, medium and heavy work. It was built originally for heavy work, but does light work equally well. All parts are very strong and carefully fitted, and the forge as a whole is thoroughly efficient.

It is fitted with the Buffalo R. R. Deep Fire, Anti-Clinker Dumping Tuyere, which gives a close regulation of the fire and obtains the full heating efficiency of the fuel.



FIG. 2006

No.	Size of Hearth	Hearth Depth of	Blast Connection	Weight	LIST PRICES	
					With Tank	Without Tank
49	38x42 in.	7 in.	3 in.	400 lbs.	\$50.00	\$45.00

BUFFALO STATIONARY FORGE NO. 97

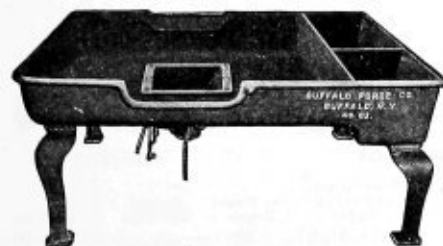


FIG. 2007

Buffalo Stationary Forge No. 97, as shown, is especially adapted to heavy work.

The fire pan has a depth of 8 inches, while the gates on the sides allow the fire to be lowered 4 inches, when it is desirable to have a thin fire. It has an improved tuyere of extra heavy construction. This forge is also supplied with a lever blast gate, coal box and water tank. The coal box and water tank are integral with the body of the forge.

The tuyere pipe is made for 4-inch blast pipe connection.

No.	Size of Hearth	Depth of Hearth	Blast Connection	Weight	List Price
97	46½x47 in.	8 in.	4 in.	745 lbs.	\$80.00

TUYERE IRONS

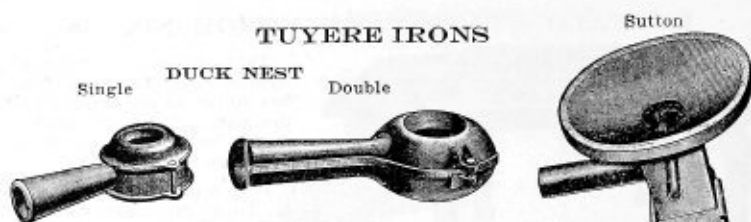


FIG. 2008

FIG. 2009

FIG. 2010

No. 1. Single Duck Nest. Weight, 11 lbs. List Price.....	per dozen, \$8.00
No. 2. Single Duck Nest. Weight, 15 lbs. List Price.....	per dozen, 10.00
No. 3. Single Duck Nest. Weight, 18 lbs. List Price.....	per dozen, 12.00
No. 2. Double Duck Nest. Weight, 17 lbs. List Price.....	per dozen, 12.00
No. 5A. Duck Nest. List Price	per dozen, 6.50
No. 10A. Duck Nest. List Price.....	per dozen, 8.00
Sutton Tuyere. Weight, 40 lbs. List Price.....	each, 5.00



FIG. 2011

NO. 400 "WHIRLWIND" BLAST
ANTI-CLINKER HEAVY NEST
TUYERE IRONS

Depth	in. 5
Width	in. 8 3/4
Length	in. 10 1/2
Dimensions Over All.....	in. 12 3/4 x 14 3/4
Weight	lbs. 60
Price	each 10.00

BUFFALO TUYERE IRONS



FIG. 2012

No. K K



FIG. 2013

No. F F



FIG. 2014

No. E E



FIG. 2015



FIG. 2016



FIG. 2017

Name	Width Over All and Length In.	Blast Pipe Diam. Inches	Inside Depth of Fire Pot Inches	Net Weight Pounds	Style of Ash Gate	List Price
Climax	8 x 7	3	(10 in. high)	20	.....	\$ 3.50
No. RR	12 x 14	3	5	75	.....	7.00
Double Vulcan	12 1/2 x 14	3	4 1/2	75	Counter-Poised	9.00
No. KK	14 x 14	3	.....	70	Slide	7.50
No. FF	13 x 13	3	.....	90	Slide	10.00
No. EE	11-in. diam.	3	4	70	Slide	7.00

No. 2E



FIG. 2018

BUFFALO VARIABLE SPEED ELECTRIC BLOWERS

If your shop is wired for electricity it will cost you nothing to install this Blower. We furnish lamp cord and plug with each outfit. All you have to do is to screw the plug into a lamp socket to make your electric connection.

It is made for direct current and for 25, 40 and 60 cycle A. C., single phase, 110 or 220 volts. Simply state voltage when ordering. Speed, 2200 R. P. M.; height, 15 inches; weight, 50 lbs.

Fifteen feet of regulation wire and plug furnished.

No.	Total Height	Diam. of Outlet	Rev. Per Min.	Weight	List Price
2E	15 in.	3 in.	2200	50 lbs.	\$40.00
2EH	15 in.	3 in.	3000	55 lbs.	56.00
3E	15 in.	4 in.	3000	60 lbs.	72.00

BUFFALO CONSTANT SPEED ELECTRIC BLOWERS

These Blowers are furnished for direct current, 110 or 220 volts; and for alternating current, 60 cycles, single phase, 110 or 220 volts. Please state full characteristics of current when ordering, as a different motor is needed for each condition.

Perfect control of the fire is obtained by the blast gate; the current consumed is at all times in proportion to the amount of blast used. We furnish free, with each outfit, 15 feet of heavy regulation wire, plug and one or more blast gates to correspond with the number of fires to be blown.

Costs nothing to install—simply screw the plug into an ordinary lamp socket. (No. 4-E is an exception, requiring special wiring. No wire or plug is therefore furnished with this size.)

No. 2E



FIG. 2019

No.	Total Height	Diam. of Outlet	Rev. Per Min. A. C. Motor	Rev. Per Min. D. C. Motor	LIST PRICES	
					A. C. Motors	D. C. Motors
2E	15 in.	3 in.	1700	1800	\$40.00	\$40.00
2EH	15 in.	3 in.	3400	3000	56.00	56.00
3E	15 in.	4 in.	3400	3000	72.00	72.00
4E	20 in.	5 in.	3400	3200	100.00	100.00

CHAMPION ELECTRIC BLOWERS

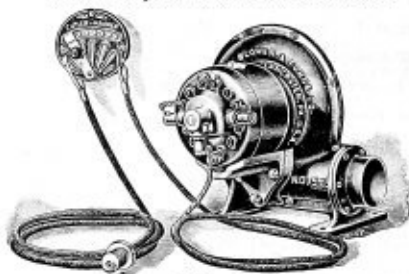
No. 50
Variable Speed With Universal Motor

FIG. 2020

- No. 50 Champion One-Fire Variable Speed Electric Steel Pressure Blacksmith Blower with Universal Motor for both direct and alternating current, either 110 or 220 volts, with detached rheostat for six speeds, with attachment cord and plug to fit any light socket (therefore can be installed without any expense), and Steel Pressure Fan Case, outlet 3 inches in diameter, for all kinds of general blacksmith work. Weight, 55 pounds.\$40.00
- No. 51 Electric Blower, same as No. 50, except one-half size larger. For extra heavy fire. Outlet, 3 inches in diameter; weight, 85 lbs. 60.00

No. 2
Direct-Connected Constant Speed

FIG. 2021

- CONSTANT SPEED DIRECT CONNECTED ELECTRIC BLOWERS**
- No. 20 Direct Connected Constant Speed Electric Blower, 15 inches in height, diameter of outlet, 3¼ inches. Suitable for one or two fires, either direct or alternating current, 110 or 220 volts. Weight, 100 lbs. ..\$ 48.00
- No. 2 Champion Direct Connected Constant Speed Electric Blower, 15 inches in height; inside diameter of outlet, 3½ inches; suitable for one to four fires, either alternating current or direct current, 110 or 220 volts. Weight, 115 lbs. 55.00
- No. 3 Direct Connected Constant Speed Electric Blower, 20 inches in height, diameter of outlet 4¼ inches; suitable for one to six fires, either direct or alternating current, 110 or 220 volts. Weight, 150 lbs. 110.00
- No. 4 Direct Connected Constant Speed Electric Blower, 25½ inches in height, inside diameter of outlet 7½ inches, for one to nine fires, either alternating current or direct current, 110 or 220 volts. Weight, 265 lbs. 115.00

INSTRUCTIONS FOR ORDERING ELECTRIC BLOWERS

- 1st—Get your information from the plant that generates the electric current you will use.
- 2d—Find if the current is direct or alternating.
- 3d—If direct it is necessary that you find the voltage only.
- 4th—If alternating, you must find cycles or alternations, phase and voltage.
- 5th—60 cycles or 7200 alternations furnished regularly.
- 6th—Both currents can be furnished regularly for either 110 or 220 volts.
- 7th—Other cycles and voltages are special and require correspondence.

Blower

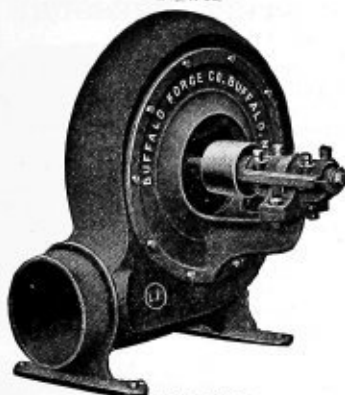


FIG. 2022

BUFFALO "B" VOLUME BLOWERS AND "B" VOLUME EXHAUSTERS

Exhauster

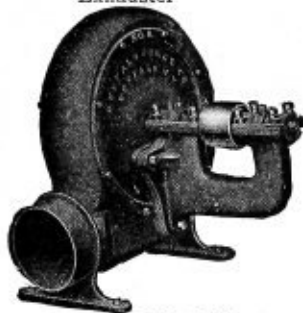


FIG. 2023

Please specify number and name in full: "B" Volume Blower or Exhauster, and the "hand." The "hand" is determined by the location of pulley on right or left side of blower or exhauster when one stands facing the outlet. Right hand is always shipped unless otherwise specified, but no extra charge is made for left hand. 10% extra is charged if direction of discharge is wanted different from above.

No.	Total Height Inches	Diam. of Outlets Blowers and Exhausters Inches	Diam. of Inlets Exhausters Only Inches	PULLEYS		Weight Lbs.	List Price
				Diam. Inches	Face Inches		
000	14 $\frac{3}{4}$	5 $\frac{1}{8}$	5	2 $\frac{3}{4}$	2 $\frac{1}{4}$	45	\$ 23.00
1	15 $\frac{1}{2}$	4 $\frac{7}{8}$	5 $\frac{1}{4}$	3	2 $\frac{1}{2}$	60	30.00
2	20 $\frac{1}{2}$	6	6	3 $\frac{1}{4}$	2 $\frac{3}{4}$	100	38.00
3	25	7 $\frac{1}{8}$	7 $\frac{1}{2}$	4	3	170	54.00
4	28	9	9	5	3 $\frac{3}{4}$	200	66.00
5	31 $\frac{1}{8}$	10 $\frac{5}{8}$	10 $\frac{1}{2}$	5 $\frac{3}{4}$	4 $\frac{1}{2}$	275	83.00
6	37 $\frac{1}{8}$	11	12 $\frac{1}{8}$	6 $\frac{1}{2}$	5 $\frac{1}{4}$	380	105.00
7	42 $\frac{3}{8}$	14	14	7 $\frac{1}{2}$	6 $\frac{1}{4}$	575	135.00
8	47 $\frac{1}{8}$	16 $\frac{1}{2}$	16	8 $\frac{1}{2}$	7 $\frac{1}{4}$	725	225.00
9	55 $\frac{1}{8}$	17 $\frac{1}{2}$	17 $\frac{1}{4}$	9 $\frac{1}{2}$	8 $\frac{1}{4}$	1100	300.00
10	63 $\frac{3}{8}$	21	21	12	9 $\frac{3}{4}$	1600	375.00
11	68 $\frac{3}{8}$	24 $\frac{1}{2}$	24 $\frac{1}{2}$	14	12	3200	525.00

BUFFALO EXPERIMENTAL BLOWERS AND EXHAUSTERS

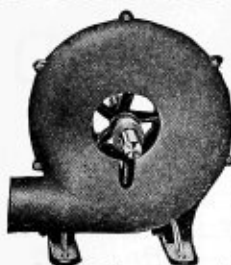


FIG. 2024

These Blowers are intended especially for blowing fires in portable and small stationary boilers, for experimenting and various purposes where a small quantity of air, at an average pressure, is desired. The No. 6 is sufficient to blow one forge fire; No. $\frac{1}{2}$ is sufficient for three forge fires of average size.

When ordering, state whether blower or exhauster is wanted. A blower cannot be used as an exhauster.



FIG. 2025

No.	Total Height	Diam. of Outlets	PULLEYS		Weight	List Price
			Diam.	Face		
00	11 in.	2 $\frac{3}{4}$ in.	1 $\frac{1}{4}$ in.	1 $\frac{1}{4}$ in.	20 lbs.	\$ 8.00
0	15 in.	3 in.	1 $\frac{3}{4}$ in.	1 $\frac{3}{4}$ in.	30 lbs.	10.00
$\frac{1}{2}$	20 in.	4 $\frac{1}{2}$ in.	1 $\frac{3}{4}$ in.	2 in.	45 lbs.	14.00

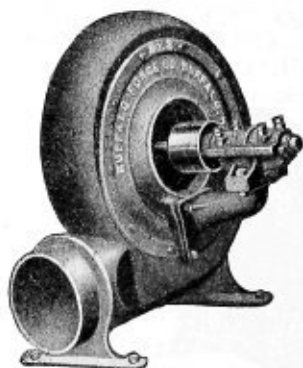


FIG. 2026

BUFFALO STEEL PRESSURE BLOWERS

Nos. 1 to 6 have but one pulley, while all larger sizes have two pulleys. In ordering, please give Blower No. and name "Steel Pressure Blower" in full. Also indicate hand discharge. By "hand" is meant the side (left or right) on which pulley is located when one stands facing the outlet or outlet end of the blower. This, of course, only refers to sizes Nos. 1 to 6, which have one pulley. If no "hand" is specified, we always ship right hand. No extra charge is made for left hand. Discharges may be bottom horizontal, top horizontal, up blast, and down blast. Bottom horizontal discharge is always furnished unless otherwise specified. All other discharges cost 10% extra.

No.	Total Height Inches	Diam. of Outlet Inches	PULLEYS		Weight Lbs.	List Price
			Diam. Inches	Face Inches		
1	12½	3½	2¼	1¾	55	\$ 18.00
2	15¾	4	2¾	2¼	75	27.00
3	19¼	4¾	3	2¾	95	39.00
4	23½	5	4	3	135	54.00
5	25¾	5¾	4¼	3	180	66.00
6	29¾	6¼	4½	3½	265	83.00
7	33¼	7¼	5	4½	308	105.00
8	38	8¾	6	4½	445	135.00
9	44	10	7	5	635	175.00
10	56	12¼	8	5¾	820	240.00
11	65½	14½	8½	6½	1400	340.00
11½	74	16½	10	7	1870	415.00
12	75½	18	10	8	1950	490.00

BUFFALO SLIDE PATTERN BLAST GATES

The frames of these gates are of heavy cast iron. The slides are of heavy gauge steel plate. Customers are offered the choice of two forms, i. e., the slide and lever types, the slide type being sent in the absence of specific instructions.

The Buffalo Improved Blast Gates are especially designed for opening, closing and regulating the blast in air-conveying pipes for various duties.



FIG. 2027

Size Inches	Weight Lbs.	List Price	Size Inches	Weight Lbs.	List Price	Size Inches	Weight Lbs.	List Price
2	1½	\$1.00	7	15	\$3.00	14	45	\$ 8.00
2½	2	1.25	8	20	3.50	16	70	12.00
3	2½	1.50	9	25	4.25	18	80	16.00
4	5	2.00	10	30	5.00	20	95	18.00
5	7	2.25	11	35	5.75	22	110	19.50
6	10	2.50	12	38	6.50	24	125	21.00

BUFFALO STANDARD REVERSIBLE MILL EXHAUSTERS



FIG. 2028

The fan wheel, also called the blast wheel, is mounted upon a heavy cast iron spider or hub. The spokes to which the vanes or blades of the fan are securely riveted are of tee steel, cast into the hub, insuring strength and rigidity. The vanes of heavy plate steel are not only riveted to the spokes, but also to the heavy steel plate side flanges.

Size	Outside Diameter of Inlets and Outlets	PULLEYS		Weight	Price of Single Fan
		Diameter	Face		
30	12 in.	6 in.	4½ in.	300 lbs.	\$125.00
35	14 in.	7 in.	5½ in.	365 lbs.	150.00
40	16 in.	8 in.	6½ in.	500 lbs.	200.00
45	18 in.	9 in.	7½ in.	675 lbs.	250.00
50	20 in.	10 in.	8½ in.	900 lbs.	290.00
55	22 in.	11 in.	9½ in.	1125 lbs.	360.00
60	24 in.	12 in.	10½ in.	1400 lbs.	450.00
70	28 in.	14 in.	11½ in.	1800 lbs.	600.00
80	32 in.	16 in.	12½ in.	2300 lbs.	700.00

BUFFALO STANDARD REVERSIBLE MILL EXHAUSTERS

It is often advisable to use a double fan, since less head room is required and the piping system is simplified. By placing a double exhauster in a central position, and running independent pipes to each end of the room, bends are avoided and material to be moved has less distance to travel, reducing the amount of power required. The expense of installing a double exhauster is less than that of putting in two single fans.

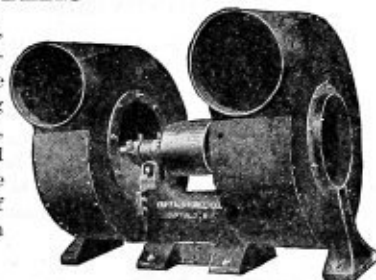


FIG. 2029

Size	Outside Diameter of Inlets and Outlets	PULLEYS		Weight	Price of Double Fan
		Diameter	Face		
30	12 in.	6 in.	6½ in.	500 lbs.	\$220.00
35	14 in.	7 in.	7½ in.	600 lbs.	270.00
40	16 in.	8 in.	8½ in.	750 lbs.	330.00
45	18 in.	10 in.	9½ in.	1000 lbs.	440.00
50	20 in.	12 in.	10½ in.	1350 lbs.	515.00
55	22 in.	13 in.	11½ in.	1725 lbs.	640.00
60	24 in.	14 in.	12½ in.	2100 lbs.	810.00
70	28 in.	16 in.	14 in.	2700 lbs.	1,060.00
80	32 in.	20 in.	16 in.	3000 lbs.	1,300.00

"ABC" Type E Exhaust Fan,
Single, Right Hand, Bot-
tom Horizontal Discharge.
Nos. 25 to 80

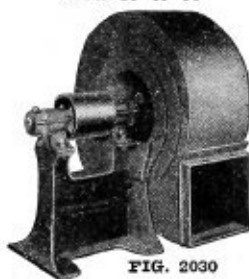


FIG. 2030

"ABC" TYPE E STEEL PLATE EXHAUST FANS

Fans of this type are adapted for pneumatic conveying systems of all descriptions, for the removal of shavings and dust; elevating and distributing cotton and wool; removal of smoke and fumes from forge fires; steam and vapor from vats and kettles in breweries, packing houses, textile and rubber factories.

In inquiring for prices or ordering, state purpose for which fan is to be used, giving as many details as possible as to available power, approximate location, etc. If for handling refuse, state number, size and make of machines to be taken care of.

No. of Fan	List Price		Diameter of Inlet, Inches	Outside Dimension of Outlet, Inches	Revolutions per Minute 1 to 4 oz. Pressure	Capacity Cu. Ft. Per Minute Single Fans	Brake H. P. Single Fans. Double this for Double Fans	Weight Lbs.	
	Single	Double						Sgl.	Dbl.
25	\$126.00	\$222.00	11	9 5/8 x 9 5/8	1390-3100	1555- 3100	1.06- 8.5	250	500
30	163.00	280.00	13	11 3/8 x 11 3/8	1170-2345	2240- 4475	1.52-12.2	375	700
35	194.00	328.00	15	12 3/4 x 12 3/4	1010-2025	3040- 6085	2.07-16.6	500	800
40	247.00	414.00	17	14 1/4 x 14 1/4	890-1785	3380- 7955	2.72-21.7	700	1100
45	309.00	512.00	19	16 3/8 x 16 3/8	795-1590	6030-10050	3.42-27.4	875	1300
50	384.00	636.00	21	18 x 18	719-1440	6220-12420	4.24-33.9	1050	1700
55	450.00	744.00	23	19 1/2 x 19 1/2	655-1310	7530-15050	5.13-41.0	1250	2200
60	595.00	922.00	25	21 1/2 x 21 1/2	587-1175	8960-17900	6.11-48.9	1650	2800
70	805.00	1336.00	29	24 1/2 x 24 1/2	530-1060	10500-21000	7.15-57.4	2300	4200
80	1005.00	1666.00	33	27 3/4 x 27 3/4	464- 930	13980-28000	9.53-76.2	3400	5600

"ABC" TYPE P STEEL PRESSURE BLOWERS

FOR CUPOLAS, FORGE FIRES AND
FURNACES

These Blowers are designed and constructed for delivering air at high pressures; hence they are especially adapted for supplying blast to forge fires, heating furnaces, cupolas, sand blast machines, cooling molds in glass works, or for forcing air long distances as in pneumatic tube systems.

"ABC" Universal Type P
Blower, Bottom Horizontal
Discharge, Nos. 1 to 10,
inclusive



FIG. 2031

No. Blower	List Price	Outlet Outside Diam. Inches	Pressure Ounces	Revolutions Per Minute	Capacity Cubic Feet Per Minute	Brake Horse-power	Weight Pounds
1	\$145.00	6	2- 5	1960-3095	361- 560	0.45- 1.74	200
2	178.00	7	2- 6	1675-2895	498- 843	0.62- 3.15	280
3	200.00	8	2- 9	1460-3085	655-1365	0.82- 7.62	375
4	245.00	9	2-11	1292-3030	838-1930	1.04-13.16	475
5	290.00	10	2-14	1162-3075	1040-2700	1.30-23.45	650
6	331.00	11	2-16	1055-2980	1262-3590	1.57-34.70	765
7	436.00	12 1/2	2-16	889-2510	1705-4750	2.12-47.00	1040
8	On	14 1/2	2-16	769-2170	2140-5040	2.60-59.00	1375
9	Appli-	16 1/2	2-16	679-1916	2800-7760	3.48-77.00	1750
10	cation	18 1/2	2-16	606-1710	3350-9300	4.17-82.25	2200

BUFFALO PULLEY DISC FANS

Bearings on the same side of fan on sizes from 18-inch to 48-inch



FIG. 2032

All sizes up to and including 48-inch diameter are made with oil ring bearings arranged on the same side of the fan. This avoids the troublesome and dangerous practice of reaching through the fan blades to oil up.

The Buffalo Oil Ring Bearings are extra long, babbitted, and with oil grooves which distribute the oil evenly over the entire wearing surface.

Sizes from 54-inch up are made with plain bearings and over-hung pulley

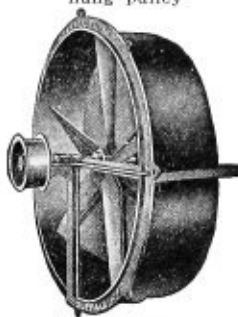


FIG. 2033

Size	Normal Speed	Cu. Ft. Air per minute	Horse Power Required	Size of Pulley	Weight Pounds	List Prices
18	1000	2200	0.25	2 x 4	75	\$ 40.00
24	800	4000	0.50	2 x 4	100	50.00
30	650	6200	0.75	2 3/4 x 6	170	65.00
36	525	8800	1.00	3 x 7	230	85.00
42	450	12000	1.50	3 1/2 x 8	325	110.00
48	400	18000	2.00	4 x 9	445	125.00
54	350	21000	2.50	4 x 9	560	175.00
60	320	25000	3.00	5 x 10	630	250.00
72	265	36000	5.00	5 1/2 x 12	820	300.00
84	227	50000	7.50	6 x 14	990	350.00

BUFFALO ELECTRIC DISC FANS

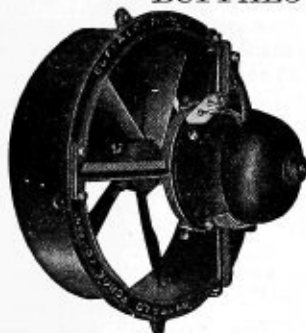


FIG. 2034

In hotels, restaurants, department stores, theatres, and other public places, the Disk Fan can easily be installed so as to be completely concealed, without affecting its efficiency.

Tell us the size of the room you want to ventilate and the conditions, and we will recommend a suitable outfit.

NOTE: For capacities and H. P. see table above.



FIG. 2035

Size	Weight	R.P.M.	D. C. Motor	A. C. Motor	Size	Weight	R.P.M.	General Electric Motor	Peerless Motor
18 in.	125 lbs.	1000	\$ 90.00	\$110.00	36 in.	450 lbs.	525	\$327.50	\$310.00
24 in.	200 lbs.	900	112.50	160.00	42 in.	625 lbs.	450	425.00	410.00
30 in.	300 lbs.	800	140.00	230.00	48 in.	800 lbs.	400	512.00	500.00

AMERICAN BLOWER CO. "VENTURA" DISC VENTILATING FANS

Wall Type, Pulley Driven



FIG. 2036

Is positively the latest development in disc fan design and construction. *Light, Strong, Quiet, Efficient.*

Ten broad blades with proper dip or curve produce large volumes freely or against pressures up to one inch, and so efficiently that the power consumption is about two-thirds the usual. *Large Central Disc* absolutely prevents back flow of air through the center when working against pressure.

All sizes are provided with ring oiling bearings.

Wall Type with Motor



FIG. 2037

PULLEY FANS FOR GENERAL VENTILATING SERVICE

No. of Fan	List Price Pulley Driven	Diam. of Wheel	Diam. Over All	PULLEY		Diam. of Shaft	Weight Lbs.	Revolutions per Minute	Capacity Cu. Ft. per Minute Unobstructed Inlet and Discharge
				Diam.	Face				
3	\$50.00	16	23	3 1/2	2 1/4	1 1/2	75	625-2190	950-3320
4	60.00	21 3/4	28 1/4	5	3 3/4	1 3/4	100	470-1645	1620-5670
5	75.00	26 3/4	34 1/2	6	4 3/4	1 1/2	170	375-1310	2500-8750
6	92.00	32	40 1/4	8	5 3/4	1 3/4	240	315-1100	3560-12500
7	112.00	37 1/2	45 3/4	10	6 3/4	1 3/4	350	268-936	4800-16800
8	140.00	42 3/4	51 1/4	12	7 3/4	1 3/4	500	234-817	6350-21850
9	180.00	48	56 3/4	15	8 3/4	1 3/4	700	209-730	7875-27500

Prices on Electric Fans on Application.



FIG. 2038

"VENTURA" DISC MINE FANS

The Ventura Disc Mine Fan is especially adapted to the ventilation of drift mines and for development work on new operations. It has superior constructional features throughout and an exceptionally high mechanical efficiency, whereby it will perform a given duty with approximately two-thirds the horsepower requirements of any other disc fan on the market.

Diam. of Wheel	List Price	PULLEY		Diam. Over All	Diam. of Shaft	Width of Case	Weight Lbs.	Revolutions per Minute	Capacity In Cu. Ft. per Minute Against Static Press 1/2" to 1 1/4"
		Diam.	Face						
48	\$400	13	5 1/2	58	1 1/2	15 1/4	1220	424-946	12550-28000
54	540	14	6 1/4	65	1 3/4	17 1/2	1400	376-840	15800-35300
60	720	16	6 1/4	72	2 1/4	19 1/2	1950	338-755	19400-43450
66	900	16	7 1/4	79	2 1/2	21 1/2	2280	308-688	23400-52200
72	1025	18	8	85	2 1/2	24	2600	282-630	27800-62250
84	1400	20	9	101	2 3/4	27	3400	241-541	37750-84300
96	1750	24	10	107	3 1/4	31 1/2	4220	211-473	49000-109820
108	2180	28	12	130	3 1/2	35	5500	188-420	62000-138800

Dimensions are in inches

WHITNEY JR. No. 5 HAND PUNCH



FIG. 2039

For tinners and sheet metal workers. Will punch $\frac{1}{4}$ -inch hole through No. 18 gauge iron. Weight, $2\frac{3}{4}$ pounds. Punches to center of 3 inches. Length, $8\frac{1}{4}$ inches. Price, including 3 sets of punches and dies, $\frac{1}{8}$, $\frac{3}{16}$ and $\frac{1}{4}$ -inch.... \$6.00
Extra punches and dies....per set .60
Other sizes to order..... .75

BALL-BEARING HAND PUNCH



FIG. 2040

Capacity of tool, $\frac{3}{8}$ -inch hole through $\frac{1}{4}$ -inch metal or its equivalent. Depth of throat, $1\frac{1}{2}$ inches. Length of levers, 18 inches. Weight of punch complete with levers, $8\frac{1}{2}$ pounds.
Priceeach \$15.00

No. 40B ALL BALL-BEARING PORTABLE STEEL I-BEAM AND CHANNEL PUNCH

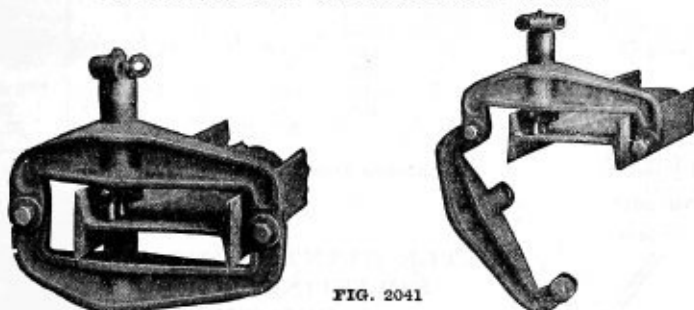


FIG. 2041

This marvelously effective punch should be of peculiar interest to all structural iron workers where I-beam, channel and angle iron punchings are required. It is easily portable to any part of structural work in place, is quickly adjusted to the prick point, and requires only a small fraction of a minute to accomplish the hole of required diameter, and at any point between center and either edge, for all steel structural and bridge work this punch is a marvel.

Will punch diameter	inch	1
Will punch thick	inch	$\frac{3}{2}$
Depth of throat	inches	12
Weight	pounds	120
Price		\$130.00

Price includes one die and one punch of desired size. Extra punches up to $\frac{11}{16}$ -inch diameter, each \$1.00. Extra dies up to $\frac{11}{16}$ -inch diameter, each \$1.00.

LITTLE GIANT PORTABLE HAND PUNCHES

No. 1, without Stand



FIG. 2042

No. 2, with Stand



FIG. 2043

Capacity $\frac{1}{4}$ -inch hole in $\frac{1}{4}$ -inch iron, or its equivalent.

Depth of throat, 2 inches; opening, $\frac{1}{2}$ -inch.

Will punch $\frac{1}{2}$ -inch from inside edge of angle iron; length over all, 39 inches; weight, 16 pounds.

No. 1, With $\frac{1}{4}$ -inch punch and die.....\$12.50

No. 2, With $\frac{1}{4}$ -inch punch and die, including cap and bolts..... 14.00

Extra punches $\frac{1}{8}$ to $\frac{1}{2}$ -inch, \$1.00 net extra. Extra dies $\frac{1}{8}$ to $\frac{1}{2}$ -inch, 75c net extra.

LITTLE GIANT COMBINED PUNCH AND SHEAR



FIG. 2044

Style B

Size	No. 1	No. 2	No. 3
Cuts flat iron.....in.	$\frac{5}{8}$ x $2\frac{1}{2}$	$\frac{1}{2}$ x 4	$\frac{3}{8}$ x 4
Cuts band iron.....in.	$\frac{1}{4}$ x 8	$\frac{1}{4}$ x 7	$\frac{1}{4}$ x 6
Cuts round iron.....in.	1	$\frac{3}{4}$	$\frac{3}{4}$
Will punch.....in.	$\frac{5}{8}$ hole in $\frac{1}{2}$	$\frac{1}{2}$ hole in $\frac{1}{2}$	$\frac{3}{8}$ hole in $\frac{3}{8}$
Will punch from edge.....in.	$3\frac{1}{2}$	$2\frac{1}{4}$	$2\frac{1}{2}$
Size of punches and dies with each machine.....in.	$\frac{5}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, $1\frac{1}{8}$, $1\frac{1}{4}$	$\frac{5}{8}$, $\frac{1}{2}$, $1\frac{1}{8}$, $1\frac{1}{4}$	$\frac{1}{2}$, $\frac{3}{4}$, $1\frac{1}{8}$, $1\frac{1}{4}$
Floor space occupied.....in.	12 x 26	10 x 24	8 x 22
Weight.....lbs.	525	350	280
Price, complete.....	\$62.50	50.00	37.50

Extra punches and dies (regular sizes) 50c each net.

LITTLE GIANT COMBINED PUNCH,
SPLITTING SHEAR AND
ROD CUTTER

FIG. 2045

Will split sheets up to $\frac{1}{8}$ -inch; will cut bar iron $\frac{1}{4}$ x $2\frac{1}{2}$ inches; will punch $\frac{5}{16}$ in $\frac{1}{4}$ -inch iron; will cut round iron up to $\frac{1}{2}$ -inch; will punch 3 inches from edge of sheets; Length of shear blades, 10 inches; height over all, except levers, 46 inches; floor space occupied, 23x20 inches; weight 350 pounds.

Price with one each $\frac{3}{16}$, $\frac{1}{4}$ and $\frac{5}{16}$ -inch punches and dies\$62.50



FIG. 2046

LITTLE GIANT SPLITTING SHEAR**STYLE E2**

Will split sheets up to $\frac{3}{16}$ -inch; will cut $\frac{3}{8}$ x2-inch bar iron; length of shear blades, 7 inches; height, 44 inches; adjustable lever 54 inches long; space occupied, 23x23 inches; weight, 400 pounds.

Price\$50.00



FIG. 2047

LITTLE GIANT SPLITTING SHEAR**STYLE E1**

Will split sheets up to $\frac{1}{8}$ -inch; will cut $\frac{3}{16}$ x3-inch bar iron; length of shear blades, $4\frac{1}{2}$ inches; height, $16\frac{1}{2}$ inches; space occupied, 7x16 inches; weight, 90 pounds.

Price as shown.....\$20.00

Price on legs..... 25.00



FIG. 2048

LITTLE GIANT SCROLL AND TUBE PUNCH**STYLE G**

Will punch $\frac{1}{4}$ -inch hole in $\frac{3}{16}$ -inch iron; will punch $\frac{3}{8}$ -inch from edge; will punch scrolls or tubes $1\frac{1}{2}$ inches in diameter and larger; size of punches with each machine, $\frac{3}{16}$ and $\frac{1}{4}$; height, $13\frac{1}{2}$ inches; space occupied, $6\frac{1}{2}$ x14 inches; weight, 75 pounds.

Price\$27.50



FIG. 2049

LITTLE GIANT DEEP THROAT PUNCH**STYLE H**

Will punch $\frac{1}{4}$ -inch hole in $\frac{1}{8}$ -inch iron and 15 inches from edge; will punch $\frac{1}{4}$ -inch hole in $\frac{1}{4}$ -inch iron $2\frac{1}{2}$ inches from edge, with stay bolts in; height (less lever), 20 inches; adjustable lever 36 inches long; space occupied, 7x29 inches.

Price with $\frac{3}{16}$, $\frac{1}{4}$ and $\frac{5}{16}$ -inch punches and dies, lever and staybolts.....\$30.00

Price complete on legs or stand..... 40.00

Extra punches and dies 50c each net.

BUFFALO "ARMOR" PLATE BAR CUTTERS AND ANGLE CUTTERS

No. 10



FIG. 2050

These machines will cut twisted and straight bars of any size up to their full capacity. The stripper in front prevents binding of the bars, and the roller keeps the bars from sliding directly over the knives so that they will not become dull. The leverage is arranged with a segment; by stepping on treadle, the segment is allowed to fall back into place after cutting, making machine ready for new cut without delay. The handiest, strongest, lightest machines made for the purpose.

No. 2



FIG. 2051

No.	Cuts Rounds	Cuts Twisted	Cuts Angles	Weight	List Price
10	1 1/4 in.	1 in.	.....	315 lbs.	\$95.00
1	.....	...	1 1/2 x 1 1/2 x 3/8	150 lbs.	30.00
2	.....	...	2 1/2 x 2 1/2 x 1/2	200 lbs.	40.00

BUFFALO "ARMOR" PLATE SHEAR AND "ARMOR" PLATE PUNCHER

No. 4

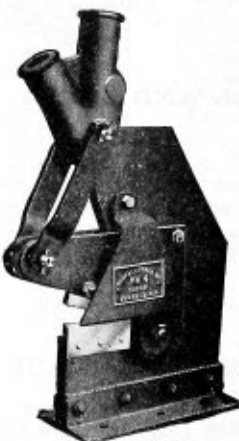


FIG. 2052

The frame of these punches consists of heavy steel plate with a tensile strength 6 to 8 times greater than that of cast iron. Gives maximum cutting capacity, absolute insurance against breakage.

The levers are so designed that the pressure increases from the beginning of the stroke, reaching the maximum at the time the metal offers the greatest resistance.

NOTE—If No. 3 or No. 4 shear is wanted on legs, add \$5.00 to list.

No. 14B



FIG. 2053

No.	Cuts Rounds Up to	Cuts Flats Up to	Punches Up to	Depth of Throat	Punches Furnished	Weight	List Price
3	3/4 in.	3 x 1 1/2 in.	.....	.....	.....	100 lbs.	\$50.00
4	1 in.	3 x 3/8 in.	.....	.....	.....	250 lbs.	70.00
13B	.....	.....	1/4 x 1/4	4 in.	1/8 x 1/4	100 lbs.	40.00
14B	.....	.....	3/8 x 3/8	4 1/2 in.	1/8 x 3/8	125 lbs.	50.00
15B	.....	.....	1/2 x 1/2	5 1/4 in.	1/4, 3/8 x 1/2	200 lbs.	70.00

No. 1

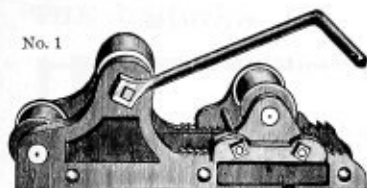


FIG. 2054
Nos. 2 and 2½

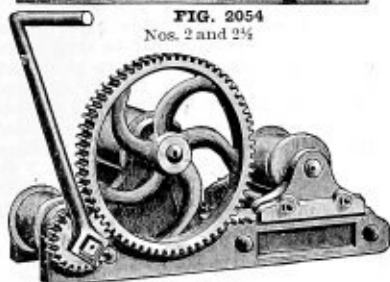


FIG. 2055

No. 3

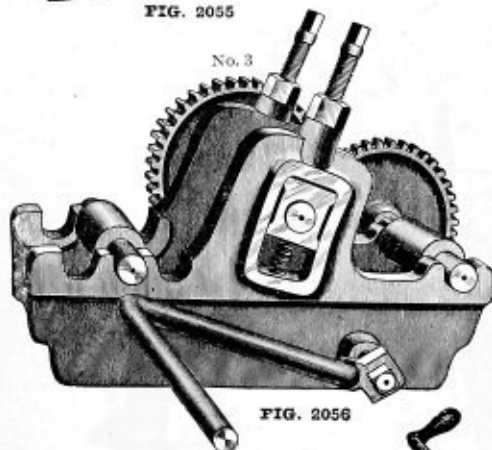


FIG. 2056

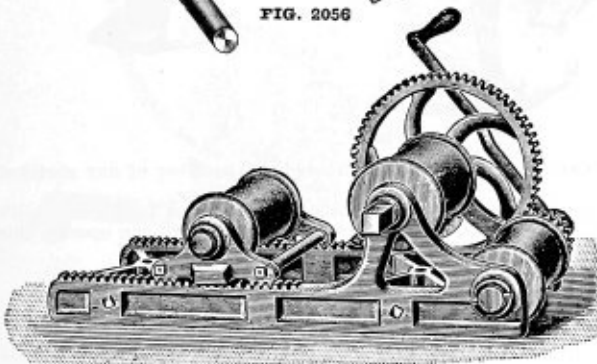


FIG. 2057

TIRE BENDERS

No. 1. This machine is made with turned rollers and bearings, and will bend 3¼-inch tire, or smaller, to a circle 24 inches in diameter, or larger.

List price, with crank.....\$6.00

No. 2 is made with gear and pinion, has turned rollers and bearings, and will bend 3¼-inch tire, or smaller, to a circle 24 inches in diameter, or larger.

List price, with crank7.00

No. 2½ is made as No. 2, but will bend 4½-inch tire, or smaller to a circle 24 inches in diameter, or larger.

List price, with crank.....7.75

No. 2½ is made as No. 2, but will bend 6-inch tire, or smaller, to a circle 24 inches in diameter, or larger.

List price, with crank.....8.50

NO. 3 EXTRA HEAVY

This machine is double-gear, has turned rollers and bearings, is very strong and durable, and will bend 5-inch tire, or smaller, to a circle 24 inches in diameter, or larger.

In bending very heavy tire, two cranks may be used on opposite sides, thus giving double power.

List price, with one crank.....\$10.50

List price, with pulley for power.....16.00

NO. 2 TIRE BENDER

This machine weighs 125 pounds. Will accomplish a large range of work. The rolls are six inches wide.

The proportions of the tool are the best possible for the weight, insuring long wear and full value for the price.

List price..\$12.00

THE REYNOLDS AXLE GAUGE



FIG. 2058

No up-to-date mechanic can afford to be without the Reynolds Axle Gauge. This is the simplest and best axle gauge on the market and must be seen to be appreciated. Adjusts itself to the spindle and automatically registers in plain inch measure on the indicator plate, the exact amount of set or gather. Easily adjusted to any length axle. Accurate, durable and easily operated. Can be used without removing axle from vehicle. Don't bother any longer with the old-fashioned straight-edge but order today one of these indispensable tools. It will last a lifetime.

Money back if you are not pleased.

Priceeach \$2.75

WESTERN CHIEF TIRE AND AXLE SHRINKER

No. 1½

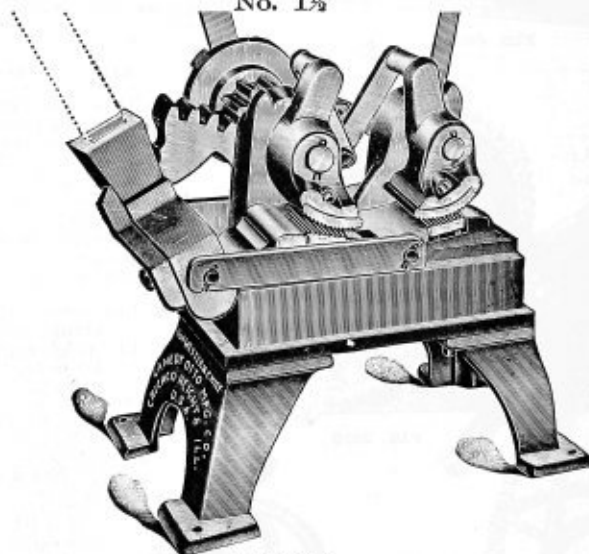


FIG. 2059

This shrinker is guaranteed to operate with one-half the labor of any shrinker of equal capacity.

The shrinking lever pulls toward the machine, not away, as is the case with other makes, and with a powerfully arranged gearing a light man can operate this shrinker to its full capacity.

The bed has an open-and-shut movement of 15/8 inches.

The jaws are machine-cut, tool steel, properly hardened.

Size of jaws, 4½ inches wide, and will shrink from smallest to 4x1 inch round-edge tires, and 1¼-inch square axles.

Weight, 400 pounds. Price.....\$98.25

THE IMPROVED STODDARD TIRE SHRINKER

Fastened to side of wall.

The dogs, which grip the tire, are faced with tool steel plates. These hold the tire perfectly without slipping, wear a long time and can be resharpened by the user and finally replaced at a small expense. They are held to the eccentric dogs by means of screws.

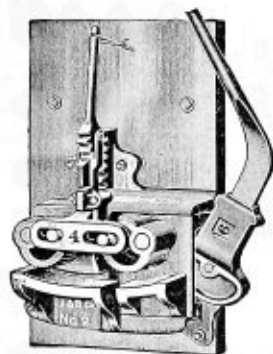


FIG. 2060

We are prepared to furnish the following sizes:

	List Price
No. 1—For upsetting 2-inch tire.....	\$ 8.00
No. 2—For upsetting 4-inch tire.....	14.00
No. 3—For upsetting 4-inch tire and axles up to 1 3/4 inches thick	17.50
No. 4—For upsetting 6-inch tire.....	22.50
No. 5—For upsetting 6-inch tire and axles up to 2 inches thick	27.00

"MOLE" TIRE SHRINKER

An iron lever is furnished with each shrinker.

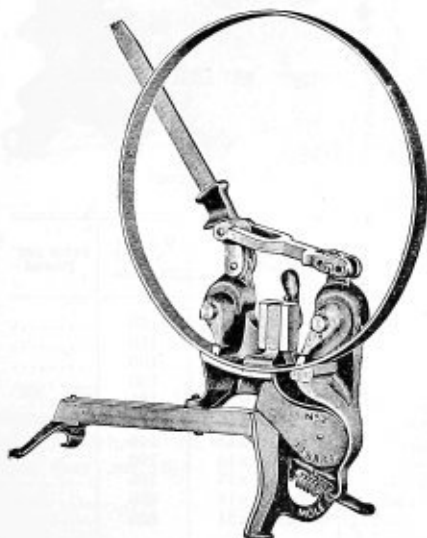


FIG. 2061

	List Price
No. 1—Without antikinker, with 2 1/2-inch bed.....	\$ 8.00

No. 2 — Without antikinker, with 3-inch bed	12.00
--	-------

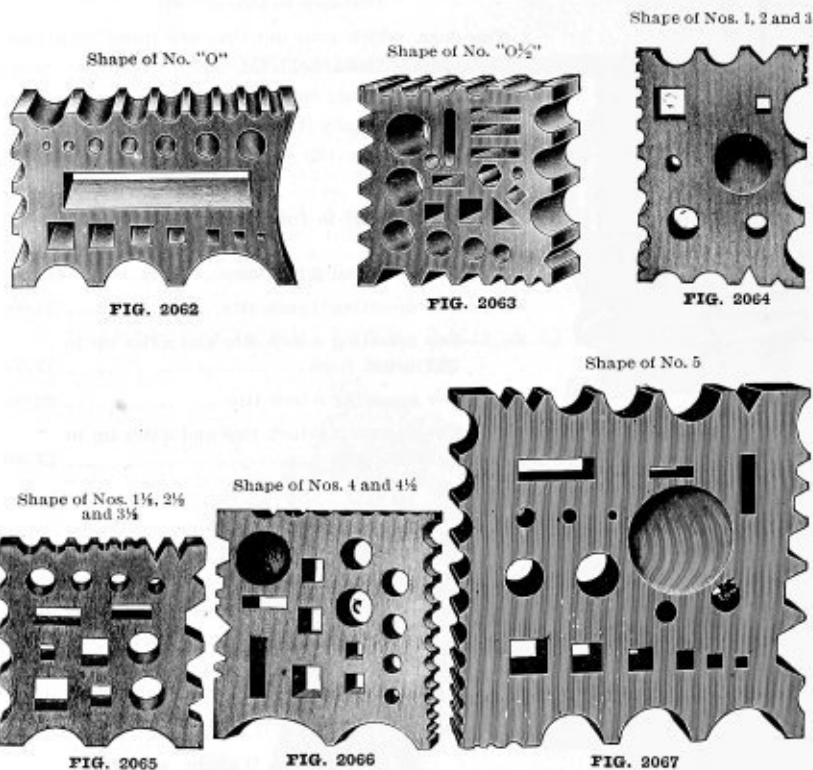
No. 3 — Without antikinker, with 4-inch bed	14.50
--	-------

No. 2—With antikinker, with 3-inch bed	12.50
---	-------

No. 3—With antikinker, with 4-inch bed	15.00
---	-------

Cut shows machine with anti-kinking device.

CAST-IRON SWAGE BLOCKS



Number	Measures, Inches	Weight, About Pounds	Price per Pound
"O"	4 x14 $\frac{1}{2}$ x19 $\frac{1}{2}$	165	.....
"O $\frac{1}{2}$ "	3 $\frac{3}{4}$ x15 x15	150	.....
1.	3 $\frac{3}{4}$ x10 x14	100	.....
1 $\frac{1}{2}$.	4 x12 $\frac{1}{2}$ x12 $\frac{1}{2}$	100	.....
2.	3 $\frac{3}{4}$ x11 x15	125	.....
2 $\frac{1}{2}$.	4 x15 x15	160	.....
3.	4 $\frac{1}{2}$ x11 x15	145	.....
3 $\frac{1}{2}$.	4 $\frac{1}{2}$ x16 x16	190	.....
4.	4 x15 x15	165	.....
4 $\frac{1}{2}$.	4 $\frac{1}{2}$ x18 x18	255	.....
5.	6 x24 x24	625	.....

Stands can be furnished for these Blocks.

CHENEY'S B. S. CONES OR MANDRELS

CAST IRON

These mandrels are made with a slot as shown in cut, which is very convenient for holding end of iron in bending rings; they are strengthened with ties inside the slot. The slot is also convenient for handling rings with tongs.

Size	Height in	Diameter at Base in.	Diameter at Top in.	Approx. Weight Lbs.
No. 1	32	8	1	60
No. 1½	40	10	1	100
No. 2	48	12	1	125
No. 3	52	14	1	150
No. 4	54	16	2	220
Price	per lb., \$....			



FIG. 2068

TIRE-MEASURING WHEELS

GRADUATED

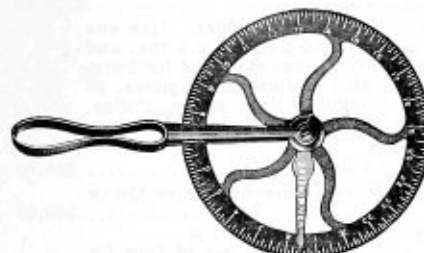


FIG. 2069

No. 606—The Graduated Tire Wheel, a drop-forging, is made so that the figures and lines are raised above the surface of the wheel and cannot be filled or defaced with rust or dirt. The wheel is graduated to eighths of an inch and the circumference is exactly two feet.

Price\$1.50

PLAIN

No. 607—A perfect-running wheel turned carefully in a lathe, which we supply to wheelwrights at a price cheaper than they can afford to make it.

Price\$1.25

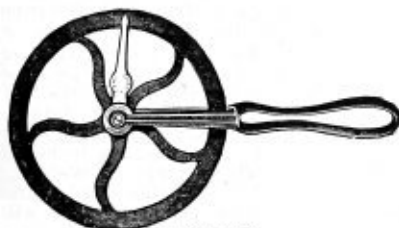


FIG. 2070

HERCULES "PATENTED" POWER HAMMERS ELECTRIC AND BELT DRIVEN

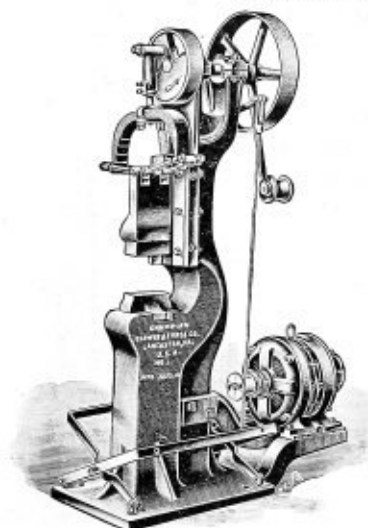


FIG. 2071

Hercules Patented Electrically Driven Power Hammer is identical in every detail with the Hercules Patented Power Hammer listed below; the only difference being that this Hammer is operated by an electric motor. The Motor is placed in such a position on the Hammer as to give a long belt between the motor and the driving pulleys of the Hammer, giving an advantage in power not usually found on an electrically driven Hammer.

This Hammer is furnished with a switch for starting and stopping the motor.

Before ordering a Hercules "Patented" Electrically Driven Power Hammer, ask your electric current manufacturer, whether the current is direct or alternating and the voltage. If alternating, the cycles or alternations and phase.

ELECTRIC DRIVEN HAMMER

No. 0 Hercules "Patented" Electrically Driven Power Hammer, and Current and Voltage. Has one Regular Set of Dies for Plow Work, Upper die $3 \times 1\frac{1}{2}$ ins., Lower Die 3×2 ins. Size of Base of Hammer, 18×25 ins. Height over all 5 ft. 4 ins. Weight of Ram, 30 lbs. Pulley, $9 \times 2\frac{1}{2}$ ins.

Speed, 400 R. P. M. Capacity, 2 ins., Square or Round. Weight 1,150 pounds \$220.00

No. 1 Hercules "Patented" Electrically Driven Power Hammer. Has one Set of Dies $2\frac{1}{2}$ ins. $\times$ $6\frac{1}{2}$ ins. with Plain Surface $2\frac{1}{2}$ ins. $\times$ 3 ins., and Two Plain Grooves and One Tapering Groove Across One End for Forging Round Iron, Straight and Tapering. Size of Base of Hammer, 20 ins. $\times$ 27 ins. Height over all, 5 ft. 8 ins. Weight of Ram, 65 lbs. Pulley, $10 \times 2\frac{1}{2}$ ins. Speed, 300 R. P. M. Capacity $2\frac{1}{2}$ ins., Round or Square. Weight, 1,450 lbs.

Alternating Current, Single Phase, 110 or 220 Volts. 330.00

Alternating Current, Two or Three Phase, or Direct Current, Either 110 or 220 Volts 500.00

EXCLUSIVELY BELT DRIVEN HAMMER

No. 0 Hercules Patented Power Hammer, with One Regular Set of Dies for Plow Work, Upper Die $3 \times 1\frac{1}{2}$ inches, Lower Die 3×2 inches; size of Base of Hammer 18×25 inches; Height over all 5 ft. 4 ins.; Weight of Ram, 30 lbs.; Pulley $9 \times 2\frac{1}{2}$ inches; Speed, 400 R. P. M.; Capacity, 2 inches Square or Round; $\frac{1}{2}$ Horse-power Required to Operate Same; Weight, 900 lbs. Each. 115.00

No. 1 Hercules Patented Power Hammer, with One Set of Dies $2\frac{1}{2} \times 6\frac{1}{2}$ inches, with Plain Surface $2\frac{1}{2} \times 3$ inches, and Two Plain Grooves and One Tapering Groove Across One End for Forging Round Iron, Straight and Tapering; Size of Base of Hammer, 20×27 inches; Height over all 5 feet 8 inches; Weight of Ram, 65 lbs.; Pulley, $10 \times 2\frac{1}{2}$ inches; Speed 300 R. P. M.; Capacity, $2\frac{1}{2}$ inches, Round or Square; 1 Horse-power Required to Operate Same. Weight, 1,250 lbs. Each. 150.00

Any ordinary-shaped Dies can be furnished instead of Regular Dies if specially ordered. Extra Dies for special work will be charged extra.

MINING MACHINE BIT DIES

"TEMPERIN" BRAND

Made from special Tool Steel, with high speed steel hardie. Cut shows combination Die for making either chisel or pick point mining machine bits, including ups and downs.

Unless otherwise specified, dies will be furnished to make bits like those shown below in Fig. 2073.

We furnish bit dies to fit any make of trip hammer.

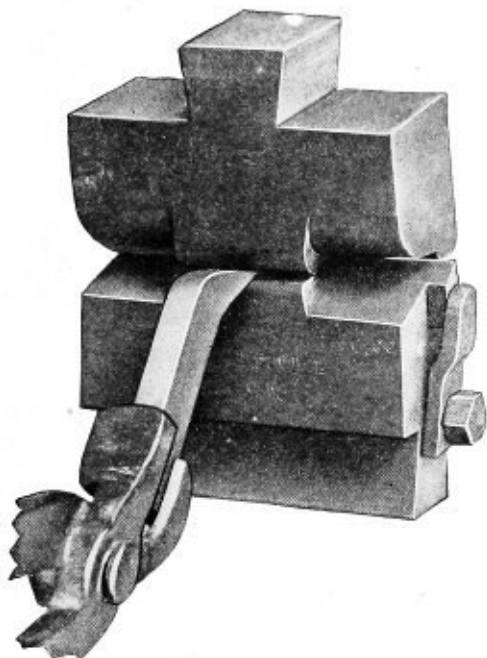


FIG. 2072

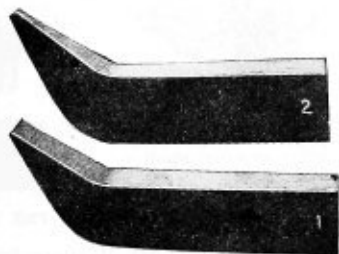


FIG. 2073

Dies for special shape bits made to order promptly.

In ordering, submit sample of bit.

Price, Combination Dies, as shown above\$75.00

LITTLE GIANT POWER HAMMERS

Motor Drive 250 and 500-lb. Models
Belt Drive

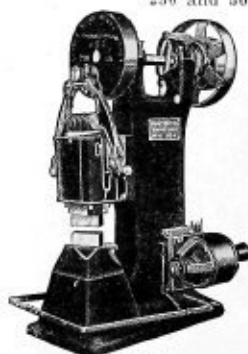


FIG. 2074



FIG. 2075

Pick Point Dies

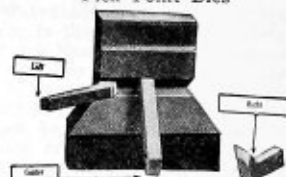
FIG. 2076
Puncher Pick Dies

FIG. 2077

Motor Drive 25, 50 and 100-lb. Models
Belt Drive



FIG. 2078



FIG. 2079

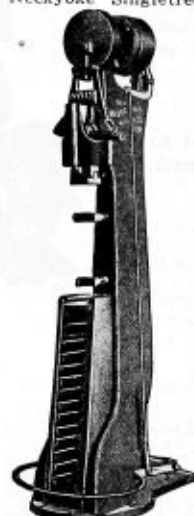


FIG. 2080

LITTLE GIANT POWER HAMMER
for end-ironing singletrees and neckyokes or other similar articles.

Range of material is 18 in. to 52 in. Has adjustable anvil block.

Easy (Helve)



FIG. 2081

Pick Point and Chisel Bit Dies

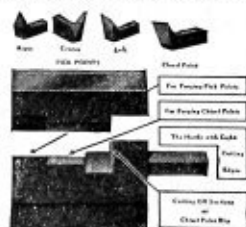


FIG. 2083

Spring Clamp Dies



FIG. 2082

Special dies are furnished with the Little Giant Power Hammer for almost any special forging purpose, and are sold under the same broad guarantee as the Power Hammer itself.

CAROLUS NUT SPLITTERS AND BOLT CLIPPERS

STRAIGHT CUT BOLT CLIPPERS



FIG. 2084

- No. 0A cuts to $\frac{1}{4}$ inch bolts.....each, \$2.50
 No. 1A cuts to $\frac{3}{8}$ inch bolts.....each, 3.50
 No. 2A cuts to $\frac{1}{2}$ inch bolts.....each, 5.00
 No. 3A cuts to $\frac{5}{8}$ inch bolts.....each, 6.75

STRAIGHT AND END CUT BOLT CLIPPERS



FIG. 2085

- No. 0B cuts to $\frac{1}{4}$ inch bolts.....each, \$3.50
 No. 1B cuts to $\frac{3}{8}$ inch bolts.....each, 4.75
 No. 2B cuts to $\frac{1}{2}$ inch bolts.....each, 6.00
 No. 3B cuts to $\frac{5}{8}$ inch bolts.....each, 7.50

NUT SPLITTER WITH STRAIGHT AND END CUT BOLT CLIPPERS



FIG. 2086

- No. 0N cuts to $\frac{1}{4}$ inch bolts and splits nuts from $\frac{1}{4}$ inch
 to $\frac{3}{8}$ inch.....each, \$4.50
 No. 1N cuts to $\frac{3}{8}$ inch bolts and splits nuts from $\frac{1}{4}$ inch
 to $\frac{3}{8}$ inch.....each, 5.75
 No. 2N cuts to $\frac{1}{2}$ inch bolts and splits nuts from $\frac{3}{8}$ inch
 to $\frac{1}{2}$ inch.....each, 7.00

"NEW EASY" BOLT CLIPPERS

No.	Price Each	Weight, Lbs.	Length, In.	To Cut An- nealed Bolts in Thread,
				In.
No. 0				
0	\$3.75	3	18	$\frac{1}{8}$
1	5.00	5 $\frac{3}{4}$	24 $\frac{1}{2}$	$\frac{3}{8}$
2	7.00	9	30	$\frac{1}{2}$
3	9.00	13	36	$\frac{5}{8}$

FIG. 2087

ALLEN-RANDALL BOLT AND RIVET CLIPPERS

		No. 0
		No. 1
		No. 2
		No. 3
		No. 4

FIG. 2088

No.	0	1	2	3	4
Price	each \$3.75	5.00	7.00	9.00	12.00
Weight	lbs. 3 $\frac{1}{4}$	5 $\frac{3}{4}$	9 $\frac{1}{4}$	13	18 $\frac{1}{2}$
Length	in. 18 $\frac{1}{2}$	24	30 $\frac{1}{4}$	36	42
To cut annealed bolts in thread.....in.	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$

BOSTON ELECTRIC WIRE CUTTERS

FOR GENERAL USE (HANDLES INSULATED)



FIG. 2089

The Boston Electric Wire Cutters are for General Use and have insulated handles.

If used for cutting bolts or rivets, the heel, not the point of the jaws, should be employed.

	No. 0	No. 1	No. 2	No. 3
List price	\$5.50	6.50	9.00	12.00
Weight	pounds $3\frac{1}{2}$	$5\frac{1}{4}$	$8\frac{3}{4}$	$13\frac{1}{2}$
Length	inches $18\frac{1}{2}$	$24\frac{1}{2}$	$30\frac{1}{4}$	$36\frac{1}{8}$
Opening	inches $\frac{5}{16}$	$\frac{3}{4}$	$1\frac{1}{8}$	$1\frac{3}{4}$

MAUD S. PINCERS



FIG. 2090

Size	inches	12	14	16
List	per dozen	\$22.00	24.00	30.00

CLINCH TONGS



FIG. 2091



FIG. 2092

USEFUL ON COLTS AND NERVOUS HORSES

Round or straight ends.....list, per dozen \$26.40

BLACKSMITHS' TOOLS

"OUR PRIDE" HOOF SHEAR



FIG. 2093

List price.....per dozen pair, complete, \$56.00

" " extra knives....." " 13.00

Knives are right and left, and packed 6 pair in box.

HOOF PARERS

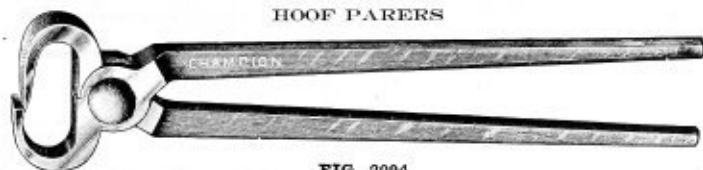


FIG. 2094

List price, 12 inch...per dozen, \$24.00 List price, 14 inch...per dozen, 28.80

NAIL CUTTING NIPPERS



FIG. 2095

Solid cast steel, full polished—

Size	8	10	12	14
List price.....per dozen	\$14.40	19.20	24.00	28.80

"FAVORITE" PINCHER



FIG. 2096

Drop Forged. Handles polished and blued. Polished head. Square jaw especially designed to be used as a clinch block.

List price, 14 inch.....per dozen, \$32.00

" " 16 " " 40.00

FARRIERS' TONGS



FIG. 2097

To hold Horseshoes. Also made in light weight.

No.	40	40A	40B	40C
Size inches	12	14	16	18
Price per dozen	\$5.50	6.00	6.30	6.60

BLACKSMITHS' TONGS



FIG. 2098

To hold Flats.

No.	41	41A	41B	41C	41D	41E	41F	41G	41H	41I
Size inches	12x0	14x0	16x0	18x1/4	20x1/2	22x3/4	24x1	26x1 1/4	28x1 1/4	30x1 1/4
Price dozen	\$6.00	6.30	6.60	6.80	7.30	7.80	8.80	9.30	9.80	10.20

BLACKSMITHS' PICK-UP TONGS



FIG. 2099

For Hot Metal.

No.	42	42A	42B	42C	42D
Size inches	18	20	22	24	26
Price per dozen	\$9.80	10.10	10.50	11.60	12.70

BLACKSMITHS' "V" SHAPED TONGS



FIG. 2100

To Hold Squares.

No.	43	43A	43B	43C	43D
Size inches	18x1/4	20x1/2	22x3/4	24x1	26x1 1/4
Price per dozen	\$8.20	8.90	10.20	10.80	11.40

BLACKSMITHS' CURVED LIP FLUTED JAW TONGS



FIG. 2101

TO HOLD BOLTS AND ROUNDS

No.	44	44A	44B	44C	44D
Size.....inches	18x1 $\frac{1}{4}$	20x1 $\frac{1}{2}$	22x3 $\frac{3}{4}$	24x1	26x1 $\frac{1}{4}$
Price.....per dozen	\$8.20	8.90	10.20	10.80	11.40

BLACKSMITHS' BRAZING TONGS



FIG. 2102

TO HOLD BAND SAWS

No. 45, size 18 inches.....price per dozen \$8.00

BLACKSMITHS' GAD TONGS



FIG. 2103

FOR GENERAL FORGING PURPOSES

No.	46	46A	46B	46C	46D
Size.....inches	18	20	22	24	26
Price.....per dozen	\$8.20	8.90	10.20	10.80	11.40

TOE CALK DIE

No. 106



FIG. 2104

No. 107



FIG. 2105

No. 106 Small Toe Calk Welding Die for Nos. 0, 1, 2 and 3 Toe Calks. Shanks for one-inch anvil hole; weight, 57 lbs. per dozen.

List priceper dozen \$12.00

No. 107 Large Toe Calk Welding Die, for Nos. 3, 4, 5 and 6 Toe Calks. Shanks for one-inch anvil hole; weight, 75 lbs. per dozen.

List priceper dozen \$18.00

BLACKSMITHS' ANVIL TOOLS

Cold Chisel Hot Chisel Hardie Round Punch Square Punch Set Hammer



FIG. 2106



FIG. 2107



FIG. 2108



FIG. 2109



FIG. 2110



FIG. 2111

COLD CHISELS

Size	inches	1	1½	1¾	1¾	1½	1¾
Weight	lbs.	1¼	1½	1¾	2¼	3	4¼
Price	per lb.	\$0.50	.50	.50	.50	.50	.50

HOT CHISELS

Size	inches	1	1½	1¾	1¾	1½	1¾
Weight	lbs.	1¼	1½	1¾	2¼	2¾	4¾
Price	per lb.	\$0.50	.50	.50	.50	.50	.50

HARDIES

Size	inches	½	¾	¾	¾	1	1½	1¾
Weight	lbs.	½	¾	1	1¼	1½	2¼	2½
Price	per lb.	\$0.50	.50	.50	.50	.50	.50	.50

ROUND EYE PUNCHES

Size	inches	¼	⅜	½	⅝	¾	¾	¾	1
Weight	lbs.	1¼	1¼	1¾	1¾	2	2¼	2¾	3
Price	per lb.	\$0.50	.50	.50	.50	.50	.50	.50	.50

SQUARE EYE PUNCHES

Size	inches	¼	⅜	½	⅝	¾	¾	¾	1
Weight	lbs.	1¼	1½	1½	1¾	1¾	2¼	2¾	3¼
Price	per lb.	\$0.50	.50	.50	.50	.50	.50	.50	.50

SET HAMMERS

Size	inches	1	1¼	1¾	1¾	1¾	2
Weight	lbs.	1	2	2¼	2¾	4	4¾
Price	per lb.	\$0.50	.50	.50	.50	.50	.50

Prices given are without handles.

BLACKSMITHS' ANVIL TOOLS

Top Swage



FIG. 2112

Bottom Swage
Shank for 1-inch anvil holeFIG. 2113
TOP AND BOTTOM SWAGES

Top Fuller



FIG. 2114

Bottom Fuller



FIG. 2115

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$
Weight Top Swages.....	lbs.	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$2\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$3\frac{1}{4}$
Weight Bottom Swages.....	lbs.	$2\frac{1}{8}$	$2\frac{1}{8}$	$2\frac{1}{8}$	$2\frac{1}{8}$	$2\frac{1}{8}$	$2\frac{1}{8}$	$2\frac{1}{8}$	$2\frac{1}{8}$	$2\frac{1}{8}$
Price	per lb.	\$0.50	.50	.50	.50	.50	.50	.50	.50	.50

Size	inches	$1\frac{1}{8}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{2}$
Weight Top Swages.....	lbs.	$3\frac{1}{4}$	$3\frac{1}{4}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$
Weight Bottom Swages.....	lbs.	$2\frac{3}{4}$	$2\frac{3}{4}$	$3\frac{5}{8}$	$3\frac{3}{4}$	$3\frac{3}{4}$	$5\frac{1}{4}$	$5\frac{1}{4}$	$5\frac{1}{4}$	$5\frac{1}{4}$
Price	per lb.	\$0.50	.50	.50	.50	.50	.50	.50	.50	.50

TOP FULLER

Size	in.	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$
Weight	lbs.	$2\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{1}{2}$	3	$3\frac{1}{4}$	$3\frac{1}{4}$	$3\frac{3}{4}$	4	$4\frac{1}{2}$	$5\frac{1}{2}$
Price	per lb.	\$0.50	.50	.50	.50	.50	.50	.50	.50	.50	.50	.50	.50	.50

BOTTOM FULLER

Size	in.	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$
Weight	lbs.	2	2	2	$2\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{3}{4}$	3	3	$3\frac{1}{2}$	$4\frac{1}{4}$	5	$5\frac{1}{4}$
Price	per lb.	\$0.50	.50	.50	.50	.50	.50	.50	.50	.50	.50	.50	.50	.50	.50

FLATTER

Size	inches	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{2}$	4
Weight	lbs.	2	$2\frac{3}{4}$	4	4	5	5	$7\frac{1}{4}$
Price	per lb.	\$0.50	.50	.50	.50	.50	.50	.50

Flatter



FIG. 2116

Heading Tool

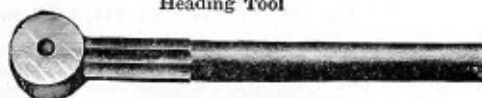


FIG. 2117

HEADING TOOL

Size	inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Weight	lbs.	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$3\frac{5}{8}$	$3\frac{5}{8}$	$3\frac{5}{8}$	$3\frac{5}{8}$
Price	per lb.	\$0.50	.50	.50	.50	.50	.50	.50

"HAY-BUDDEN" SOLID WROUGHT ANVILS



FIG. 2118

List of advances charged for "Hay-Budden" Solid Wrought Anvils from 10 to 800 lbs.

REGULAR BLACKSMITHS ANVILS

Farrier Plain Horn	Base
80 to 425 lbs.	"
425 to 625 lbs.	1½c per lb. extra
625 to 800 lbs.	2 " "
70 to 79 lbs.	1½ " "
60 to 69 lbs.	1 " "
50 to 59 lbs.	2 " "
40 to 49 lbs.	3 " "
30 to 39 lbs.	5 " "
20 to 29 lbs.	8 " "
10 to 19 lbs.	15 " "

SPECIAL HAY-BUDDEN ANVILS	Base
Farrier Clip Horn	1c per lb. extra
Farrier Swelled Plain Horn	1½ " "
Farrier Swelled Clip Horn	2 " "
Plowmaker	1½ " "
Blacksmith Plowmaker	1 " "
Double Horn	2 " "
Hornless	" "
Sawmakers	½ " "
Steel Polished Horn, Farriers' Pattern	4 " "
Steel Polished Horn, Clip Horn Pattern	5 " "
Coopers' Beck Iron, Prices according to dimensions	" "

PETER WRIGHT'S BLACKSMITHS' ANVILS



FIG. 2119

Weights from

84 to 350 lbs.	per lb.,	...
350 to 600 lbs.	per lb.,	...
70 to 84 lbs. advance	per lb.,	1c
60 to 69 lbs. advance	per lb.,	1½c
50 to 59 lbs. advance	per lb.,	2c
Under 50 lbs. advance	per lb.,	3c

BLACKSMITHS' BELLOWS

Hardwood outside boards, cross cleated, painted red; Japanned Sheet Steel cap and funnel; 5 leaf pattern with cowhide split leather sides and folds.

Unless otherwise specified standard always shipped.



FIG. 2120

STANDARD			STANDARD, EXTRA LONG		
Width, Inches	Length, Inches	List Price, Each	Width, Inches	Length, Inches	List Price, Each
24	34	\$10.00	30	50	\$15.00
26	37	11.00	32	54	17.00
28	40	12.00	34	58	19.00
30	43	13.00	36	64	21.00
32	46	14.00	38	68	24.00
34	50	16.00	40	72	28.00
36	54	18.00	42	73	34.00
38	58	20.00	44	76	40.00
40	62	23.00	46	82	45.00
42	67	27.00	48	85	50.00
44	70	32.00	50	91	60.00

"20 MULE TEAM" BRAND BORAX

Pure Pulverized Borax for Welding Purposes

Price per lb. \$0.30

ROSIN

Lump per lb. \$

Pulverized per lb.



FIG. 2121

CHERRY HEAT WELDING COMPOUND

Coarse Granulated Mixture for Steel, Iron or Malleable Iron

In wood boxes containing.....lbs.	25	50	100
List price .....per lb.	\$0.25	.25	.25

CLIMAX WELDING COMPOUND

In boxes containing.....lbs.	25	50	100
List price .....per lb.	\$0.20	.20	.20

Sold only in full boxes.

"E-Z" WELDING COMPOUND

is by far the best welding compound on the market. It adheres to the metal at a low heat and does not boil up and roll off while fluxing like borax compounds. It welds equally good tool, open hearth or Bessemer steel and makes smoother and stronger welds than any other at fully 250 degrees lower heat than any other flux known.

5 and 10-pound boxes.....per pound,	\$0.25
25 and 50-pound boxes.....per pound,	.25
100-pound drums .....per pound,	.15
Half barrels .....per pound,	.14
Barrels .....per pound,	.12



PAT. MAY 27, 1902
FIG. 2122

LAFFITTE WELDING PLATES, ETC.

Welding Plates



FIG. 2123

LAFFITTE WELDING PLATES, 4 X 8 INCHES

These plates lower your costs, improve your work, and do what you cannot do now. The chemical action of the plate increases the strength of the weld. You can weld at a low heat. It will save you 33 per cent in time and fuel. Used in the simplest manner, the two pieces being heated to a cherry red if steel, or a white heat if iron. Plate of sufficient size is placed between the parts to be welded; press them together until the plate fuses, hammer lightly and complete by hammering in the usual way. The pieces may be reheated to any desired heat without endangering weld.

Heavy Platesper hundred, \$.....
 Light Platesper hundred, \$.....

Packed 10 in a box.

LAFFITTE WELDING POWDER

Used in exceptional cases where the rigidity of the plate does not lend itself to the work to be done, such as welding in a hole, cementing a flaw, etc.

Price, 1-lb. cans, 5-lb. cans, 55-lb. sacks.....\$.....

LAFFITTE BRAZING POWDER

Used as ordinary borax, but 1 pound does the work of 4 pounds of borax. The copper solder, which it is always necessary to add, is not displaced.

Price, 1-lb. cans\$.....
 Price, 2½-lb. cans\$.....

LAFFITTE TEMPERING POWDER

For tempering tools at a low heat. Tempers iron to the hardness of steel. Makes steel as hard as high carbon steel and cast steel, also unsurpassed for case hardening. In 1-lb. and 2½-lb. cans. Price.....\$.....

No. 1 for Brazing Brass
 Red Copper and Bronze



FIG. 2125

No. 2 for Brazing Red No. 3 for Brazing Iron
 Copper and Iron and Steel

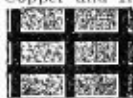


FIG. 2126



FIG. 2127

LAFFITTE BRAZING PLATES

Designed to do away with the use of borax and contains all the necessary ingredients for a perfect braze, including the right proportion of spelter.

Nos. 1, 2, and 3 qualities melt at different temperatures, enabling the brazier to have a spelter which fuses at a lower heat than the metal to be brazed. Does quick, clean and better work. Does away with swelling and blistering, which causes a great waste of copper solder. Leaves the braze free from oxides and residues, ready for finishing.

No. 3 Brazing Plates are used extensively for brazing high speed steel to mild steel.

Price, 1-lb. box No. 1 and No. 2.....\$.....
 Price, 1-lb. box No. 3\$.....
 Price, 2-lb. box No. 1 and No. 2.....\$.....
 Price, 2-lb. box No. 3\$.....

Showing Method of
 Applying the Laffitte
 Welding Plate

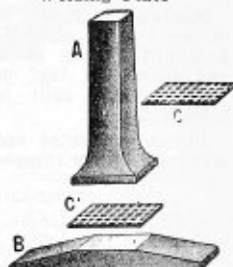


FIG. 2124

TEMPERIN

Increases the strength and life of the cutting edge of tools, bits, picks, etc. Temperin will not work in alkali water. Hot steam water or hot soft water must be used. Dissolve $\frac{1}{2}$ pint in 3 gallons of water. Good until used.

Put up in 50-lb. cans. Price.....each, \$12.50



FIG. 2128

DAMASCUS TEMPERING SOLUTION

The New Way



FIG. 2129

Tools, Bits, Picks, Chisels and Drills tempered with Damascus Tempering Solution will add from 50 to 100 per cent in efficiency.

Any Blacksmith that can temper in water becomes an expert temperer, when he uses Damascus Tempering Solution.

Damascus Tempering Solution will reduce your steel expense. It has done it for others and it will for you.

Put up in:

Kegs, containing about 10 gallons; weight, 95 lbs.....	per lb.,	\$0.10
Half Barrels, containing about 30 gallons; weight, 250 lbs.....	per lb.,	.10
Barrels, containing about 50 gallons; weight, 450 lbs.....	per lb.,	.10

FARRIERS' HAMMERS

PLAIN EYE

No. 170. Plain

No. 180. Octagon

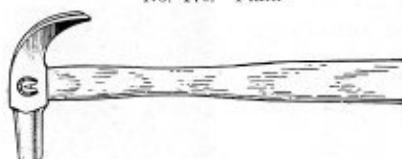


FIG. 2130

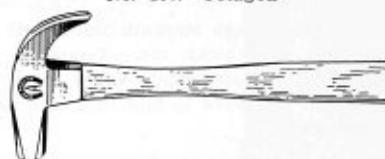


FIG. 2131

No. 170—Curved Claw, Plain Poll, Polished, Hickory Handle. Weight, 7 ounces; length over all, 12 inches.

Listper dozen, \$8.25

No. 180—Curved Claw, Octagon Poll, Polished, Hickory Handle. Weight, 7 ounces; length over all, 13 inches.

Listper dozen, \$7.50

CLEAN CLAW DRIVING HAMMER

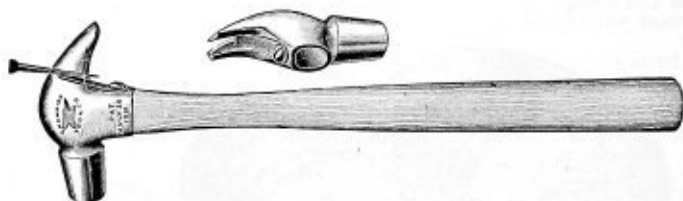


FIG. 2132

No. 87—Round Poll, Drop Forged, Polished. Claw is always clean. Spring makes that positive. Compact in design, which insures correct swing and good blow. 12 to 20 oz. including handle.

Extra springs, listper dozen, \$ 1.00

Listper dozen, 22.50

FARRIERS' TURNING HAMMERS

No. 480

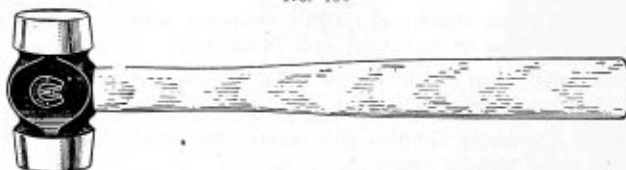


FIG. 2133

No.	480	481	482	483
Weight .....lbs.	2	2 1/4	2 1/2	2 3/4
Length over all .....in.	15	15	15	15
List .....per dozen	\$30.00	30.00	30.00	30.00

Weights given do not include handles.

BESTOVALL HORSE SHOE NAILS



FIG. 2134

The superiority of this brand has been fully demonstrated. They never crimp in driving in the hardest hoof, are flexible to clinch and twist. They never split in driving, don't break under the heads and hold the shoe until it is worn out. Made from especially imported Swedish iron.

Nos.	5	6	7	8	9
List prices .....per lb.	\$0.28	.25	.24	.23	.22

CAPEWELL HORSE SHOE NAILS

Nos.	3	4	4½	5	6	7	8	9	10	11
List prices .....per lb.	\$1.53	.53	.48	.28	.25	.24	.23	.22	.22	.21

"The Capewell" will last until the shoe is worn out.

Even in fly time "The Capewell" will stand the strain of restless stamping where all other nails fall.

"FORT PITT" IRON HORSE AND MULE SHOES

We desire to call your attention to the following merits of the "Fort Pitt" brand of horse and mule shoes:

The Material: Our shoes are made from the very best refined wrought iron. All material entering into our bars is carefully selected and the quality of this iron is such as to render the best kind of service for a horse shoe.

Patterns and Shapes: The most approved ideas of practical horse shoers are embodied in the patterns of the "Fort Pitt" Horse Shoes. Their shape is on correct lines, enabling the smith to fit them with the least possible labor.

The Creasing: The creasing is proper, and so formed as to hold the nail firmly when driven home.

Nail Holes: The nail holes are so arranged with reference to the distance apart at the toe as to meet the requirements of the various localities in which the shoe is sold.

The Concaving: The front shoes are concaved so as to prevent the sole of the hoof from coming into contact with the shoe, thus preserving its elastic properties.

The Punching: Each shoe is punched clear through at proper angles to prevent the nails from sheering from their proper course. All burrs are removed, which is quite an advantage to the smith.

The Finish: The shoes are smooth and uniform, rendered so by the latest improved presser. This makes the shoe attractive to the eye and cleanly to handle.

Inspection: Each shoe is closely inspected when finished and any shoe showing the slightest imperfection in any way is thrown out, thereby insuring every shoe in the keg to be perfect, which adds materially to the cost of production.

Tests: Tests of the "Fort Pitt" Shoes show that they can be twisted like a rope, and bent back double without the slightest tendency to crack. We guarantee that the "Fort Pitt" Shoes will stand any test that any other make of shoe will, and we recommend these shoes to you strictly on their merits

We also furnish "Fort Pitt" shoes in steel.

HORSE AND MULE SHOES

EXTRA LIGHT-IRON OR STEEL

This pattern of shoe is intended for the lightest shoeing, when it is not necessary to calk the shoe. It has the nail holes set farther front than the other patterns shown. A good shoe to use in sandy soils and on smooth roads.

Front



FIG. 2135

Hind



FIG. 2136

FRONT

Size	Weight Each Shoe, Oz.	Average No. in Ea. Keg
0	11	145
1	13	123
2	15½	103
3	18½	86
4	22	73
5	25½	63
6	30	53
7	36	44

HIND

Size	0	1	2	3	4	5	6	7
Weight of each shoe.....ounces	9	10½	13	16	19½	23	27	32
Average number to each keg	177	152	123	100	82	70	59	50

LIGHT IRON OR STEEL

This pattern is adapted to country and light shoeing generally. It is a heavier shoe than the extra light, and has the nail holes set farther back from the toe, so as to permit the jumping on of a calk without weakening the shoe. It is a good shoe to use for light driving in the country where the roads are macadamized or rough and stony.

Front



FIG. 2137

Hind



FIG. 2138

FRONT

Size	W't of Each Shoe, Oz.	Avg'e No. in Each Keg	Size	W't of Each Shoe, Oz.	Avg'e No. in Each Keg
0	12	133	0	10	160
1	14	114	1	12	133
2	17	94	2	14½	110
3	21	76	3	18½	86
4	25	64	4	22	73
5	30	53	5	27	59
6	36	44	6	31	51
7	42	38	7	35	46
8	46	35	8	40	40

HIND

MEDIUM IRON OR STEEL

This shoe is a larger and heavier shoe than the light. It is well suited for draft horses on the rough and rocky roads of the country. Also well suited for the paved streets of the city, except where it is desired to turn up an extra heavy heel, then we recommend our Long Heel Medium.

Front



FIG. 2139

Hind



FIG. 2140

FRONT

Size	W't of Each Shoe, Oz.	Avg'e No. in Each Keg	Size	W't of Each Shoe, Oz.	Avg'e No. in Each Keg
0	13	123	0	10½	152
1	17	94	1	14	114
2	20	80	2	16	100
3	25	64	3	20	80
4	29	55	4	24	67
5	35	46	5	29	55
6	41	39	6	34	47
7	47	34	7	39	41
8	55	29	8	45	35

HIND

Packed in 100-lb. Kegs. Front or Hind separate or Front and Hind mixed. Usual extras for mixed sizes.

FOR LIST OF ADVANCES, SEE PAGE 809

HORSE AND MULE SHOES—CONTINUED

LIGHT LONG HEEL--IRON OR STEEL



FIG. 2141

This is same pattern as Light Shoe except that the heels are fully one-half inch longer. The nail holes are likewise set back so as to permit the jumping on of a large calk. Well adapted to use on granite or paved streets for light shoeing.

FRONT

Size	2	3	4	5	6	7
Wgt. ea. Shoe, oz.	19	22½	27	33	39	46
Av. No. in ea. Keg	84	71	59	48	41	34

HIND

Size	2	3	4	5	6	7
Wgt. ea. Shoe, oz.	17	20	25½	30	34	38
Av. No. in ea. Keg	94	80	63	53	47	42



FIG. 2142

MEDIUM LONG HEEL--IRON OR STEEL



FIG. 2143

This shoe is the same pattern and shape as our Medium, with the heels fully a half inch longer, so as to permit the turning up of an extra heavy heel, and is extra strong in the toe, so as to allow the jumping on of a large toe calk. It is well adapted for use on the granite streets of the city.

FRONT

Size	Wgt. of Each Shoe, Oz.	Av'ge No. in Each Keg	Size	Wgt. of Each Shoe, Oz.	Av'ge No. in Each Keg
3	28	57	3	24	67
4	32	50	4	29	55
5	38	42	5	34	47
6	46	35	6	40	40
7	53	30	7	46	35
8	58	27	8	52	30



FIG. 2144

SNOW--IRON OR STEEL



FIG. 2145

This is a special shoe made in the Light pattern, well adapted for use in winter to prevent the snow from bailing under the horse's foot. It is made with a round bevel, and is also a good shoe to use on muddy roads, especially in clay soil.

FRONT

Size	Wgt. of Each Shoe, Oz.	Av'ge No. in Each Keg	Size	Wgt. of Each Shoe, Oz.	Av'ge No. in Each Keg
0	10	100	0	9	177
1	12	133	1	10	160
2	14	114	2	12	133
3	18	90	3	15	107
4	22	73	4	19	85
5	28	58	5	25	64
6	34	47	6	29	55
7	40	40	7	33	48



FIG. 2146

Packed in 100-lb. Kegs. Front or Hind separate or Front and Hind mixed. Usual extras for mixed sizes.

FOR LIST OF ADVANCES, SEE PAGE 809

HORSE AND MULE SHOES—CONTINUED



FIG. 2147

This pattern is adapted for service on rocky roads and paved streets. Heavy enough for draft purposes.

Mule Light is made in the three popular sizes only. Adapted for farm use and sandy roads, where it is not necessary to use such a heavy shoe.

MULE			MULE LIGHT		
Size	Weight of Each Shoe	Average No. in Each Keg	Size	Weight of Each Shoe	Average No. in Each Keg
00	8 oz.	200	.....	.....	.....
0	9 "	178	.....	.....	.....
1	12 "	133	1	10 oz.	160
2	14 "	114	.....	.....	.....
3	18 "	89	2	12 oz.	133
4	22 "	73	.....	.....	.....
5	27 "	59	3	15 oz.	107
6	31 "	51	.....	.....	.....

Packed in 100 lb. kegs. Front or hind separate or front and hind mixed.

LIST OF ADVANCES ON

Horse Shoes, Extra Light, Light, Medium, Heavy, Long Heel, Short Heel, City Pattern and Snow Shoes, also Mule Shoes, No. 2 and larger.

	Per Keg Advance Over Base
Horse Shoes, sizes No. 1 and smaller	\$0.25
Mule Shoes, No. 1	.25
" " " 00 and 0	1.50
Light Driving Horse Shoes, No. 2 and larger	.75
" " " 1 " smaller	1.00
Bronco Shoes, Turned Heel, No. 2 and larger	1.25
" " " Nos. 00, 0 and 1	1.50
" " Flat Heel, No. 2 and larger	.75
" " " 00, 0 and 1	1.00
Jack Shoes, all sizes	2.50
Usual extras for mixed sizes, or broken kegs.	



FIG. 2143

NEVERSLIP HORSE SHOES

IRON "B" PATTERN

Packed 100 lbs. to Keg, or 5 Sets to Box. Blank Shoes in Kegs Only.

Sizes	0	1	2	3	4	5	6	7	8
Largest Calk	in.	$\frac{3}{8}$	$\frac{7}{8}$	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{5}{8}$
Blank	per lb.								
Drilled	per lb.								
Drilled	per set								
Calked and Clipped	per set								

NEVERSLIP SCREW CALK NO. 4

Sizes	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$
Price	per doz.	\$..	..	..	..	..

NEVERSLIP STEEL DRIVING SHOES AND CALKS

Packed 100 lbs. to keg or 5 sets to box.

Sizes	2	3	4	5	6	7	8
Largest Calk, in.	$\frac{1}{16}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$
Per Set	per doz.	\$..	..	..	..	..	..



FIG. 2150

CALKS

Size	inches	$\frac{1}{16}$	$\frac{1}{2}$	$\frac{3}{16}$	$\frac{5}{8}$
Price	per doz.	\$..	..	..	..

FIG. 2149
Calk

FIG. 2151

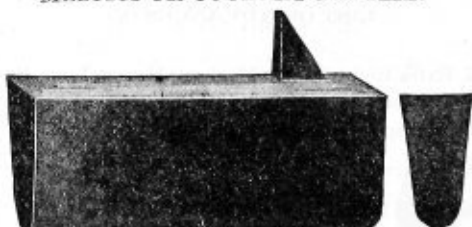
JUNIATA TOE CALKS
MEDIUM OR COUNTRY PATTERN

FIG. 2152

Size	Regular	Long	Extra Long
No. 0	$1\frac{3}{4} \times 1\frac{1}{2} \times \frac{1}{8}$	$1\frac{3}{4} \times 1\frac{1}{2} \times \frac{1}{8}$	$1\frac{3}{4} \times 1\frac{1}{2} \times \frac{1}{8}$
No. 1	$1\frac{3}{4} \times 1\frac{1}{2} \times \frac{1}{8}$	$1\frac{3}{4} \times 1\frac{1}{2} \times \frac{1}{8}$	$2 \times 1\frac{1}{2} \times \frac{1}{8}$
No. 2	$1\frac{3}{4} \times 1\frac{1}{2} \times \frac{1}{8}$	$2 \times 1\frac{1}{2} \times \frac{1}{8}$	$2\frac{1}{4} \times 1\frac{1}{2} \times \frac{1}{8}$
No. 3	$2 \times 1\frac{1}{2} \times \frac{1}{8}$	$2\frac{1}{4} \times 1\frac{1}{2} \times \frac{1}{8}$	$2\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{8}$
No. 4	$2\frac{1}{4} \times 1\frac{1}{2} \times \frac{1}{8}$	$2\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{8}$	$2\frac{3}{4} \times 1\frac{1}{2} \times \frac{1}{8}$
No. 5	$2\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{8}$	$2\frac{3}{4} \times 1\frac{1}{2} \times \frac{1}{8}$	$3 \times 1\frac{1}{2} \times \frac{1}{8}$
No. 6	$2\frac{3}{4} \times 1\frac{1}{2} \times \frac{1}{8}$	$3 \times 1\frac{1}{2} \times \frac{1}{8}$	$3\frac{1}{4} \times 1\frac{1}{2} \times \frac{1}{8}$
No. 7	$3 \times 1\frac{1}{2} \times \frac{1}{8}$	$3\frac{1}{4} \times 1\frac{1}{2} \times \frac{1}{8}$	$3\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{8}$

BILLINGS' DOUBLE ACTING RATCHETS

MODEL A. E. E. NOS. 1 AND 2

For Square Shank Drills.

Has reversible pawl. Furnished with either hexagon or knurled sleeve.

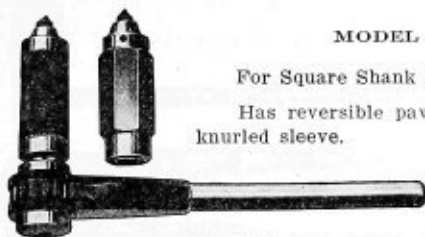


FIG. 2153

No.	Length of Handle Inches	Size of Drill Socket	For Morse Sq. Taper Drills, Inches	Length of Head, Inches	Feed Inches	Weight Pounds	Price Each
1	10½	No. 1 Morse	¾ to 1½	6½	1½	4½	\$11.00
2	13	No. 2 Morse	¾ to 1¾	7¾	1¾	6¾	14.00

MODEL A. H. NOS. 1 AND 2

With Round Taper Hole in Socket.

This drill can be changed from right to left hand drilling by simply moving the pawl to left or right.

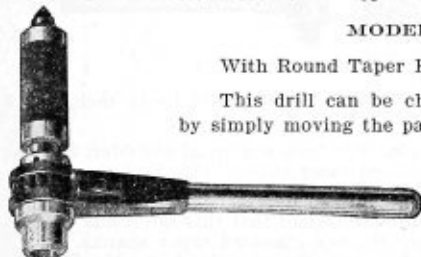


FIG. 2154

No.	Length of Handle Inches	Size of Drill Socket	For Morse Taper Drills, Inches	Length of Head, Inches	Feed Inches	Weight Pounds	Price Each
1	10½	No. 2 Morse	¾ to 1½	7¼	1½	4¾	\$11.00
2	13	No. 3 Morse	¾ to 1¾	8¾	1¾	7	14.00

BILLINGS' DOUBLE ACTING RAILROAD RATCHET

MODEL A. H. H. NOS. 3 AND 5

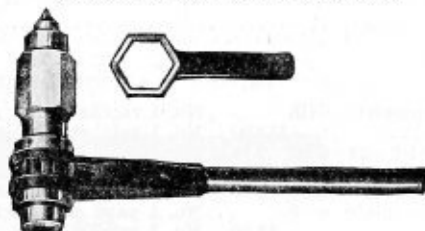


FIG. 2155

Adapted for hard work, such as drilling nickel steel rails. A special feed wrench for the hexagon sleeve is furnished with each ratchet.

No.	Length of Handle Inches	Size of Drill Socket	Length of Head, Inches	Feed Inches	Weight Pounds	Price Each
3	15	Morse No. 2 Square Taper	9	3¼	12*	\$22.00
5	20½	Morse No. 2 Square Taper	11	3½	17¼*	30.00

*Weight includes wrench.

THE RENSHAW RATCHET DRILL



FIG. 2156

These tools are made in two sizes—No. 1 taking drills to $\frac{1}{2}$ inch, No. 3 taking drills to $1\frac{1}{2}$ inches.

No. 1 has one collet for drills, with shank $\frac{1}{4}$ inch square at shoulder, and one collet for drills fitting No. 1 Morse's standard taper socket.

No. 3 has one collet, No. 5, for drills, with shank $\frac{5}{8}$ square at shoulder, of $\frac{1}{2}$ to $1\frac{1}{2}$ inches diameter, which are the extreme sizes that this ratchet is adapted to carry, and collets Nos. 1, 2 and 3, for Morse's standard taper shanks. No. 3 and No. 5 collets are held in the spindle by screw thread. No. 1 and No. 2 collets are tapered externally to fit No. 3 socket.

Collets for No. 3 Ratchet for taper square shank drills $\frac{3}{4} \times \frac{1}{2} \times 1\frac{3}{4}$ inches long also furnished at price of $\frac{3}{8}$ collet.

	No. 1	No. 3
Length of handle over all.....	9 $\frac{1}{2}$ in.	18 in.
Depth from top feed screw to bottom of collet.....	2 $\frac{1}{2}$ in.	5 in.
Full depth of feed.....	1 $\frac{1}{2}$ in.	2 $\frac{3}{4}$ in.

PRICE LIST

No. 1 ratchet drill complete, with two collets	\$11.00	No. 1 ratchet body	each	\$2.20
No. 1 ratchet drill, with one collet	9.40	No. 1 ratchet body nut	each	.40
No. 1 collet, with square or taper hole	each 1.60	No. 1 feed screw	each	2.00
No. 3 ratchet drill complete, with four collets	15.00	No. 1 feed pin	each	.30
No. 3 ratchet drill, with No. 3 or No. 5 collet only.....	11.05	No. 1 ratchet handle	each	3.00
No. 3 ratchet drill, with Nos. 1, 2 and 3 collets only.....	13.25	No. 1 pawl and spring.....	each	.40
No. 1 or No. 2 collet for No. 3 ratchet	each 1.10	No. 3 ratchet body	each	3.00
No. 3 or No. 5 collet for No. 3 ratchet	each 1.75	No. 3 ratchet body nut.....	each	.50
		No. 3 feed screw	each	3.00
		No. 3 extension feed screw.....	each	3.50
		No. 3 feed pin	each	.75
		No. 3 ratchet handle	each	4.75
		No. 3 pawl and spring.....	each	.50
		No. 3 friction feed attachment	each	3.00



FIG. 2157

IMPROVED PACKER RATCHET DRILLS HARDENED ALL OVER FOR MORSE AND SQUARE TAPER SHANK DRILLS

PACKER RATCHETS WITH SQUARE TAPER SOCKETS

No.	Length	Size of Drill Socket	Length of Head	Feed	Price, Each
1	10-in.	No. 1 Square Taper*	6 in.	2 1/4 in.	\$4.75
2	12 "	" 1 " "	6 3/4 "	2 1/2 "	6.00
3	15 "	" 1 " "	7 1/4 "	3 "	7.25
4	18 "	" 2 " "	9 "	3 1/2 "	8.50
5	21 "	" 2 " "	9 3/4 "	4 "	10.25

*No. 1 or small socket is 3/4 inch square at small end and 5/8 inch square at large end.

†No. 2 or large socket is 1/2 inch square at small end and 3/4 inch square at large end.

PACKER RATCHETS WITH MORSE TAPER SOCKETS

No.	Length	Size of Drill Socket	Takes Morse Taper Drills	Length of Head	Feed	Price, Each
1-M	10-in.	No. 2 Morse	27 to 32	6 in.	2 1/4 in.	\$5.75
2-M	12 "	" 3 "	32 to 38	6 1/4 "	2 1/2 "	7.25
3-M	15 "	" 3 "	38 to 44	7 1/4 "	3 "	9.00
4-M	18 "	" 4 "	44 to 50	9 "	3 1/2 "	11.25
5-M	21 "	" 4 "	50 to 56	9 3/4 "	4 "	13.50
6-M	30 "	" 5 "	56 to 64	12 1/2 "	4 1/2 "	20.00

By means of sleeves and sockets, Packer Ratchets with Morse Taper Sockets can be made to take smaller sized drills, and drills with square taper shanks.



FIG. 2158

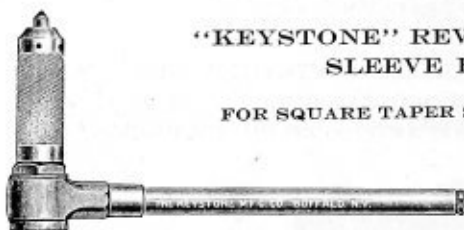
IMPROVED PACKER BOILER RATCHET DRILLS WILL OUTWEAR TWO OF THE SOFT KIND

No small screws. Spindle bears on a strong collar nut. Pawl drives on drill shank, not above it.

No.	Length	Size of Drill Socket	Length of Head	Feed	Price, Each
1-B	10-inch	No. 1 Square Taper*	4 3/8 inches	1 1/2 inches	\$4.00
2-B	12 "	" 1 " "	5 "	1 3/4 "	4.75
3-B	15 "	" 1 " "	5 1/2 "	2 "	7.25
4-B	18 "	" 2 " "	6 "	2 1/4 "	8.50
5-B	21 "	" 2 " "	6 1/2 "	2 1/2 "	10.25

*No. 1, or small drill socket, is 3/4 inch square at small end and 5/8 inch square at large end.

†No. 2, or large drill socket, is 1/2 inch square at small end and 3/4 inch square at large end.



"KEYSTONE" REVERSIBLE SQUARE SLEEVE RATCHET

FOR SQUARE TAPER SHANK DRILLS ONLY

FIG. 2159

No.	Length of Handle	Socket Will Take Drills	Height of Head, in.	Length of Feed, in.	Weight	Price
1	10	No. 1 Standard	5 $\frac{1}{8}$	1 $\frac{3}{4}$	3 lb. 8 oz.	\$5.00
2	14	Square Taper	7 $\frac{1}{8}$	2 $\frac{3}{4}$	6 lb. 10 oz.	5.75
3	16	$\frac{5}{8}$ x $\frac{3}{8}$ x 1 $\frac{1}{2}$	7 $\frac{1}{8}$	2 $\frac{3}{4}$	7 lb. 6 oz.	6.50
4	18		9 $\frac{1}{2}$	2 $\frac{3}{4}$	12 lb. 8 oz.	7.25
5	22	No. 2 Standard	9 $\frac{1}{2}$	2 $\frac{3}{4}$	13 lb. 0 oz.	7.50
6	24	Square Taper	9 $\frac{1}{2}$	2 $\frac{3}{4}$	13 lb. 8 oz.	7.75
7	28	$\frac{3}{4}$ x $\frac{1}{2}$ x 1 $\frac{3}{4}$	9 $\frac{1}{2}$	2 $\frac{3}{4}$	14 lb. 8 oz.	8.25

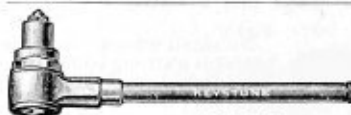
"KEYSTONE" REVERSIBLE MORSE TAPER RATCHET

FOR MORSE TAPER SHANK
DRILLS



FIG. 2160

No.	Length of Handle	Hole in Socket	Size of Drills	Height of Head, in.	Length of Feed, in.	Weight	Price
21	10	No. 2	$\frac{1}{8}$ to $\frac{3}{16}$	6 $\frac{1}{8}$	1 $\frac{3}{4}$	3 lb. 9 oz.	\$5.25
22	14	No. 3	$\frac{1}{8}$ to 1 $\frac{1}{4}$	8 $\frac{1}{8}$	2 $\frac{3}{4}$	6 lb. 8 oz.	6.00
23	16	No. 3 Morse Taper	$\frac{1}{8}$ to 1 $\frac{1}{4}$	8 $\frac{1}{8}$	2 $\frac{3}{4}$	7 lb. 6 oz.	6.75
24	18	No. 4	1 $\frac{1}{8}$ to 2	9 $\frac{1}{2}$	2 $\frac{3}{4}$	12 lb. 0 oz.	7.50
25	22	No. 4	1 $\frac{1}{8}$ to 2	9 $\frac{1}{2}$	2 $\frac{3}{4}$	12 lb. 8 oz.	7.75
26	24	No. 4	1 $\frac{1}{8}$ to 2	9 $\frac{1}{2}$	2 $\frac{3}{4}$	12 lb. 12 oz.	8.00
27	28	No. 4	1 $\frac{1}{8}$ to 2	9 $\frac{1}{2}$	2 $\frac{3}{4}$	13 lb. 8 oz.	8.50



"KEYSTONE" REVERSIBLE BOILER RATCHET

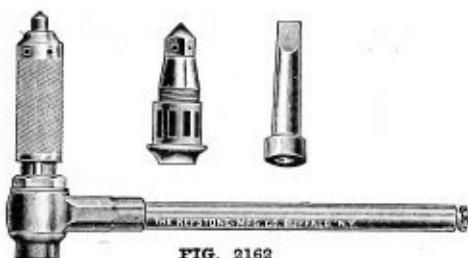
FOR SQUARE SHANK DRILLS ONLY

FIG. 2161

No.	Length of Handle	Socket Will Take Drills	Height of Head, in.	Length of Feed, in.	Weight	Price
31	10	No. 1 Standard	3 $\frac{1}{8}$	1 $\frac{1}{2}$	2 lb. 14 oz.	\$5.00
32	14	Square Taper	4 $\frac{1}{2}$	1 $\frac{1}{2}$	5 lb. 2 oz.	5.75
33	16	$\frac{5}{8}$ x $\frac{3}{8}$ x 1 $\frac{1}{2}$	4 $\frac{1}{2}$	1 $\frac{1}{2}$	5 lb. 14 oz.	6.50
34	18		5 $\frac{1}{4}$	2	9 lb. 0 oz.	7.25
35	22	No. 2 Standard	5 $\frac{1}{4}$	2	9 lb. 12 oz.	7.50
36	24	Square Taper	5 $\frac{1}{4}$	2	10 lb. 0 oz.	7.75
37	28	$\frac{3}{4}$ x $\frac{1}{2}$ x 1 $\frac{3}{4}$	5 $\frac{1}{4}$	2	10 lb. 8 oz.	8.25

"KEYSTONE" RE-VERSIBLE RATCHET**COMBINATION NO. 200**

Consists of ratchet for taper shank twist drills, sleeve for square shank drills, and short boiler socket for square shank drills. (Sockets interchangeable.)

**FIG. 2162**

No.	Length of Handle	Sockets Will Take	Drills	Weight	Price Complete
51	10 in.	No. 2 Morse Taper—No. 1 Square		4 lb. 14 oz.	\$ 7.75
52	14 in.	No. 3 Morse Taper—No. 1 Square		9 lb. 0 oz.	9.00
53	16 in.	No. 3 Morse Taper—No. 1 Square		10 lb. 2 oz.	10.00
54	18 in.	No. 4 Morse Taper—No. 2 Square		16 lb. 8 oz.	11.25
55	22 in.	No. 4 Morse Taper—No. 2 Square		17 lb. 0 oz.	11.50
56	24 in.	No. 4 Morse Taper—No. 2 Square		17 lb. 8 oz.	11.75
57	28 in.	No. 4 Morse Taper—No. 2 Square		18 lb. 0 oz.	12.25

**FIG. 2163****"KEYSTONE" RE-VERSIBLE RATCHET****COMBINATION NO. 100**

(Interchangeable)

Square sleeve ratchet and short boiler socket.

No.	Length of Handle	Sockets Will Take	Drills	Weight	Price
41	10 in.	No. 1 Square Shank Drill		4 lb. 7 oz.	\$6.50
42	14 in.	No. 1 Square Shank Drill		8 lb. 2 oz.	7.50
43	16 in.	No. 1 Square Shank Drill		9 lb. 8 oz.	8.50
44	18 in.	No. 2 Square Shank Drill		15 lb. 8 oz.	9.50
45	22 in.	No. 2 Square Shank Drill		16 lb. 4 oz.	9.75
46	24 in.	No. 2 Square Shank Drill		16 lb. 8 oz.	10.00
47	28 in.	No. 2 Square Shank Drill		17 lb. 4 oz.	10.50

"KEYSTONE" RE-VERSIBLE RATCHET**COMBINATION NO. 300**

Four complete ratchets in one; has long and short feed for any style of Morse taper or square taper shank drills. (All parts interchangeable.)

**FIG. 2164**

No.	Length of Handle	Sockets Will Take	Drills	Weight	Price Complete
50M	8 1/2 in.	No. 1 Morse or Bit Stock Drills		2 lb. 6 oz.	\$ 7.00
51M	10 in.	No. 2 Morse or No. 1 Sq. Shank		4 lb. 13 oz.	7.75
52M	14 in.	No. 3 Morse or No. 1 Sq. Shank		8 lb. 8 oz.	9.00
53M	16 in.	No. 3 Morse or No. 1 Sq. Shank		9 lb. 8 oz.	10.00

"KEYSTONE" SMALL REVERSIBLE RATCHET

Morse Taper No. 300A

**FIG. 2165**

Boiler "Morse Taper" No. 300B

**FIG. 2166**

No. 300A—"Long Feed" for Morse Taper Drills only. No. 1 Taper Socket, taking Drills from $\frac{1}{8}$ to $\frac{1}{2}$ of an inch. Height of head, $5\frac{1}{4}$ inches. Length of handle, $8\frac{1}{2}$ inches.

Price\$5.00

No. 300B—"Short Feed" for Morse Taper Drills only. No. 1 Taper Socket, taking Drills from $\frac{1}{8}$ to $\frac{1}{2}$ of an inch. Height of head, $3\frac{1}{8}$ inches. Length of handle, $8\frac{1}{2}$ inches.

Price\$4.75

"Square Sleeve" No. 300C

**FIG. 2167**

"Boiler" No. 300D

**FIG. 2168**

No. 300C—"Long Feed" for Bit Stock Taper Drills and Reamers. Height of head, $4\frac{3}{8}$ inches. Length of handle, $8\frac{1}{2}$ inches.

Price\$4.75

No. 300D—"Short Feed" for Bit Stock Taper Drills and Reamers. Height of head, $3\frac{1}{8}$ inches. Length of handle, $8\frac{1}{2}$ inches.

Price\$4.50

"KEYSTONE" REVERSIBLE COMBINATION NO. 400**FIG. 2169**

No. 1 Taking Bit Stock Drills, also No. 1 Morse Taper Drills. No. 3 Taking No. 1 Square Shank Drills, also No. 3 Morse Taper Drills from $\frac{1}{8}$ to $1\frac{1}{4}$ inches.

No. 1 Ratchet complete, with two Collets.....\$ 8.00

No. 1 Ratchet with one Collet 7.00

No. 1 Square or Taper Colleteach 1.20

No. 3 Ratchet complete, with four Collets..... 11.00

No. 3 Ratchet with Square or Taper Collet..... 8.25

No. 3 Square or Paper Colleteach 1.25

No. 3 Reducing Collets or Sleeves.....each .75

This Ratchet is made to conform with the latest specifications of the U. S. Navy.

**"MONARCH"
SQUARE SLEEVE
RATCHET
SINGLE ACTING**

**FOR SQUARE SHANK
DRILLS ONLY**



FIG. 2170

No.	Length of Handle	Socket Will Take Drills	Height of Head	Length of Feed	Weight	Price
10	10 in.	No. 1 Standard. Square Taper..... $\frac{5}{8} \times \frac{3}{8} \times 1\frac{1}{2}$	$5\frac{5}{8}$ in.	$1\frac{3}{4}$ in.	3 lb. 10 oz.	\$5.00
20	12 "		$7\frac{5}{8}$ "	$2\frac{3}{4}$ "	6 " 12 "	5.50
30	15 "		$7\frac{5}{8}$ "	$2\frac{3}{4}$ "	7 " 12 "	6.00
40	18 "	No. 2 Standard. Square Taper..... $\frac{3}{4} \times 1\frac{1}{2} \times 1\frac{3}{4}$	$9\frac{1}{2}$ "	$2\frac{3}{4}$ "	13 " 0 "	7.50
50	22 "		$9\frac{1}{2}$ "	$2\frac{3}{4}$ "	13 " 8 "	8.50
60	24 "		$9\frac{1}{2}$ "	$2\frac{3}{4}$ "	14 " 8 "	9.00
70	28 "		$9\frac{1}{2}$ "	$2\frac{3}{4}$ "	15 " 8 "	10.00



**"MONARCH" MORSE TAPER RATCHET
SINGLE ACTING**

FIG. 2171

No.	Length of Handle	Hole in Socket	Size of Drills	Height of Head	Length of Feed	Weight	Price
110	10 in.	No. 2	$\frac{3}{16}$ to $\frac{23}{32}$	$6\frac{1}{8}$ in.	$1\frac{3}{4}$ in.	3 lb. 12 oz.	\$5.25
120	12 "	" 3	$\frac{23}{32}$ " $1\frac{1}{4}$	$8\frac{3}{8}$ "	$2\frac{3}{4}$ "	6 " 12 "	5.75
130	15 "	" 3 Morse Taper	$\frac{23}{32}$ " $1\frac{1}{4}$	$8\frac{3}{8}$ "	$2\frac{3}{4}$ "	7 " 12 "	6.25
140	18 "	" 4	$1\frac{1}{8}$ " 2	$9\frac{1}{2}$ "	$2\frac{3}{4}$ "	12 " 0 "	7.75
150	22 "	" 4	$1\frac{1}{8}$ " 2	$9\frac{1}{2}$ "	$2\frac{3}{4}$ "	13 " 3 "	8.75
160	24 "	" 4	$1\frac{1}{8}$ " 2	$9\frac{1}{2}$ "	$2\frac{3}{4}$ "	13 " 8 "	9.25
170	28 "	" 4	$1\frac{1}{8}$ " 2	$9\frac{1}{2}$ "	$2\frac{3}{4}$ "	14 " 8 "	10.25

**"MONARCH"
BOILER RATCHET
SINGLE ACTING**

**FOR SQUARE SHANK
DRILLS ONLY**



FIG. 2172

No.	Length of Handle	Socket Will Take Drills	Height of Head	Length of Feed	Weight	Price
210	10 in.	No. 1 Standard. Square Taper..... $\frac{5}{8} \times \frac{3}{8} \times 1\frac{1}{2}$	$2\frac{3}{8}$ in.	$1\frac{1}{4}$ in.	3 lb. 0 oz.	\$4.25
220	12 "		$4\frac{1}{4}$ "	$1\frac{1}{2}$ "	5 " 0 "	4.75
230	15 "		$4\frac{1}{4}$ "	$1\frac{1}{2}$ "	6 " 4 "	5.50
240	18 "	No. 2 Standard. Square Taper..... $\frac{3}{4} \times 1\frac{1}{2} \times 1\frac{3}{4}$	$5\frac{3}{8}$ "	2 "	9 " 8 "	7.50
250	22 "		$5\frac{3}{8}$ "	2 "	10 " 8 "	8.50
260	24 "		$5\frac{3}{8}$ "	2 "	11 " 0 "	9.00
270	28 "		$5\frac{3}{8}$ "	2 "	12 " 8 "	10.00

**"KEystone" WESTON RATCHET
FOR SQUARE SHANK DRILLS ONLY**

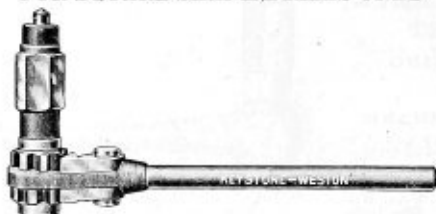


FIG. 2173

STYLE "A"—REGULAR				
Length of Handle	12 in.	14 in.	16 in.	18 in.
Price	\$7.60	8.00	8.75	9.75

STYLE "B"—BOILER MAKER'S				
Length of Handle	12 in.	14 in.		
Price	\$7.60	8.00		

We use No. 1 Standard Square Taper $\frac{3}{8}$ x $\frac{3}{8}$ x $1\frac{1}{2}$ inches long on 12 inch and 14 inch Ratchets, and No. 2 Standard Square Taper $\frac{3}{8}$ x $\frac{1}{2}$ x $1\frac{3}{4}$ inches long on 16 inch and 18 inch.

**"GIANT" RAILROAD TRACK RATCHET
SINGLE ACTING**

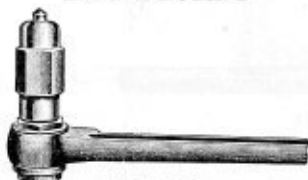


FIG. 2174

Made with 24-inch handle only, taking No. 2 Square Taper Shank Drills.

This tool is made with Web Handle of drop-forged steel; extra heavy Pawl of tool steel; Socket drifted from solid steel; Hexagon Feed Nut, with all-tool-steel Feed Screw, Acme thread.

This Ratchet is made to meet the demand for an extra strong, powerful, all-around tool.

FOR NO. 2 SQUARE SHANK DRILLS ONLY

No. 324A—24-inch handle	\$9.00
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"GIANT" RATCHET SOCKET WRENCH



FIG. 2175

ALL SOCKETS TAKE BOTH SQUARE AND HEXAGON NUTS

Bolt Size

Made with 24-inch handles only, and for the following size nuts: $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, $1\frac{1}{8}$, and $1\frac{1}{4}$ -inch Standard Bolt sizes.

No. 324—24-inch handle, including any one size Socket	\$8.00
Additional Sockets	each 3.50

"KEYSTONE" RATCHET SOCKET REVERSIBLE WRENCH

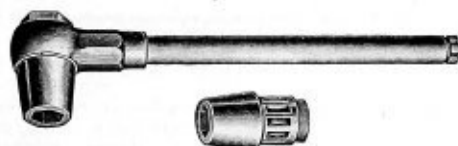


FIG. 2176

The body of this Wrench is made of drop-forged steel, the Socket of forged steel; the handle is made of cold-drawn tubing, thereby insuring the greatest possible strength. These Wrenches are made with handles from 10 inches long and upwards as ordered, other parts being in proportion, and for use on either square or hexagon nuts.

In making Sockets we work according to U. S. standard size nuts. Special Sockets made to order. In ordering Sockets other than U. S. standard size, it is advisable to have sample of nuts to insure accuracy.

Order by bolt sizes and state whether for square or hexagon nuts.

Fig. No.		
No. 171	Wrench, 10-inch handle, with one Socket.....	\$4.75
	Additional Sockets	each 1.75
No. 172	Wrench, 14-inch handle, with one Socket.....	5.50
	Additional Sockets	each 2.00
No. 173	Wrench, 16-inch handle, with one Socket.....	6.50
	Additional Sockets	each 2.50
No. 174	Wrench, 18-inch handle, with one Socket.....	7.50
	Additional Sockets	each 3.00
No. 175	Wrench, 22-inch handle, with one Socket.....	7.75
	Additional Sockets	each 3.00
No. 176	Wrench, 24-inch handle, with one Socket.....	8.00
	Additional Sockets	each 3.00
No. 177	Wrench, 28-inch handle, with one Socket.....	8.50
	Additional Sockets	each 3.00

See below for list of bolts and nuts for which the above Sockets are made.

The following sizes are regular and standard.

Special quotations on sizes other than this list.

10-inch Socket Wrench is suitable for Nuts.	
$\frac{1}{4}$ $\frac{5}{16}$ $\frac{3}{8}$ $\frac{7}{16}$ $\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$	Bolt Size
14-inch Socket Wrench is suitable for Nuts	
$\frac{3}{8}$ $\frac{7}{16}$ $\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{7}{8}$	Bolt Size
16-inch Socket Wrench is suitable for Nuts	
$\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{7}{8}$ 1 $1\frac{1}{8}$	Bolt Size
18 to 28-inch Socket Wrench is suitable for Nuts	
$\frac{3}{4}$ $\frac{7}{8}$ 1 $1\frac{1}{8}$ $1\frac{1}{4}$ $1\frac{3}{8}$ $1\frac{1}{2}$	Bolt Size

U. S. STANDARD BOLTS AND NUTS

Bolt	Square Nut	Hexagon Nut	Bolt	Square Nut	Hexagon Nut
$\frac{1}{4}$ -in.	$\frac{1}{2}$ -in.	$\frac{1}{2}$ -in.	$\frac{3}{4}$ -in.	$1\frac{1}{4}$ -in.	$1\frac{1}{4}$ -in.
$\frac{5}{16}$ "	$\frac{11}{16}$ "	$\frac{11}{16}$ "	$\frac{7}{8}$ "	$1\frac{3}{8}$ "	$1\frac{3}{8}$ "
$\frac{3}{8}$ "	$\frac{13}{16}$ "	$\frac{13}{16}$ "	1 "	$1\frac{1}{2}$ "	$1\frac{1}{2}$ "
$\frac{7}{16}$ "	$\frac{3}{4}$ "	$\frac{3}{4}$ "	$1\frac{1}{8}$ "	$1\frac{3}{4}$ "	$1\frac{3}{4}$ "
$\frac{1}{2}$ "	$\frac{7}{8}$ "	$\frac{7}{8}$ "	$1\frac{1}{4}$ "	2 "	2 "
$\frac{9}{16}$ "	$\frac{15}{16}$ "	$\frac{15}{16}$ "	$1\frac{3}{8}$ "	$2\frac{1}{8}$ "	$2\frac{1}{8}$ "
$\frac{5}{8}$ "	$1\frac{1}{16}$ "	$1\frac{1}{16}$ "	$1\frac{1}{2}$ "	$2\frac{3}{8}$ "	$2\frac{3}{8}$ "

"KEYSTONE" REVERSIBLE RATCHET TAP WRENCH**FIG 2177**

This tool will prove a very valuable addition for all first-class machine shops, builders of machinery, boiler shops for use on stay bolts, flue expanders, etc., also for plumbers, steam fitters, gas and waterworks tapping machines. The above tool is a very high-grade article, all sockets being drifted from solid steel, and is superior to the ordinary malleable wrench on the market.

No. 61	Tap Wrench, 10-inch handle, $\frac{5}{8}$ -inch square hole in Socket.....	\$4.25
	Extra Sockets	1.25
No. 61A	Tap Wrench, 14-inch handle, $\frac{3}{4}$ -inch square hole in Socket.....	5.00
	Extra Sockets	1.50
No. 62	Tap Wrench, 14-inch handle, $\frac{7}{8}$ -inch square hole in Socket.....	5.00
	Extra Sockets	1.50
No. 63	Tap Wrench, 16-inch handle, 1-inch square hole in Socket.....	5.75
	Extra Sockets	1.75
No. 64	Tap Wrench, 18-inch handle, $1\frac{1}{8}$ -inch square hole in Socket.....	6.50
	Extra Sockets	2.00
No. 65	Tap Wrench, 22-inch handle, $1\frac{1}{2}$ -inch square hole in Socket.....	6.75
	Extra Sockets	2.00
No. 66	Tap Wrench, 24-inch handle, $1\frac{3}{4}$ -inch square hole in Socket.....	7.00
	Extra Sockets	2.00
No. 67	Tap Wrench, 28-inch handle, $1\frac{3}{4}$ -inch square hole in Socket.....	7.50
	Extra Sockets	2.00

"KEYSTONE" REVERSIBLE RATCHET STUD DRIVER**FIG 2178**

The "Keystone Stud Driver" is the only tool of its nature on the market, and is used by the largest builders of machinery in the country. It is conceded a valuable time-saver over old

methods of putting in Studs in all classes of machinery where Studs are used; will pay for itself many times over in a short space of time. It is endorsed wherever used. Studs can be driven quickly and released instantly. Threads are never damaged by this method and are all driven to uniform depth.

No. 161	Stud Driver, complete, with one Stud Nut, 10-inch handle.....	\$ 5.75
No. 162	Stud Driver, complete, with one Stud Nut, 14-inch handle.....	6.75
No. 163	Stud Driver, complete, with one Stud Nut, 16-inch handle.....	7.75
No. 164	Stud Driver, complete, with one Stud Nut, 18-inch handle.....	9.00
No. 165	Stud Driver, complete, with one Stud Nut, 22-inch handle.....	9.25
No. 166	Stud Driver, complete, with one Stud Nut, 24-inch handle.....	9.50
No. 167	Stud Driver, complete, with one Stud Nut, 28-inch handle.....	10.00

SEPARATE PARTS

Nos.	161	162	163	164	165	166	167
Stud Socket	\$1.25	1.50	1.75	2.00	2.00	2.00	2.00
Stud Nut	1.50	1.75	2.00	2.50	2.50	2.50	2.50

Note.—In ordering, state size of Studs for which Nuts are required.

10-inch Stud Driver, suitable for Studs $\frac{1}{4}$ in. up to and including $\frac{5}{8}$ inch	
14-inch Stud Driver, suitable for Studs $\frac{3}{8}$ in. up to and including $\frac{7}{8}$ inch	
16-inch Stud Driver, suitable for Studs $\frac{1}{2}$ in. up to and including $1\frac{1}{8}$ inches	
18-inch Stud Driver, suitable for Studs $\frac{3}{4}$ in. up to and including $1\frac{1}{4}$ inches	
22-inch Stud Driver, suitable for Studs $1\frac{1}{2}$ in. up to and including $1\frac{3}{4}$ inches	
24 to 28-inch Stud Driver, suitable for Studs $1\frac{3}{4}$ inch up to and including $1\frac{3}{4}$ inches	

THE "FAVORITE" REVERSIBLE RATCHET WRENCH

Wrench heads are interchangeable in each handle, as shown below. A, B, and C heads fit No. 1 handle, etc.

The various wrench heads fit nuts (bolt size) as shown in table



FIG. 2179

opposite. The exact sizes of openings in wrench head are shown in center column.

PRICE LIST OF WRENCHES

Wrench No.	Length of Handle	Take Heads	Head sent unless otherwise Specified	Price, Handle and one Head
1	15 Ins.	ABC	A	\$4.50
2	23 "	DEFGM	E	5.50
2½	28 "	Z	Z	6.50
3	28 "	HKL	H	7.50

HEAD	To Fit U.S. Std Nuts (Bolt Sizes) in Inches		Exact Sizes of Openings in Head		FIT HANDLES	PRICE
	Sq.	Hex.	Sq.	Hex.		
A	1 1/2	1 1/2	1 5/16	1 5/16	No. 1	\$2.50
B	5/8	5/8	1 1/8	1 1/8	No. 1	2.50
C	—	5/8 x 3/4	1 1/8 x 1 5/16	1 5/16	No. 1	2.50
D	—	3/4 x 7/8	1 5/16 x 1 1/2	1 1/2	No. 2	3.00
E	3/4	3/4	1 5/16	1 5/16	No. 2	3.00
F	7/8	7/8	1 1/2	1 1/2	No. 2	3.00
G	—	7/8 x 1	1 1/2 x 1 11/16	1 11/16	No. 2	3.00
M	—	1 x 1 1/8	1 11/16 x 1 7/8	1 7/8	No. 2	3.00
Z	—	1 1/8 x 1 3/4	1 7/8 x 2 1/16	2 1/16	No. 2 1/2	3.00
H	1	1	1 11/16	1 11/16	No. 3	4.00
K	1 1/8	1 1/8	1 7/8	1 7/8	No. 3	4.00
L	1 3/4	1 3/4	2 1/16	2 1/16	No. 3	4.00

NO. O WRENCH AND ATTACHMENTS

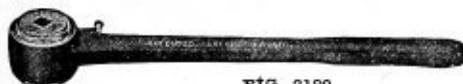


FIG. 2180

One 15 in. Handle and one Head with openings for 1/4-in. and 3/8-in. square Standard Nuts.....

Japaned

Nickel Plated

\$4.00

\$6.00



FIG. 2181

One set of Sockets to fit Head, consisting of one 8-in. Extension Socket, ten Sockets to fit Standard Nuts (1 each) square and hexagon, 3/8, 1/2, 5/8, 3/4 in.....

3.00

4.00

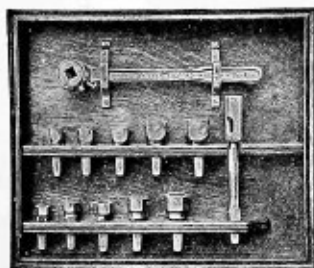


FIG. 2182

No. O Set. Complete without Drill Head, on strong, well-made Oak Wrench Board ready to hang in engine-room

14.00

17.00

STEEL SOCKET REVERSIBLE RATCHET BRIDGE WRENCH

The range of nuts that can be handled by these wrenches is from $\frac{5}{16}$ to $3\frac{1}{4}$ inches bolt diameter, or $1\frac{1}{8}$ to 5 inches smaller outside diameter of the nut. They will turn nuts on or off without removing the wrench, and soon make good their cost by saving labor.

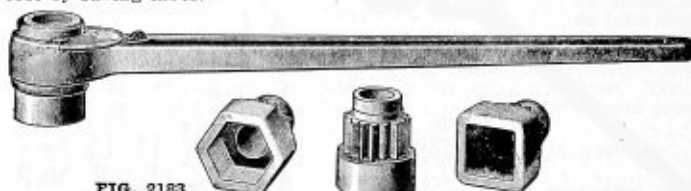


FIG. 2183

No.	Length of Handle	Approx. Weight	Size of Opening, Inches		Price With One Gear Each	Price Extra Gear Each
			Square	Hexagon		
1	2 ft.	10 lbs.	1, $1\frac{1}{16}$, $1\frac{1}{4}$, $1\frac{1}{8}$, $1\frac{1}{2}$, $1\frac{3}{4}$, 2	1, $1\frac{1}{16}$, $1\frac{1}{4}$, $1\frac{1}{8}$, $1\frac{1}{2}$, $1\frac{3}{4}$, 2	\$ 6.00	\$1.00
$1\frac{1}{2}$	3 ft.	12 lbs.	List of Sockets, same sizes as in No. 1		7.00	1.00
2	3 ft.	23 lbs.	2, $2\frac{1}{16}$, $2\frac{1}{4}$, $2\frac{1}{8}$, $2\frac{1}{2}$, $2\frac{3}{4}$, $3\frac{1}{4}$	2, $2\frac{1}{16}$, $2\frac{1}{4}$, $2\frac{1}{8}$, $2\frac{1}{2}$, $2\frac{3}{4}$, $3\frac{1}{4}$	14.00	2.50
$2\frac{1}{2}$	4 ft.	26 lbs.	List of Sockets, same sizes as in No. 2		15.00	2.50
3	3 ft.	50 lbs.	$3\frac{1}{8}$, $3\frac{1}{2}$, $3\frac{3}{4}$, $4\frac{1}{4}$, $4\frac{1}{2}$, 5	$3\frac{1}{8}$, $3\frac{1}{2}$, $3\frac{3}{4}$, $4\frac{1}{4}$, $4\frac{1}{2}$, 5	20.00	4.50
$3\frac{1}{2}$	4 ft.	54 lbs.	List of Sockets, same sizes as in No. 3		21.00	4.50

"MULTO" SOCKET RATCHET WRENCH

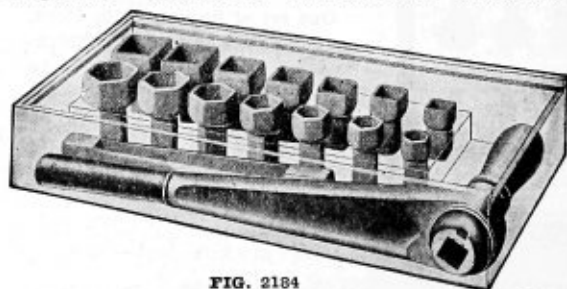


FIG. 2184

This wrench will reverse and work right or left handed at pleasure. The sockets fit nuts square or hexagon.

$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{9}{16}$, $\frac{5}{8}$ inches (bolt diameter),

$\frac{1}{2}$, $\frac{3}{4}$, $1\frac{1}{8}$, $1\frac{1}{4}$, $\frac{3}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$ inches (the smaller outside diameter of the nut).

Each wrench with complete set of sockets is packed in a substantial covered box. No box is furnished with broken sets.

Price on Wrench complete with fourteen sockets.....	\$6.00
Price on Wrench only	3.25
Price on Extra Sockets, each	.30
Price on Extension Bar	.75

LAG-SCREW REVERSIBLE RATCHET WRENCHES

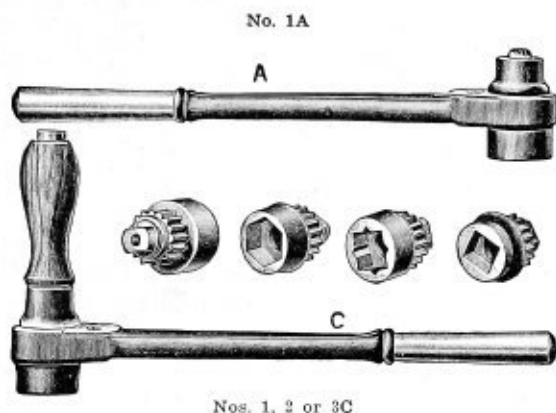


FIG. 2185

No.	Length of Handle	Style	Size of Opening, Inches		Price With One Socket Ea.	Price Ex. Socket Each
			Square	Hexagon		
1	12 in.	A	$\frac{3}{8}$ taper, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, $\frac{7}{8}$, $\frac{1}{2}$, $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{1}{2}$	$\frac{1}{2}$, $\frac{3}{8}$, $\frac{7}{8}$, $\frac{3}{4}$, $1\frac{1}{8}$, $1\frac{1}{4}$	\$1.75	\$0.40
1	12 in.	C	List of Sockets, same sizes as in Style A		2.00	.40
2	16 in.	A or C	$1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{8}$, $1\frac{1}{2}$, $1\frac{3}{4}$	$1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{8}$, $1\frac{1}{2}$	3.00	.75
3	20 in.	A or C	$1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{8}$, $1\frac{1}{2}$, $1\frac{3}{4}$, $1\frac{7}{8}$	$1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{8}$, $1\frac{1}{2}$, $1\frac{3}{4}$, $1\frac{7}{8}$	4.50	1.00

Designed for turning coach screws, nuts or bolts, either way, without taking off the wrench.

These wrenches are easily changeable for various sizes by means of the different sockets.

ARMSTRONG UNIVERSAL RATCHET DRILL



Two inches of motion at end of handle, IN ANY DIRECTION, will drive the Drill.

Patented Nov. 8, 1898,
Sept. 23, 1900.

When the other ratchets you have are useless for lack of room to move the handle, get an "ARMSTRONG UNIVERSAL" and it will do the job.

FIG. 2186

This ratchet is designed to operate successfully in difficult situations where obstructions might make the use of the ordinary ratchet impossible, and at the same time provision is made for its operation in the usual way so that it may perform the work of a plain ratchet as well as the special service for which it is particularly adapted.

No.	Length Inches	Drill Socket Taper No.	Length Head Inches	Feed Inches	Taking Drills	Price Each
4-M	14	1 Square	4 $\frac{1}{2}$	1 $\frac{1}{2}$	All No. 1 Square Shank	\$12.00
4-K	14	2 Morse	5 $\frac{1}{2}$	1 $\frac{1}{2}$	$\frac{3}{8}$ to $\frac{1}{2}$ inch	12.00
5-J	16	1 Square	5 $\frac{1}{2}$	1 $\frac{3}{8}$	All No. 1 Square Shank	15.00
5-L	16	2 Square	5 $\frac{1}{2}$	1 $\frac{3}{8}$	All No. 2 Square Shank	15.00
5-O	16	3 Morse	7	1 $\frac{3}{8}$	$\frac{3}{8}$ to 1 $\frac{1}{4}$ inch	15.00
6-F	18	2 Square	5 $\frac{1}{2}$	2 $\frac{1}{4}$	All No. 2 Square Shank	18.00
6-N	18	3 Morse	7 $\frac{1}{2}$	2 $\frac{1}{4}$	$\frac{3}{8}$ to 1 $\frac{1}{4}$ inch	18.00
6-S	18	4 Morse	7 $\frac{1}{2}$	2 $\frac{1}{4}$	1 $\frac{1}{4}$ to 2 inch	18.00

EXTRA SPINDLES

No.	4-M	4-K	5-J	5-L	5-O	6-F	6-N	6-S
Price .....each	\$2.40	2.40	3.00	3.00	3.00	3.60	3.60	3.60

M and K spindles are interchangeable in No. 4 Ratchet, J, L and O in No. 5 Ratchet and F, N and S in No. 6 Ratchet.

NOTE—By means of Sleeves and Sockets Spindles can be made to take smaller sizes of Morse Taper Drills. Drills with Square Taper Shanks and Blacksmith Drills.

DRILLING POSTS (OLD MAN)

Nos. 8, 10 and 12

Nos. C8, C10 and C12



REGULAR STYLE

No.	Height Inches	Arm Radius Inches	Price Each
8	16	8	\$5.00
10	20	10	6.00
12	26	12	7.50

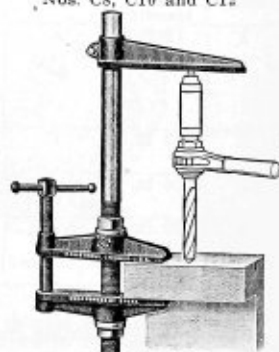


FIG. 2188

CLAMP STYLE

No.	Height of Post Inches	Arm Radius Inches	Capacity Clamp Inches	Price Each
C-8	16	8	4	\$ 7.00
C-10	20	10	4 $\frac{1}{2}$	8.00
C-12	26	12	5	10.00

ENGINEERS' WRENCHES

15° ANGLE—SINGLE HEAD



FIG. 2189

Unfinished are milled only.

Semi-finished are milled case-hardened all over, and have heads ground bright.

Finished are milled, polished all over, case hardened and lacquered, heads bright.

The following semi-finished and finished wrenches have holes in end of handle

Number	17	18	19	19½	20	20½	A21	A21¼	A21½	A22	A22½
Hole	⅞	¾	¾	¾	1	1	1½	1½	1½	1½	1½

Wrenches of this style but with handle tapered will be furnished on orders for the larger sizes, beginning with No. 11. Tapered handle wrenches of smaller sizes and flared handle wrenches of larger sizes can also be furnished if ordered in quantities

Number	For U. S. Standard Nut; Size Bolts	Opening Milled	Extreme Length Approx.	Thickness Head	Price			Number
					Un-finished	Semi-finished	Finished	
00	⅛	⅛	3	⅛	\$0.09	\$0.14	\$0.22	00
0	⅛	⅛	3½	⅛	.10	.15	.25	0
1	¼	⅛	4	¼	.12	.18	.28	1
2	⅜	⅛	4¾	⅜	.15	.22	.32	2
3	½	⅛	5½	½	.18	.26	.38	3
4	⅝	⅛	6½	⅝	.22	.32	.45	4
5	¾	⅛	7½	¾	.26	.38	.54	5
6	⅞	⅛	8¾	⅞	.31	.46	.65	6
7	1	1⅞	9¼	1	.40	.57	.82	7
8	1¼	1¼	11¾	1¼	.55	.75	1.05	8
9	1½	1½	13	1½	.85	1.15	1.52	9
10	1	1¾	14¾	1¾	1.20	1.60	2.10	10
11	1½	1½	16½	1½	1.65	2.10	2.80	11
12	1¾	2	18½	1¾	2.20	2.85	3.70	12
13	1¾	2½	20	1	2.80	3.65	4.70	13
14	1½	2½	22	1½	3.45	4.60	5.80	14
15	1¾	2½	24	1¾	4.15	5.60	7.10	15
16	1¾	2¾	25½	1¾	4.90	6.70	8.50	16
16A	1¾	2½	27	1¾	4.90	6.70	8.50	16A
17	2	3½	29½	1¾	7.50	10.25	13.00	17
18	2¼	3½	33	1½	11.50	14.75	18.00	18
19	2½	3½	37	1¾	17.00	21.00	25.00	19
19A	2¾	4¼	39	1¾	17.00	21.00	25.00	19A
20	3	4½	41	1¾	25.00	31.00	37.00	20
20A	3¼	5	43	1¾	25.00	31.00	37.00	20A
21A	3½	5½	45	2½	40.00	52.00	64.00	21A
21B	3¾	5¾	47	2½	40.00	52.00	64.00	21B
21C	4	6½	49	2½	40.00	52.00	64.00	21C
22A	4½	6¾	51	3	80.00	102.00	124.00	22A
22B	5	7½	53	3	80.00	102.00	124.00	22B

ENGINEERS' WRENCHES



FIG. 2190

15° ANGLE
DOUBLE HEAD

Unfinished are milled only.
Semi-finished are milled, edges
ground and case-hardened all
over.

Finished are milled, polished all
over, case-hardened and lacquered.

Num- ber	For U. S. Standard Nuts; Size Bolts	Openings Milled	Extreme Length Approx.	Thickness Heads	Price			Num- ber
					Un- finished	Semi- finished	Finished	
21	$\frac{1}{8}$ & $\frac{1}{8}$	$\frac{1}{8}$ & $\frac{1}{8}$	$3\frac{1}{2}$	$\frac{1}{8}$	\$0.12	\$0.17	\$0.26	21
22	$\frac{1}{8}$ & $\frac{1}{4}$	$\frac{1}{8}$ & $\frac{1}{4}$	4	$\frac{1}{4}$	.14	.21	.32	22
23	$\frac{1}{8}$ & $\frac{1}{2}$	$\frac{1}{8}$ & $\frac{1}{2}$	4	$\frac{1}{4}$	.14	.21	.32	23
24	$\frac{1}{8}$ & $\frac{3}{8}$	$\frac{1}{8}$ & $\frac{3}{8}$	$4\frac{1}{8}$	$\frac{3}{8}$	.17	.25	.38	24
25	$\frac{1}{4}$ & $\frac{1}{8}$	$\frac{1}{4}$ & $\frac{1}{8}$	$4\frac{1}{8}$	$\frac{3}{8}$	.17	.25	.38	25
26	$\frac{1}{4}$ & $\frac{1}{4}$	$\frac{1}{4}$ & $\frac{1}{4}$	$5\frac{1}{8}$	$\frac{1}{2}$	.21	.31	.46	26
27	$\frac{1}{4}$ & $\frac{3}{8}$	$\frac{1}{4}$ & $\frac{3}{8}$	$5\frac{1}{8}$	$\frac{1}{2}$	.21	.31	.46	27
28	$\frac{1}{4}$ & $\frac{1}{2}$	$\frac{1}{4}$ & $\frac{1}{2}$	$6\frac{1}{8}$	$\frac{3}{4}$	.25	.37	.56	28
29	$\frac{3}{8}$ & $\frac{1}{8}$	$\frac{1}{4}$ & $\frac{3}{8}$	$6\frac{1}{8}$	$\frac{1}{2}$	.25	.37	.56	29
30	$\frac{3}{8}$ & $\frac{1}{4}$	$\frac{1}{4}$ & $\frac{3}{8}$	$7\frac{1}{4}$	$\frac{3}{4}$	.30	.45	.68	30
31	$\frac{3}{8}$ & $\frac{1}{2}$	$\frac{1}{4}$ & $\frac{3}{8}$	$7\frac{1}{4}$	$\frac{3}{4}$	.30	.45	.68	31
32	$\frac{1}{2}$ & $\frac{1}{8}$	$\frac{1}{4}$ & $\frac{3}{8}$	$8\frac{1}{4}$	$\frac{1}{2}$	.37	.55	.85	32
33	$\frac{1}{2}$ & $\frac{1}{4}$	$\frac{1}{4}$ & $\frac{3}{8}$	$8\frac{1}{4}$	$\frac{1}{2}$	.37	.55	.85	33
34	$\frac{1}{2}$ & $\frac{3}{8}$	$\frac{1}{4}$ & $\frac{3}{8}$	$9\frac{1}{4}$	$\frac{1}{2}$	.46	.68	1.08	34
35	$\frac{1}{2}$ & $\frac{1}{2}$	$\frac{1}{4}$ & $\frac{3}{8}$	$9\frac{1}{4}$	$\frac{1}{2}$	.46	.68	1.08	35
36	$\frac{1}{2}$ & $\frac{3}{4}$	$\frac{1}{4}$ & $\frac{3}{8}$	$11\frac{1}{2}$	$\frac{1}{2}$	.66	.96	1.40	36
37	$\frac{5}{8}$ & $\frac{1}{8}$	$\frac{1}{4}$ & $\frac{3}{8}$	$11\frac{1}{2}$	$\frac{1}{2}$	.66	.96	1.40	37
38	$\frac{5}{8}$ & $\frac{1}{4}$	$\frac{1}{4}$ & $\frac{3}{8}$	$13\frac{1}{2}$	$\frac{3}{4}$	1.00	1.40	1.90	38
39	$\frac{5}{8}$ & $\frac{3}{8}$	$\frac{1}{4}$ & $\frac{3}{8}$	$13\frac{1}{2}$	$\frac{3}{4}$	1.00	1.40	1.90	39
40	$\frac{5}{8}$ & $\frac{1}{2}$	$\frac{1}{4}$ & $\frac{3}{8}$	$15\frac{1}{2}$	$\frac{3}{4}$	1.40	1.90	2.60	40
41	$\frac{7}{8}$ & $\frac{1}{8}$	$\frac{1}{4}$ & $\frac{3}{8}$	$15\frac{1}{2}$	$\frac{3}{4}$	1.40	1.90	2.60	41
42	$\frac{7}{8}$ & $\frac{1}{4}$	$\frac{1}{4}$ & $\frac{3}{8}$	17	$\frac{3}{4}$	1.90	2.65	3.50	42
43	1 & $\frac{1}{8}$	$\frac{1}{4}$ & $\frac{3}{8}$	17	$\frac{3}{4}$	1.90	2.65	3.50	43
44	1 & $\frac{1}{4}$	$\frac{1}{4}$ & $\frac{3}{8}$	19	$\frac{3}{4}$	2.60	3.60	4.70	44
45	$1\frac{1}{8}$ & $\frac{1}{8}$	$\frac{1}{4}$ & $\frac{3}{8}$	19	$\frac{3}{4}$	2.60	3.60	4.70	45
46	$1\frac{1}{8}$ & $\frac{1}{4}$	$\frac{1}{4}$ & $\frac{3}{8}$	21	1	3.80	5.25	6.70	46
47	$1\frac{1}{8}$ & $\frac{3}{8}$	$\frac{1}{4}$ & $\frac{3}{8}$	21	1	3.80	5.25	6.70	47
48	$1\frac{1}{8}$ & $\frac{1}{2}$	$\frac{1}{4}$ & $\frac{3}{8}$	23	$1\frac{1}{8}$	5.20	7.00	8.80	48
49	$1\frac{1}{8}$ & $\frac{3}{4}$	$\frac{1}{4}$ & $\frac{3}{8}$	23	$1\frac{1}{8}$	5.20	7.00	8.80	49
50	$1\frac{1}{8}$ & 1	$\frac{1}{4}$ & $\frac{3}{8}$	25	1 & $1\frac{1}{8}$	6.75	9.00	11.25	50
51	$1\frac{1}{8}$ & $1\frac{1}{8}$	$\frac{1}{4}$ & $\frac{3}{8}$	25	$1\frac{1}{8}$ & $1\frac{1}{8}$	7.40	9.90	12.40	51
52	$1\frac{1}{8}$ & $1\frac{1}{4}$	$\frac{1}{4}$ & $\frac{3}{8}$	27	$1\frac{1}{8}$ & $1\frac{1}{4}$	8.35	11.00	13.65	52
53	$1\frac{1}{8}$ & $1\frac{3}{8}$	$\frac{1}{4}$ & $\frac{3}{8}$	27	$1\frac{1}{8}$ & $1\frac{3}{8}$	9.00	12.00	15.00	53
54	$1\frac{1}{8}$ & 2	$\frac{1}{4}$ & $\frac{3}{8}$	31	$1\frac{1}{8}$ & $1\frac{3}{8}$	11.00	14.25	17.50	54
55	$1\frac{1}{8}$ & $2\frac{1}{8}$	$\frac{1}{4}$ & $\frac{3}{8}$	32	$1\frac{1}{8}$ & $1\frac{3}{8}$	12.00	15.50	19.00	55
56	$1\frac{1}{8}$ & $2\frac{1}{4}$	$\frac{1}{4}$ & $\frac{3}{8}$	34	$1\frac{1}{8}$ & $1\frac{3}{8}$	16.00	20.00	24.00	56
57	2 & $2\frac{1}{4}$	$\frac{1}{4}$ & $\frac{3}{8}$	36	$1\frac{1}{8}$ & $1\frac{3}{8}$	18.50	23.50	28.50	57
57A	2 & $2\frac{1}{2}$	$\frac{1}{4}$ & $\frac{3}{8}$	37	$1\frac{1}{8}$ & $1\frac{3}{8}$	23.00	28.00	33.00	57A
58	$2\frac{1}{4}$ & $2\frac{1}{2}$	$\frac{1}{4}$ & $\frac{3}{8}$	38	$1\frac{1}{8}$ & $1\frac{3}{8}$	26.00	31.00	36.00	58
59	$2\frac{1}{4}$ & $2\frac{3}{4}$	$\frac{1}{4}$ & $\frac{3}{8}$	39	$1\frac{1}{8}$ & $1\frac{3}{8}$	26.00	31.00	36.00	59
60	$2\frac{1}{4}$ & 3	$\frac{1}{4}$ & $\frac{3}{8}$	40	$1\frac{1}{8}$ & $1\frac{3}{8}$	30.00	37.50	45.00	60
61	$2\frac{1}{2}$ & 3	$\frac{1}{4}$ & $\frac{3}{8}$	42	$1\frac{1}{8}$ & $1\frac{3}{8}$	38.00	47.00	56.00	61
62	$2\frac{3}{4}$ & 3	$\frac{1}{4}$ & $\frac{3}{8}$	44	$1\frac{1}{8}$ & $1\frac{3}{8}$	38.00	47.00	56.00	62
63	$2\frac{3}{4}$ & $3\frac{1}{2}$	$\frac{1}{4}$ & $\frac{3}{8}$	46	$1\frac{1}{8}$ & $1\frac{3}{8}$	55.00	67.50	80.00	63
64	3 & $3\frac{1}{2}$	$\frac{1}{4}$ & $\frac{3}{8}$	48	$1\frac{1}{8}$ & $1\frac{3}{8}$	65.00	77.50	90.00	64

"S" WRENCHES WITH CONCAVE HANDLE

22 1-2° ANGLE, DOUBLE HEAD

FOR U. S. STANDARD NUTS

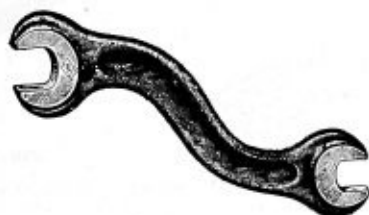


FIG. 2191

Number	Per U. S. Standard Nuts; Size Bolts	Openings Milled	Extreme Length	Thickness Heads	Price			Number
					Un- finished	Semi- finished	Finished	
860A	$\frac{1}{8}$ & $\frac{3}{16}$	$\frac{1}{16}$ & $\frac{3}{16}$	3 $\frac{3}{8}$	$\frac{1}{4}$ & $\frac{3}{16}$	\$0.15	\$0.22	\$0.32	860A
861A	$\frac{1}{8}$ & $\frac{1}{4}$	$\frac{1}{16}$ & $\frac{1}{4}$	4 $\frac{7}{8}$	$\frac{3}{16}$ & $\frac{1}{8}$	.20	.29	.42	861A
861B	$\frac{1}{8}$ & $\frac{1}{4}$	$\frac{3}{16}$ & $\frac{1}{2}$	4 $\frac{7}{8}$	$\frac{3}{16}$ & $\frac{1}{8}$	.20	.29	.42	861B
861C	$\frac{1}{8}$ & $\frac{1}{4}$	$\frac{3}{16}$ & $\frac{3}{8}$	4 $\frac{7}{8}$	$\frac{3}{16}$ & $\frac{1}{8}$	.20	.29	.42	861C
861X	$\frac{1}{4}$ & $\frac{1}{8}$	$\frac{1}{2}$ & $\frac{3}{8}$	4 $\frac{7}{8}$	$\frac{3}{16}$ & $\frac{1}{8}$	.20	.29	.42	861X
862A	$\frac{1}{4}$ & $\frac{3}{8}$	$\frac{1}{2}$ & $\frac{1}{2}$	5 $\frac{3}{4}$	$\frac{1}{8}$ & $\frac{1}{16}$	.22	.32	.50	862A
863A	$\frac{1}{8}$ & $\frac{3}{8}$	$\frac{3}{16}$ & $\frac{1}{2}$	6 $\frac{1}{2}$	$\frac{3}{8}$ & $\frac{1}{16}$	.28	.40	.60	863A
863B	$\frac{1}{8}$ & $\frac{3}{8}$	$\frac{3}{16}$ & $\frac{3}{8}$	6 $\frac{1}{2}$	$\frac{3}{8}$ & $\frac{1}{16}$	.28	.40	.60	863B
864A	$\frac{3}{8}$ & $\frac{1}{8}$	$\frac{1}{2}$ & $\frac{3}{8}$	7 $\frac{1}{4}$	$\frac{3}{16}$ & $\frac{1}{8}$	.37	.53	.75	864A
864B	$\frac{3}{8}$ & $\frac{1}{2}$	$\frac{1}{2}$ & $\frac{7}{8}$	7 $\frac{1}{4}$	$\frac{3}{16}$ & $\frac{1}{8}$	.37	.53	.75	864B
865A	$\frac{1}{2}$ & $\frac{1}{2}$	$\frac{3}{8}$ & $\frac{7}{8}$	8	$\frac{1}{2}$ & $\frac{3}{16}$	.50	.72	1.00	865A
865B	$\frac{1}{2}$ & $\frac{1}{2}$	$\frac{3}{8}$ & $\frac{3}{8}$	8	$\frac{1}{2}$ & $\frac{3}{16}$	.50	.72	1.00	865B
865C	$\frac{1}{2}$ & $\frac{7}{8}$	$\frac{7}{8}$ & $\frac{3}{16}$	8	$\frac{1}{2}$ & $\frac{3}{16}$	.50	.72	1.00	865C
865X	$\frac{1}{2}$ & $\frac{5}{8}$	$\frac{7}{8}$ & $\frac{1}{16}$	8	$\frac{1}{2}$ & $\frac{3}{16}$	.50	.72	1.00	865X
866A	$\frac{1}{2}$ & $\frac{5}{8}$	$\frac{3}{8}$ & $\frac{1}{16}$	10	$\frac{3}{16}$ & $\frac{1}{8}$	.74	1.00	1.35	866A
866B	$\frac{1}{2}$ & $\frac{3}{4}$	$\frac{3}{8}$ & $\frac{1}{4}$	10	$\frac{3}{16}$ & $\frac{1}{8}$	.74	1.00	1.35	866B
866C	$\frac{3}{4}$ & $\frac{3}{4}$	1 $\frac{1}{16}$ & $\frac{1}{4}$	10	$\frac{3}{16}$ & $\frac{1}{8}$	.74	1.00	1.35	866C
867A	$\frac{5}{8}$ & $\frac{7}{8}$	1 $\frac{1}{16}$ & $\frac{1}{16}$	11 $\frac{1}{2}$	$\frac{5}{8}$ & $\frac{1}{16}$	1.10	1.45	1.90	867A
867B	$\frac{3}{4}$ & $\frac{7}{8}$	1 $\frac{1}{4}$ & $\frac{1}{16}$	11 $\frac{1}{2}$	$\frac{5}{8}$ & $\frac{1}{16}$	1.10	1.45	1.90	867B
868A	$\frac{3}{4}$ & 1	1 $\frac{1}{4}$ & $\frac{1}{8}$	14 $\frac{1}{2}$	$\frac{3}{4}$ & $\frac{7}{8}$	1.70	2.30	3.00	868A
868B	$\frac{7}{8}$ & 1	1 $\frac{7}{8}$ & $\frac{1}{8}$	14 $\frac{1}{2}$	$\frac{3}{4}$ & $\frac{7}{8}$	1.70	2.30	3.00	868B
868C	$\frac{7}{8}$ & 1 $\frac{1}{8}$	1 $\frac{7}{8}$ & $\frac{1}{16}$	14 $\frac{1}{2}$	$\frac{3}{4}$ & $\frac{7}{8}$	1.70	2.30	3.00	868C

SET SCREW WRENCHES

22½° ANGLE

Single Head



FIG. 2192

Double Head



FIG. 2193

SINGLE HEAD SET SCREW WRENCHES

Number	For Set Screw Size Inches	Extreme Length Inches	Thickness Head Inches	Price		
				Un- finished	Semi- finished	Finished
500	$\frac{3}{16}$	3	$\frac{3}{16}$	\$0.10	\$0.14	\$0.23
501	$\frac{1}{4}$	3½	$\frac{1}{4}$	.12	.17	.27
502	$\frac{5}{16}$	4¼	$\frac{5}{16}$	.14	.21	.31
503	$\frac{3}{8}$	5	$\frac{3}{8}$	.17	.25	.37
504	$\frac{7}{16}$	5¾	$\frac{7}{16}$	.21	.31	.45
505	$\frac{1}{2}$	6¾	$\frac{1}{2}$	.26	.38	.54
506	$\frac{5}{8}$	7½	$\frac{5}{8}$	.31	.46	.65
507	$\frac{3}{4}$	8½	$\frac{3}{4}$	.38	.55	.80
508	$\frac{7}{8}$	9½	$\frac{7}{8}$	.48	.68	.98
509	1	10½	1	.60	.84	1.20
510	1¼	11½	1¼	.80	1.10	1.48
511	1½	12½	1½	1.10	1.40	1.80

DOUBLE HEAD SET SCREW WRENCHES

523	$\frac{3}{16}$ & $\frac{1}{4}$	3½	$\frac{3}{16}$	\$0.14	\$0.20	\$0.30
524	$\frac{1}{4}$ & $\frac{5}{16}$	4¼	$\frac{1}{4}$	.16	.24	.35
525	$\frac{5}{16}$ & $\frac{3}{8}$	4¾	$\frac{5}{16}$	.16	.24	.35
526	$\frac{3}{8}$ & $\frac{1}{2}$	5	$\frac{3}{8}$	.19	.29	.42
527	$\frac{7}{16}$ & $\frac{5}{8}$	5	$\frac{7}{16}$	.19	.29	.42
528	$\frac{1}{2}$ & $\frac{3}{4}$	5¾	$\frac{1}{2}$	.24	.35	.52
529	$\frac{5}{8}$ & $\frac{3}{4}$	5¾	$\frac{5}{8}$	.24	.35	.52
530	$\frac{3}{4}$ & $\frac{1}{2}$	6¾	$\frac{3}{4}$	.30	.45	.66
531	$\frac{7}{8}$ & $\frac{1}{2}$	6¾	$\frac{7}{8}$	.30	.45	.66
532	$\frac{1}{2}$ & $\frac{3}{8}$	7½	$\frac{1}{2}$	.36	.54	.80
533	$\frac{1}{2}$ & $\frac{1}{4}$	7½	$\frac{1}{2}$	.36	.54	.80
534	$\frac{1}{2}$ & $\frac{5}{8}$	8½	$\frac{1}{2}$	.44	.65	.96
535	$\frac{3}{8}$ & $\frac{5}{8}$	8½	$\frac{3}{8}$	.44	.65	.96
536	$\frac{3}{8}$ & $\frac{3}{4}$	9¼	$\frac{3}{8}$	.56	.80	1.15
537	$\frac{5}{8}$ & $\frac{3}{4}$	9¾	$\frac{5}{8}$	.56	.80	1.15
538	$\frac{5}{8}$ & $\frac{7}{8}$	11	$\frac{5}{8}$	.72	1.00	1.40
539	$\frac{3}{4}$ & $\frac{7}{8}$	11	$\frac{3}{4}$	.72	1.00	1.40
540	$\frac{3}{4}$ & 1	12½	$\frac{3}{4}$	.98	1.30	1.75
541	$\frac{7}{8}$ & 1	12½	$\frac{7}{8}$	.98	1.30	1.75
542	$\frac{7}{8}$ & 1¼	14	$\frac{7}{8}$	1.35	1.75	2.25
543	1 & 1¼	14	1	1.35	1.75	2.25

HEAVY CAP SCREW WRENCHES

15° ANGLE, SINGLE HEAD—FOR HEXAGON HEAD CAP SCREWS



Single Head—FIG. 2194

Double Head—FIG. 2195

SINGLE HEAD, HEAVY CAP SCREW WRENCHES

No.	Old Number	For Hexagon Head Cap Screws; Diameter Screws	Openings Milled	Extreme Length	Thickness Heads	PRICE		
						Un-finished	Semi-finished	Finished
103	1003	$\frac{3}{8}$	$\frac{1}{8}$	5	$\frac{5}{16}$	\$0.17	\$0.25	\$0.37
104	1004	$\frac{1}{2}$	$\frac{5}{8}$	5 $\frac{1}{4}$	$\frac{3}{8}$	.21	.31	.44
105	1005	$\frac{1}{2}$	$\frac{3}{4}$	6 $\frac{1}{2}$	$\frac{1}{2}$	.26	.38	.54
106	1006	$\frac{2}{5}$	$\frac{1}{2}$	7 $\frac{1}{4}$	$\frac{1}{2}$	.32	.46	.66
107	1007	$\frac{5}{8}$	$\frac{3}{4}$	8	$\frac{1}{2}$	.40	.57	.80
108	1008	$\frac{3}{4}$	1	9 $\frac{1}{2}$	$\frac{5}{8}$	.52	.72	1.00
109	1009	$\frac{7}{8}$	1 $\frac{1}{8}$	11	$\frac{3}{4}$	.72	.96	1.30
110	1010	1	1 $\frac{1}{4}$	12 $\frac{1}{2}$	$\frac{7}{8}$	1.00	1.30	1.70
111	1011	1 $\frac{1}{8}$	1 $\frac{3}{8}$	14	$\frac{1}{2}$	1.35	1.70	2.20
112	1012	1 $\frac{1}{4}$	1 $\frac{1}{2}$	15 $\frac{1}{2}$	1 $\frac{1}{2}$	1.70	2.10	2.75
113	1013	1 $\frac{3}{8}$	1 $\frac{5}{8}$	17	1 $\frac{1}{2}$	2.10	2.60	3.40

DOUBLE HEAD HEAVY CAP SCREW WRENCH

No.	Old Number	For Hexagon Head Cap Screws; Diameter Screws	Openings Milled	Extreme Length	Thickness Heads	PRICE		
						Un-finished	Semi-finished	Finished
126	1026	$\frac{1}{4}$ & $\frac{3}{8}$	$\frac{1}{8}$ & $\frac{1}{4}$	5 $\frac{3}{8}$	$\frac{1}{4}$ & $\frac{3}{8}$	\$0.20	\$0.30	\$0.45
127	1027	$\frac{1}{8}$ & $\frac{3}{8}$	$\frac{1}{8}$ & $\frac{1}{4}$	5 $\frac{3}{8}$	$\frac{1}{4}$ & $\frac{3}{8}$	.20	.30	.45
128	1028	$\frac{1}{4}$ & $\frac{1}{2}$	$\frac{1}{4}$ & $\frac{3}{8}$	6 $\frac{1}{8}$	$\frac{1}{4}$ & $\frac{3}{8}$	.25	.37	.54
129	1029	$\frac{3}{8}$ & $\frac{1}{2}$	$\frac{1}{4}$ & $\frac{3}{8}$	6 $\frac{1}{8}$	$\frac{1}{4}$ & $\frac{3}{8}$	.25	.37	.54
130	1030	$\frac{3}{8}$ & $\frac{1}{2}$	$\frac{1}{4}$ & $\frac{3}{8}$	7	$\frac{3}{8}$ & $\frac{1}{2}$	.30	.45	.68
131	1031	$\frac{1}{2}$ & $\frac{1}{2}$	$\frac{5}{8}$ & $\frac{3}{4}$	7	$\frac{3}{8}$ & $\frac{1}{2}$	.30	.45	.68
132	1032	$\frac{1}{2}$ & $\frac{3}{4}$	$\frac{5}{8}$ & $\frac{1}{2}$	7 $\frac{3}{4}$	$\frac{3}{8}$ & $\frac{1}{2}$	.37	.55	.85
133	1033	$\frac{1}{2}$ & $\frac{3}{4}$	$\frac{5}{8}$ & $\frac{1}{2}$	7 $\frac{3}{4}$	$\frac{3}{8}$ & $\frac{1}{2}$	.37	.55	.85
134	1034	$\frac{1}{2}$ & $\frac{5}{8}$	$\frac{3}{4}$ & $\frac{7}{8}$	8 $\frac{5}{8}$	$\frac{1}{2}$ & $\frac{3}{4}$	.46	.68	1.05
135	1035	$\frac{1}{2}$ & $\frac{5}{8}$	$\frac{1}{2}$ & $\frac{7}{8}$	8 $\frac{5}{8}$	$\frac{1}{2}$ & $\frac{3}{4}$	.46	.68	1.05
136	1036	$\frac{1}{2}$ & $\frac{3}{4}$	$\frac{1}{2}$ & 1	10 $\frac{1}{8}$	$\frac{1}{2}$ & $\frac{3}{4}$	.65	.90	1.30
137	1037	$\frac{5}{8}$ & $\frac{3}{4}$	$\frac{3}{4}$ & 1	10 $\frac{1}{8}$	$\frac{1}{2}$ & $\frac{3}{4}$	.65	.90	1.30
138	1038	$\frac{5}{8}$ & $\frac{3}{4}$	$\frac{3}{4}$ & 1 $\frac{1}{8}$	11 $\frac{5}{8}$	$\frac{5}{8}$ & $\frac{3}{4}$	.95	1.25	1.70
139	1039	$\frac{3}{4}$ & $\frac{7}{8}$	1 & 1 $\frac{1}{8}$	11 $\frac{5}{8}$	$\frac{5}{8}$ & $\frac{3}{4}$	.95	1.25	1.70
140	1040	$\frac{3}{4}$ & 1	1 & 1 $\frac{1}{4}$	13 $\frac{1}{4}$	$\frac{3}{4}$ & $\frac{7}{8}$	1.30	1.65	2.20
141	1041	$\frac{7}{8}$ & 1	1 $\frac{1}{8}$ & 1 $\frac{1}{4}$	13 $\frac{1}{4}$	$\frac{3}{4}$ & $\frac{7}{8}$	1.30	1.65	2.20
142	1042	$\frac{7}{8}$ & 1 $\frac{1}{8}$	1 $\frac{1}{8}$ & 1 $\frac{1}{4}$	14 $\frac{3}{4}$	$\frac{7}{8}$ & 1	1.70	2.15	2.80
143	1043	1 & 1 $\frac{1}{8}$	1 $\frac{1}{4}$ & 1 $\frac{1}{4}$	14 $\frac{3}{4}$	$\frac{7}{8}$ & 1	1.70	2.15	2.80
144	1044	1 & 1 $\frac{1}{4}$	1 $\frac{1}{4}$ & 1 $\frac{1}{2}$	16 $\frac{1}{4}$	1 & 1 $\frac{1}{4}$	2.15	2.75	3.50
145	1045	1 $\frac{1}{8}$ & 1 $\frac{1}{4}$	1 $\frac{1}{8}$ & 1 $\frac{1}{2}$	16 $\frac{1}{4}$	1 & 1 $\frac{1}{4}$	2.15	2.75	3.50

STRUCTURAL WRENCHES



FIG. 2196

Number	For U. S. Standard Nut Size Bolt	Opening	Extreme Length	Thickness Heads	Handle Offset	PRICE	
						Un-finished	Semi-finished
901	$\frac{1}{4}$	$1\frac{1}{2}$	8	$\frac{3}{8}$	$1\frac{1}{2}$	\$0.33	\$0.40
902	$\frac{1}{8}$	$\frac{3}{4}$	8	$\frac{3}{8}$	$1\frac{1}{2}$	.33	.40
903	$\frac{3}{8}$	$1\frac{1}{2}$	$9\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	.40	.52
904	$\frac{1}{2}$	$1\frac{1}{2}$	$9\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	.40	.52
905	$\frac{1}{2}$	$1\frac{1}{2}$	11	$\frac{1}{2}$	1	.52	.70
906	$\frac{1}{2}$	1	11	$\frac{1}{2}$	1	.52	.70
907	$\frac{5}{8}$	1 $\frac{7}{64}$	13	$\frac{1}{2}$	1 $\frac{1}{8}$	.74	.98
908	$\frac{5}{8}$	1 $\frac{19}{64}$	15	$\frac{5}{8}$	1 $\frac{1}{4}$	1.02	1.34
909	$\frac{7}{8}$	$1\frac{1}{2}$	17	$\frac{3}{4}$	1 $\frac{3}{8}$	1.40	1.80
910	1	$1\frac{1}{2}$	19	$\frac{3}{4}$	1 $\frac{3}{8}$	1.90	2.50

CAR WRENCHES

22 1-2° ANGLE-DOUBLE HEAD



FIG. 2197

Number	For U. S. Standard Nuts; Size Bolts	Openings	Extreme Length	Thickness Heads	PRICE		Number
					Un-finished	Semi-finished	
367	$\frac{3}{8}$ and $\frac{1}{2}$	$1\frac{1}{2}$ and $1\frac{1}{2}$	12	$\frac{1}{2}$ and $\frac{1}{2}$	\$0.55	\$0.75	367
370	$\frac{1}{2}$ and $\frac{5}{8}$	$1\frac{1}{2}$ and $1\frac{1}{2}$	19	$\frac{1}{2}$ and $\frac{1}{2}$	.95	1.25	370
371	$\frac{1}{2}$ and $\frac{3}{4}$	$1\frac{1}{2}$ and $1\frac{1}{2}$	19	$\frac{1}{2}$ and $\frac{1}{2}$	1.15	1.55	371
373	$\frac{5}{8}$ and $\frac{3}{4}$	$1\frac{1}{2}$ and $1\frac{1}{2}$	20	$\frac{1}{2}$ and $\frac{1}{2}$	1.15	1.55	373
374	$\frac{5}{8}$ and $\frac{7}{8}$	$1\frac{1}{2}$ and $1\frac{1}{2}$	21	$\frac{1}{2}$ and $\frac{1}{2}$	1.35	1.85	374
376	$\frac{3}{4}$ and $\frac{7}{8}$	$1\frac{1}{2}$ and $1\frac{1}{2}$	21	$\frac{1}{2}$ and $\frac{1}{2}$	1.35	1.85	376
377	$\frac{3}{4}$ and 1	$1\frac{1}{2}$ and $1\frac{1}{2}$	22	$\frac{1}{2}$ and $\frac{1}{2}$	1.65	2.25	377
379	$\frac{7}{8}$ and 1	$1\frac{1}{2}$ and $1\frac{1}{2}$	22	$\frac{1}{2}$ and $\frac{1}{2}$	1.65	2.25	379
380	$\frac{7}{8}$ and $1\frac{1}{8}$	$1\frac{1}{2}$ and $1\frac{1}{2}$	23	$\frac{3}{4}$ and $\frac{5}{8}$	1.95	2.65	380
382	1 and $1\frac{1}{8}$	$1\frac{1}{2}$ and $1\frac{1}{2}$	23	$\frac{3}{4}$ and $\frac{5}{8}$	1.95	2.65	382
383	1 and $1\frac{1}{4}$	$1\frac{1}{2}$ and $2\frac{1}{16}$	24	$\frac{3}{4}$ and $\frac{5}{8}$	2.25	3.15	383
385	$1\frac{1}{8}$ and $1\frac{1}{4}$	$1\frac{1}{2}$ and $2\frac{1}{16}$	24	$\frac{3}{4}$ and $\frac{5}{8}$	2.25	3.15	385
387	$1\frac{1}{8}$ and $1\frac{1}{2}$	$1\frac{1}{2}$ and $2\frac{1}{16}$	25	$\frac{3}{4}$ and $\frac{3}{4}$	3.40	4.50	387
389	$1\frac{1}{4}$ and $1\frac{1}{2}$	$2\frac{1}{16}$ and $2\frac{1}{16}$	25	$\frac{3}{4}$ and $\frac{3}{4}$	3.40	4.50	389

SINGLE HEAD SOCKET WRENCHES WITH OR WITHOUT PIN-HANDLE FOR HEXAGON NUTS AND CAP SCREWS

Straight Pattern with
Pin-Handle

FIG. 2198

In Stock with openings broached for U. S. Standard dimensions; also for Whitworth Standard and Metric Measure. Special broaching to order in reasonable quantities.

Hexagon end of shank is designed for use in combination with another wrench or with Pin-Handle.

Wrenches of shorter or longer lengths than stated in table can be furnished to order in quantities.

State class of wrench desired.

Offset Pattern



FIG. 2199

A full line of this Offset form of Socket Wrench adapted for Hexagon Nuts and Cap Screws can be furnished from stock. See price columns 1, 2 and 3.

Unless otherwise specified, wrenches with Pin-Handles will be sent. See extra prices for Handles.

Number	HEXAGON OPENINGS			Diameter of Head	Extreme Length and Diameter Shank or Handle		PRICE			
	For U. S. Std Nut; Size Bolt	For Cap Screw; Diam. Screw	Broch. Opening		Straight Pattern	Offset Pattern	Offset Handle, or Straight, With or Without Pin-Handle			Extra for Pin-Handle
							(1) Un-finished Either Offset or Straight, No Pin-Handle	(2) Semi-finished Either Offset or Straight, No Pin-Handle	(3) Fin-ished Either Offset or Straight, No Pin-Handle	
961A	1/8		21	1/8	3/8 & 4	3/8 & 37/8	\$0.20	\$0.30	\$0.40	\$0.10
962D		3/8	21	1/8	3/8 & 4 1/2	3/8 & 4 1/2	.22	.33	.44	.11
963A	3/8		21	1/8	3/8 & 4 7/8	3/8 & 4 7/8	.24	.35	.48	.13
963D		1/4	21	1/8	3/8 & 4 7/8	3/8 & 4 7/8	.24	.36	.48	.13
964A	1/4		21	1/8	3/8 & 5 1/4	3/8 & 5 1/4	.26	.39	.52	.13
965D		5/8	21	1/8	3/8 & 5 3/4	3/8 & 5 3/4	.29	.44	.58	.14
965A	5/8		21	1/8	3/8 & 5 3/4	3/8 & 5 3/4	.29	.44	.58	.14
966D		7/8	21	1	1/2 & 6 1/8	1/2 & 6 1/4	.32	.48	.64	.15
967A	3/8		21	1 1/8	1/2 & 6 1/2	1/2 & 6 3/4	.36	.54	.72	.17
967D		1/2	21	1 1/8	1/2 & 6 1/2	1/2 & 6 3/4	.36	.54	.72	.17
968A	7/8		21	1 1/4	5/8 & 7	5/8 & 7 1/2	.40	.60	.80	.17
968D		9/8	21	1 1/4	5/8 & 7	5/8 & 7 1/2	.40	.60	.80	.17
969A	1 1/2		21	1 3/8	5/8 & 7 3/8	5/8 & 8 3/8	.46	.69	.92	.18
970A	9/8		21	1 1/2	5/8 & 7 7/8	5/8 & 9 1/8	.52	.78	1.04	.20
970D		3/4	21	1 1/2	5/8 & 7 7/8	5/8 & 9 1/8	.52	.78	1.04	.20
971A	5/8		21	1 5/8	3/4 & 8 1/4	3/4 & 10	.60	.90	1.20	.20
971D		7/8	21	1 5/8	3/4 & 8 1/4	3/4 & 10	.60	.90	1.20	.20
973A	3/4	1	21	1 7/8	7/8 & 9 1/8	7/8 & 11 1/8	.80	1.20	1.60	.30
974D		1 1/8	21	1 7/8	7/8 & 9 1/2	7/8 & 12 3/8	.90	1.35	1.80	.35
975A	7/8		21	2 1/8	1 & 10	1 & 13 1/4	1.00	1.50	2.00	.35
975D		1 1/4	21	2 1/8	1 & 10	1 & 13 1/4	1.00	1.50	2.00	.35
976A	1		21	2 1/4	1 1/8 & 10 3/8	1 1/8 & 14 7/8	1.15	1.72	2.30	.40
977A	1 1/8		21	2 3/8	1 1/8 & 10 3/8	1 1/8 & 16 1/2	1.30	1.95	2.60	.45
978A	1 1/4		21	2 3/4	1 3/8 & 11 3/8	1 3/8 & 18 1/2	1.60	2.40	3.20	.45
979A	1 3/8		21	3	1 3/4 & 11 7/8	1 3/4 & 20	2.10	3.15	4.20	.50
980A	1 1/2		21	3 5/8	1 3/8 & 12 1/2	1 3/8 & 21 3/4	2.80	4.20	5.60	.65

SINGLE HEAD SOCKET WRENCHES **WITH OR WITHOUT PIN-HANDLE** **FOR SQUARE NUTS, CAP SCREWS AND SET SCREWS**

Straight Pattern with
Pin-Handle



FIG. 2200

In Stock with openings broached for U. S. Standard dimensions. Special broaching to order in reasonable quantities.

Hexagon end of shank is designed for use in combination with another wrench or with Pin-Handle.

Wrenches of shorter or longer lengths than stated in table can be furnished to order in quantities.

State class of wrenches desired.

Offset Pattern



FIG. 2201

A full line of this Offset form of Socket Wrench adapted for Square Nuts, Cap and Set Screws can be furnished from stock. See price columns 1, 2 and 3.

Unless otherwise specified, wrenches with Pin-Handles will be sent. See extra prices for Handles.

Number	SQUARE OPENINGS				Diameter of Head	Extreme Length and Diameter Shank or Handle		PRICE			
	For Set Screw, Size	For Cap Screw, Diam. Screw	For U. S. Standard Nut, Size Bolt	Broil Opening		Straight Pattern	Offset Pattern	Offset Handle or Straight Without Pin-Handle			Extra for Pin-Handle
								Un-finished	Semi-finished	Finished	
960H	1/8			1/8	5/16	1 1/2 & 3 3/4		\$.18	\$.27	\$.36	\$.08
961H	3/16			3/16	1/2	1 3/4 & 4		.20	.30	.40	.10
961J	1/4			1/4	1/2	1 3/4 & 4		.20	.30	.40	.10
962H	5/16			5/16	5/8	1 3/4 & 4 1/2	3 3/8 & 3 7/8	.22	.33	.44	.11
963H	3/8	1/4		3/8	3/4	1 3/4 & 4 7/8	3 3/8 & 4 5/8	.24	.36	.48	.13
965H	7/16	5/8		7/16	7/8	1 3/4 & 5 3/4	3 3/8 & 5 7/8	.29	.44	.58	.14
966H	1/2	3/4	1/4	1/2	1	1 3/4 & 6 1/8	3 3/8 & 6 1/2	.32	.48	.64	.15
967H	9/16	7/8		9/16	1 1/8	1 3/4 & 6 1/2	3 3/8 & 6 3/4	.36	.54	.72	.17
967X					1 1/8	1 3/4 & 6 3/4	3 3/8 & 6 3/4	.36	.54	.72	.17
968H	5/8	1 1/2	3/8	5/8	1 1/4	1 3/4 & 7	3 3/8 & 7 1/2	.40	.60	.80	.17
968P					1 1/4	1 3/4 & 7	3 3/8 & 7 1/2	.40	.60	.80	.17
969H	3/4	9/8	3/8	3/4	1 3/8	1 3/4 & 7 3/8	3 3/8 & 8 3/8	.46	.69	.92	.18
970X					1 1/2	1 3/4 & 7 3/8	3 3/8 & 9 1/8	.52	.78	1.04	.20
971H	7/8	3/4	7/8	7/8	1 5/8	1 3/4 & 8 1/4	3 3/8 & 10	.60	.90	1.20	.20
971X					1 5/8	1 3/4 & 8 1/4	3 3/8 & 10	.60	.90	1.20	.20
973H	1			1	1 7/8	1 3/4 & 9 1/8	3 3/8 & 11 5/8	.80	1.20	1.60	.30
974X			5/8	1 1/4	2	1 3/4 & 9 1/2	3 3/8 & 12 3/8	.90	1.35	1.80	.35
974H	1 1/8	7/8		1 1/8	2	1 3/4 & 9 1/2	3 3/8 & 12 3/8	.90	1.35	1.80	.35
976H	1 1/4	1	3/4	1 1/4	2 1/4	1 3/4 & 10 3/8	3 3/8 & 14 7/8	1.15	1.72	2.30	.40
977N		1 1/8		1 1/8	2 1/2	1 3/4 & 10 7/8	3 3/8 & 16 1/2	1.30	1.95	2.60	.45
977X			7/8	1 1/2	2 1/2	1 3/4 & 10 7/8	3 3/8 & 16 1/2	1.30	1.95	2.60	.45
977P		1 1/4		1 3/4	2 1/2	1 3/4 & 10 7/8	3 3/8 & 16 1/2	1.30	1.95	2.60	.45
978P		1 3/8	1	1 3/8	2 3/4	1 3/4 & 11 3/8	3 3/8 & 18 1/4	1.60	2.40	3.20	.45
979X			1 1/2	1 3/2	3	1 3/4 & 11 7/8	3 3/8 & 20	2.10	3.15	4.20	.50
980X			1 1/4	2 1/2	3 5/8	1 3/4 & 12 1/2	3 3/8 & 21 3/4	2.80	4.20	5.60	.65

"BULL DOG" WRENCHES



FIG. 2202

No. 1. $5\frac{3}{4}$ inches long. Holds pipe $\frac{1}{8}$ to $\frac{3}{8}$ -inch. Holds round iron $\frac{1}{4}$ to $\frac{3}{4}$ -inch.

Priceper dozen, \$4.00



FIG. 2204

No. 1 $\frac{3}{4}$. $7\frac{1}{16}$ inches long. Holds pipe $\frac{1}{8}$ to $\frac{3}{8}$ -inch. Holds round iron $\frac{3}{8}$ to $1\frac{1}{8}$ -inch.

Priceper dozen, \$8.00



FIG. 2203

No. 1 $\frac{1}{2}$. $5\frac{3}{4}$ inches long. Holds pipe $\frac{1}{8}$ to $\frac{3}{8}$ -inch. Holds round iron $\frac{1}{4}$ to $\frac{3}{4}$ -inch.

Priceper dozen, \$4.50



FIG. 2205



FIG. 2206

No.	Length, Inches	Holds Pipe Diameter, Inches	Holds Round Iron, Diameter, Inches	Price Per Dozen
2	9	$\frac{3}{8}$ to $\frac{3}{4}$	$\frac{1}{2}$ to 1	\$12.00
$2\frac{1}{2}$	$12\frac{1}{2}$	$\frac{3}{8}$ to 1	$\frac{5}{8}$ to $1\frac{1}{4}$	18.00



FIG. 2207

No.	Length, Inches	Holds Pipe Diameter, Inches	Holds Round Iron, Diameter, Inches	Price Per Dozen
3	16	$\frac{1}{2}$ to $1\frac{1}{4}$	$\frac{3}{4}$ to $1\frac{3}{8}$	\$24.00
$3\frac{1}{2}$	$18\frac{3}{4}$	$\frac{1}{2}$ to $1\frac{1}{2}$	$\frac{3}{4}$ to $1\frac{3}{4}$	30.00
4	22	$1\frac{1}{4}$ to 2	$1\frac{1}{2}$ to $2\frac{1}{2}$	36.00
$4\frac{1}{2}$	24	$1\frac{1}{4}$ to $2\frac{1}{2}$	$1\frac{5}{8}$ to 3	50.00
5	27	2 to 3	$2\frac{1}{4}$ to $3\frac{1}{2}$	60.00

TWIN WRENCHES



FIG. 2208

No.	Length, Inches	Holds Pipe Diameter, Inches	Holds Round Iron, Diameter, Inches	Price Per Dozen
Twin	10	$\frac{1}{8}$ to $\frac{3}{4}$	$\frac{1}{4}$ to 1	\$18.00

"ALWAYS READY" WRENCHES



FIG. 2209

No.	Length, In.	Holds Square or Round Iron, Diam., In.	Price Per Doz., Nick- eled	Price Per Doz., Black
1	5	1/4 to 3/4	\$ 5.00	\$ 4.60
2	7	1/4 to 1 1/4	6.75	6.30
2 1/2	9 1/2	1/4 to 1 3/4	10.50	10.00
3	11 1/2	3/4 to 2	16.00	15.25

SQUARE BRACE WRENCH

These wrenches are made of malleable, hardened so as to give the greatest durability together with maximum strength. They are nicely finished. Each size is accurately drifted to United States standard nut sizes. A shoulder prevents the nut working far up into the wrench and the open shank prevents clogging with dirt and also enables the user to handle the wrench in places where a brace would not go.



FIG. 2210

The following are stock sizes for square nuts. In ordering, give the length of one side of the square.

Stock No. 164. List price, per set, one each, of the following sizes:

3/16, 7/16, 1/2, 5/8, 3/4, 7/8, 1, 1 1/8 and 1 1/4 inch.....\$3.00

Size given is side of square of nut.

No. 151.	Per dozen	3/16 in.	\$1.75
No. 152.	Per dozen	7/16 in.	1.75
No. 153.	Per dozen	1/2 in.	2.00
No. 154.	Per dozen	5/8 in.	2.00
No. 155.	Per dozen	3/4 in.	2.50
No. 156.	Per dozen	7/8 in.	2.50
No. 157.	Per dozen	1 in.	3.00
No. 158.	Per dozen	1 1/8 in.	3.50
No. 159.	Per dozen	1 1/4 in.	4.00
No. 160.	Per dozen	1 1/2 in.	4.50
No. 161.	Per dozen	1 3/4 in.	5.00
No. 162.	Per dozen	1 7/8 in. long	3.00
No. 163.	Per dozen	2 in. long	3.50

HEXAGON BRACE WRENCH



FIG. 2211

The following is the list of stock sizes for Hexagon nuts. In ordering give the largest outside diameter of the nut.

Stock No. 174. List price per set one each of the following sizes:

3/8, 1/2, 5/8, 3/4, 7/8, 1, 1 1/8, 1 1/4.....\$2.50

Size given is largest outside diameter of nut.

No. 165.	Per dozen	3/8 in.	\$1.75
No. 166.	Per dozen	1/2 in.	1.75
No. 167.	Per dozen	5/8 in.	2.00
No. 168.	Per dozen	3/4 in.	2.00
No. 169.	Per dozen	7/8 in.	2.50
No. 170.	Per dozen	1 in.	3.00
No. 171.	Per dozen	1 1/8 in.	3.50
No. 172.	Per dozen	1 1/4 in.	4.50
No. 173.	Per dozen	1 1/2 in.	5.00

STARRETT PATENT RATCHET WRENCH NO. 443

In places difficult of access or in cramped quarters where a swing through a long arc is impossible, the ordinary monkey or S wrench is out of the question. Some other means of turning nuts and bolts is required. To meet these conditions we present the Starrett Ratchet Wrench. It consists of a ratchet with reversible pawl and a long wrench handle. With this wrench we furnish an extension to reach into otherwise inaccessible places; also a universal joint for turning nuts or bolts when it is impossible to get the wrench on at right angles to the ends of the bolt; a spark plug socket for use on automobiles; a drilling attachment which takes standard square shank drills from $\frac{1}{8}$ of an inch to $\frac{1}{2}$ inch diameter, and a screw driver with reversible end; together with several adjustments to go with the drilling attachment.

**FIG. 2212**

No. 443A. Complete \$15.00
 No. 443B. Without Drill Fixture..... 12.00
 Sent complete unless otherwise ordered.

MOSSBERG SOCKET WRENCH SET NO. 6

6-A Socket Wrench Set, Wood Case

6-B Socket Wrench Set, Leather Case

**FIG. 2213****FIG. 2214**

Packed in wooden box or leather case containing:

One Folding Handle, No. 310, $5\frac{1}{2}$ inches high.

Two sizes of Screw Driver Bits.

Eight sizes of hexagon, mottled, properly hardened, Pressed Steel Sockets, which fit sizes of standard nuts, set screws, and bolts, as follows:

Sizes of Sockets Hex. Inches	FITTING		
	U. S. Std. Hex. Nuts and Bolts	Hex. Hd. Cap Screws	S. A. E. Std. Hex. Nuts and Screws
	Bolt Size Inches	Screw Size Inches	Screw Size Inches
$\frac{1}{16}$	$\frac{1}{16}$	$\frac{5}{16}$	$\frac{5}{16}$
$\frac{1}{8}$	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{3}{8}$
$\frac{3}{16}$	$\frac{5}{16}$	$\frac{1}{2}$	$\frac{1}{2}$
$\frac{1}{4}$	$\frac{3}{8}$	..	..
$\frac{5}{16}$	$\frac{1}{2}$	$\frac{1}{2}$	..
$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{5}{8}$
$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$
$\frac{5}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$
$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{2}$	$1\frac{1}{2}$

One Special Spark Plug Socket, $\frac{11}{16}$ inch x 4 inches.**PRICES**

6-A packed in wooden case \$2.20
 6-B packed in leather-board case 2.20

MOSSBERG SOCKET WRENCH SETS



FIG. 2215

AUTOMOBILE SET NO. 10

An efficient owners' set, and for use in automobile repair and garage equipment.

This set is rated at five "man-power" in point of helpful service.

In wooden case containing:

Mossberg Ratchet Handle No. 350.

One Extension Bar, 9 $\frac{1}{2}$ inches long, No. 351.

One Universal Joint No. 336.

Two Screw Driver Bits.

Twenty-one mottled, properly hardened, Pressed Steel Sockets, as follows:

Sizes of Hex. Sockets Inches	FITTING			
	U. S. Std. Hex. Nuts and Bolts Bolt Size Inches	S. A. E. Std. Hex. Nuts and Screws Screw Size Inches	Manfrs Std. Hex. Hd. Bolts Bolt Size Inches	Hex. Head Cap Screws Screw Size Inches
$\frac{1}{16}$	..	$\frac{1}{16}$	..	$\frac{1}{16}$
$\frac{1}{8}$	..	..	$\frac{1}{8}$	..
$\frac{9}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	..	$\frac{5}{16}$
$\frac{1}{2}$	..	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$
$\frac{5}{8}$	$\frac{7}{16}$	..	..	..
$\frac{3}{4}$	..	$\frac{1}{2}$	..	$\frac{1}{2}$
$\frac{7}{8}$	..	..	$\frac{1}{2}$	..
1	$\frac{3}{8}$	..	..	..
$1\frac{1}{8}$	..	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
$1\frac{1}{4}$	$\frac{7}{16}$	..	..	..
$1\frac{3}{8}$	..	..	..	$\frac{3}{8}$
$1\frac{1}{2}$	..	..	$\frac{7}{16}$	..
$1\frac{3}{4}$	$\frac{1}{2}$	$\frac{9}{16}$	..	$\frac{9}{16}$
$1\frac{7}{8}$	..	$\frac{5}{8}$	$\frac{5}{8}$	..
2	$\frac{9}{16}$	..	..	..
$2\frac{1}{8}$	..	$\frac{3}{4}$	..	$\frac{3}{4}$
$2\frac{1}{4}$	$\frac{5}{8}$	$\frac{3}{4}$	..	..
$2\frac{3}{8}$	..	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$
$2\frac{1}{2}$	$\frac{3}{4}$	$\frac{7}{8}$	..	1

Two Special Hexagon Spark Plug Sockets:

4 inches long, $\frac{3}{16}$ inch openings.

4 inches long, $1\frac{1}{8}$ inch openings.

Fitting Standard Spark Plugs.

PRIC

Mossberg Socket Wrench Set No. 10, complete in wooden box.....\$8.00

Sets with special assortments Mossberg Guaranteed Sockets furnished upon request.

MOSSBERG SOCKET WRENCH SET NO. 14

Largest, Most Complete Socket Wrench
Set Ever Marketed

On account of the cleverness of the No. 350 Handle in its applications—and the full equipment of this set—the No. 14 set is Mossberg Company's recommendation for all cases where quick work is desired. Every tool is included that is required for work by machinists, automobile repair men and marine engineers.



FIG. 2216

In wooden box containing:

- 1 Mossberg Ratchet Wrench No. 350 and extension bar.
- 1 Mossberg No. 340 Take-down Handle and extension bar.
- 1 Mossberg No. 320 Offset Socket Wrench.
- 1 Sterling No. 100 finest Nickeled Plier.
- 1 "Gripsall" Pipe Wrench No. 470.
- 1 No. 1 General Service Double-End Wrench Set, extra finished, ten different openings.
- 1 Universal Joint.
- 3 Special Spark Plug Sockets, sizes $\frac{3}{16}$ inch, $1\frac{1}{2}$ inches and $1\frac{1}{2}$ inches.
- 3 Screw Driver Bits.
- 1 Cotter Pin Extractor No. 1.
- 23 sizes, thoroughly hardened and mottled finish Hex. Sockets.
- 11 sizes, thoroughly hardened and mottled finish Square Sockets.

HEXAGON

SQUARE

Sizes of Hex. Sockets Inches	FITTING					Sizes of Square Sockets Inches	FITTING			
	U.S. Std. Hex. Nuts and Bolts. Bolt Size Inches	S. A. E. Std. Hex. Nuts and Screws Screw Size Inches	Manu'ls Std. Hex. Bd. Bolts Bolt Size Inches	Hex. Head Cap Screws Screw Size Inches	Hex. Head Coach Screws Screw Size Inches		Square Head Cap Screws Screw Size, In.	Square Head Set Screws Screw Size, In.	Square Head Coach Screws Screw Size, In.	U.S. Std. Square Nuts Screw Size, In.
$\frac{5}{16}$	..	..	..	..	..	..	..	..	..	..
$\frac{3}{8}$	..	..	..	..	..	..	..	..	..	..
$\frac{1}{2}$	..	..	$\frac{1}{4}$	..	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{4}$	..
$\frac{9}{16}$	..	$\frac{1}{4}$	..	..	..	..	..	..	..	..
$\frac{5}{8}$	..	..	..	$\frac{1}{4}$	..	..	$\frac{3}{8}$	$\frac{1}{2}$	..	..
$\frac{11}{16}$	..	..	$\frac{1}{8}$	..	$\frac{1}{8}$	$\frac{5}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	..	$\frac{1}{4}$
$\frac{3}{4}$	$\frac{1}{4}$	$\frac{3}{8}$	..	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{8}$	..
$\frac{7}{8}$	..	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{7}{8}$	..	..	..	..
$\frac{15}{16}$	$\frac{3}{8}$	$\frac{7}{8}$	..	..	..	$\frac{15}{16}$	$\frac{1}{2}$	$\frac{3}{4}$	..	$\frac{3}{8}$
1	..	..	$\frac{1}{2}$	..	$\frac{1}{2}$	1	$\frac{3}{4}$	..	..	$\frac{7}{8}$
$1\frac{1}{8}$	..	..	..	$\frac{1}{2}$	$\frac{1}{2}$	$1\frac{1}{8}$	..	..	..	..
$1\frac{1}{4}$	..	$\frac{1}{2}$	$\frac{1}{2}$	..	$\frac{1}{2}$	$1\frac{1}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{1}{2}$	..
$1\frac{3}{8}$	$\frac{1}{2}$	..	..	..	..	..	..	..	..	..
$1\frac{1}{2}$	..	..	..	$\frac{3}{4}$	$\frac{3}{4}$	..	..	..	..	..
$1\frac{3}{4}$	..	..	..	..	..	..	..	..	..	..
2	..	..	..	..	..	2	..	..	..	..
$2\frac{1}{8}$	..	..	..	..	..	$2\frac{1}{8}$	..	..	..	..
$2\frac{1}{4}$	..	..	..	..	..	$2\frac{1}{4}$	..	..	..	..
$2\frac{3}{8}$	..	..	..	..	..	$2\frac{3}{8}$	..	..	..	..
$2\frac{1}{2}$	..	..	..	..	..	$2\frac{1}{2}$	..	..	..	..
$2\frac{3}{4}$	..	..	..	..	..	$2\frac{3}{4}$	..	..	..	..
3	..	..	..	..	..	3	..	..	..	..
$3\frac{1}{8}$	..	..	..	..	..	$3\frac{1}{8}$	..	..	..	..
$3\frac{1}{4}$	..	..	..	..	..	$3\frac{1}{4}$	..	..	..	..
$3\frac{3}{8}$	..	..	..	..	..	$3\frac{3}{8}$	..	..	..	..
$3\frac{1}{2}$	..	..	..	..	..	$3\frac{1}{2}$	..	..	..	..
$3\frac{3}{4}$	..	..	..	..	..	$3\frac{3}{4}$	..	..	..	..
4	..	..	..	..	..	4	..	..	..	..
$4\frac{1}{8}$	..	..	..	..	..	$4\frac{1}{8}$	..	..	..	..
$4\frac{1}{4}$	..	..	..	..	..	$4\frac{1}{4}$	..	..	..	..
$4\frac{3}{8}$	..	..	..	..	..	$4\frac{3}{8}$	..	..	..	..
$4\frac{1}{2}$	..	..	..	..	..	$4\frac{1}{2}$	..	..	..	..
$4\frac{3}{4}$	..	..	..	..	..	$4\frac{3}{4}$	..	..	..	..
5	..	..	..	..	..	5	..	..	..	..
$5\frac{1}{8}$	..	..	..	..	..	$5\frac{1}{8}$	..	..	..	..
$5\frac{1}{4}$	..	..	..	..	..	$5\frac{1}{4}$	..	..	..	..
$5\frac{3}{8}$	..	..	..	..	..	$5\frac{3}{8}$	..	..	..	..
$5\frac{1}{2}$	..	..	..	..	..	$5\frac{1}{2}$	..	..	..	..
$5\frac{3}{4}$	..	..	..	..	..	$5\frac{3}{4}$	..	..	..	..
6	..	..	..	..	..	6	..	..	..	..
$6\frac{1}{8}$	..	..	..	..	..	$6\frac{1}{8}$	..	..	..	..
$6\frac{1}{4}$	..	..	..	..	..	$6\frac{1}{4}$	..	..	..	..
$6\frac{3}{8}$	..	..	..	..	..	$6\frac{3}{8}$	..	..	..	..
$6\frac{1}{2}$	..	..	..	..	..	$6\frac{1}{2}$	..	..	..	..
$6\frac{3}{4}$	..	..	..	..	..	$6\frac{3}{4}$	..	..	..	..
7	..	..	..	..	..	7	..	..	..	..
$7\frac{1}{8}$	..	..	..	..	..	$7\frac{1}{8}$	..	..	..	..
$7\frac{1}{4}$	..	..	..	..	..	$7\frac{1}{4}$	..	..	..	..
$7\frac{3}{8}$	..	..	..	..	..	$7\frac{3}{8}$	..	..	..	..
$7\frac{1}{2}$	..	..	..	..	..	$7\frac{1}{2}$	..	..	..	..
$7\frac{3}{4}$	..	..	..	..	..	$7\frac{3}{4}$	..	..	..	..
8	..	..	..	..	..	8	..	..	..	..
$8\frac{1}{8}$	..	..	..	..	..	$8\frac{1}{8}$	..	..	..	..
$8\frac{1}{4}$	..	..	..	..	..	$8\frac{1}{4}$	..	..	..	..
$8\frac{3}{8}$	..	..	..	..	..	$8\frac{3}{8}$	..	..	..	..
$8\frac{1}{2}$	..	..	..	..	..	$8\frac{1}{2}$	..	..	..	..
$8\frac{3}{4}$	..	..	..	..	..	$8\frac{3}{4}$	..	..	..	..
9	..	..	..	..	..	9	..	..	..	..
$9\frac{1}{8}$	..	..	..	..	..	$9\frac{1}{8}$	..	..	..	..
$9\frac{1}{4}$	..	..	..	..	..	$9\frac{1}{4}$	..	..	..	..
$9\frac{3}{8}$	..	..	..	..	..	$9\frac{3}{8}$	..	..	..	..
$9\frac{1}{2}$	..	..	..	..	..	$9\frac{1}{2}$	..	..	..	..
$9\frac{3}{4}$	..	..	..	..	..	$9\frac{3}{4}$	..	..	..	..
10	..	..	..	..	..	10	..	..	..	..
$10\frac{1}{8}$	..	..	..	..	..	$10\frac{1}{8}$	..	..	..	..
$10\frac{1}{4}$	..	..	..	..	..	$10\frac{1}{4}$	..	..	..	..
$10\frac{3}{8}$	..	..	..	..	..	$10\frac{3}{8}$	..	..	..	..
$10\frac{1}{2}$	..	..	..	..	..	$10\frac{1}{2}$	..	..	..	..
$10\frac{3}{4}$	..	..	..	..	..	$10\frac{3}{4}$	..	..	..	..
11	..	..	..	..	..	11	..	..	..	..
$11\frac{1}{8}$	..	..	..	..	..	$11\frac{1}{8}$	..	..	..	..
$11\frac{1}{4}$	..	..	..	..	..	$11\frac{1}{4}$	..	..	..	..
$11\frac{3}{8}$	..	..	..	..	..	$11\frac{3}{8}$	..	..	..	..
$11\frac{1}{2}$	..	..	..	..	..	$11\frac{1}{2}$	..	..	..	..
$11\frac{3}{4}$	..	..	..	..	..	$11\frac{3}{4}$	..	..	..	..
12	..	..	..	..	..	12	..	..	..	..
$12\frac{1}{8}$	..	..	..	..	..	$12\frac{1}{8}$	..	..	..	..
$12\frac{1}{4}$	..	..	..	..	..	$12\frac{1}{4}$	..	..	..	..
$12\frac{3}{8}$	..	..	..	..	..	$12\frac{3}{8}$	..	..	..	..
$12\frac{1}{2}$	..	..	..	..	..	$12\frac{1}{2}$	..	..	..	..
$12\frac{3}{4}$	..	..	..	..	..	$12\frac{3}{4}$	..	..	..	..
13	..	..	..	..	..	13	..	..	..	..
$13\frac{1}{8}$	..	..	..	..	..	$13\frac{1}{8}$	..	..	..	..
$13\frac{1}{4}$	..	..	..	..	..	$13\frac{1}{4}$	..	..	..	..
$13\frac{3}{8}$	..	..	..	..	..	$13\frac{3}{8}$	..	..	..	..
$13\frac{1}{2}$	..	..	..	..	..	$13\frac{1}{2}$	..	..	..	..
$13\frac{3}{4}$	..	..	..	..	..	$13\frac{3}{4}$	..	..	..	..
14	..	..	..	..	..	14	..	..	..	..
$14\frac{1}{8}$	..	..	..	..	..	$14\frac{1}{8}$	..	..	..	..
$14\frac{1}{4}$	..	..	..	..	..	$14\frac{1}{4}$	..	..	..	..
$14\frac{3}{8}$	..	..	..	..	..	$14\frac{3}{8}$	..	..	..	..
$14\frac{1}{2}$	..	..	..	..	..	$14\frac{1}{2}$	..	..	..	..
$14\frac{3}{4}$	..	..	..	..	..	$14\frac{3}{4}$	..	..	..	..
15	..	..	..	..	..	15	..	..	..	..
$15\frac{1}{8}$	..	..	..	..	..	$15\frac{1}{8}$	..	..	..	..
$15\frac{1}{4}$	..	..	..	..	..	$15\frac{1}{4}$	..	..	..	..
$15\frac{3}{8}$	..	..	..	..	..	$15\frac{3}{8}$	..	..	..	..
$15\frac{1}{2}$	..	..	..	..	..	$15\frac{1}{2}$	..	..	..	..
$15\frac{3}{4}$	..	..	..	..	..	$15\frac{3}{4}$	..	..	..	..
16	..	..	..	..	..	16	..	..	..	..
$16\frac{1}{8}$	..	..	..	..	..	$16\frac{1}{8}$	..	..	..	..
$16\frac{1}{4}$	..	..	..	..	..	$16\frac{1}{4}$	..	..	..	..
$16\frac{3}{8}$	..	..	..	..	..	$16\frac{3}{8}$	..	..	..	..
$16\frac{1}{2}$	..	..	..	..	..	$16\frac{1}{2}$	..	..	..	..
$16\frac{3}{4}$	..	..	..	..	..	$16\frac{3}{4}$	..	..	..	..
17	..	..	..	..	..	17	..	..	..	..
$17\frac{1}{8}$	..	..	..	..	..	$17\frac{1}{8}$	..	..	..	..
$17\frac{1}{4}$	..	..	..	..	..	$17\frac{1}{4}$	..	..	..	..
$17\frac{3}{8}$	..	..	..	..	..	$17\frac{3}{8}$	..	..	..	..
$17\frac{1}{2}$	..	..	..	..	..	$17\frac{1}{2}$	..	..	..	..
$17\frac{3}{4}$	..	..	..	..	..	$17\frac{3}{4}$	..	..	..	..
18	..	..	..	..	..	18	..	..	..	..
$18\frac{1}{8}$	..	..	..	..	..	$18\frac{1}{8}$	..	..	..	..
$18\frac{1}{4}$	..	..	..	..	..	$18\frac{1}{4}$	..	..	..	..
$18\frac{3}{8}$	..	..	..	..	..	$18\frac{3}{8}$	..	..	..	..
$18\frac{1}{2}$	..	..	..	..	..	$18\frac{1}{2}$	..	..	..	..
$18\frac{3}{4}$	..	..	..	..	..	$18\frac{3}{4}$	..	..	..	..
19	..	..	..	..	..	19	..	..	..	..
$19\frac{1}{8}$	..	..	..	..	..	$19\frac{1}{8}$	..	..	..	..
$19\frac{1}{4}$	..	..	..	..	..	$19\frac{1}{4}$	..	..	..	..
$19\frac{3}{8}$	..	..	..	..	..	$19\frac{3}{8}$	..	..	..	..
$19\frac{1}{2}$	..	..	..	..	..	$19\frac{1}{2}$	..	..	..	..
$19\frac{3}{4}$	..	..	..	..	..	$19\frac{3}{4}$	..	..	..	..
20	..	..	..	..	..	20	..	..	..	..
$20\frac{1}{8}$	..	..	..	..	..	$20\frac{1}{8}$	..	..	..	..
$20\frac{1}{4}$	..	..	..	..	..	$20\frac{1}{4}$	..	..	..	..
$20\frac{3}{8}$	..	..	..	..	..	$20\frac{3}{8}$	..	..	..	..
$20\frac{1}{2}$	..	..	..	..	..	$20\frac{1}{2}$	..	..	..	..
$20\frac{3}{4}$	..	..	..	..	..	$20\frac{3}{4}$	..	..	..	..
21	..	..	..	..	..	21	..	..	..	..
$21\frac{1}{8}$	..	..	..	..	..	$21\frac{1}{8}$	..	..	..	..
$21\frac{1}{4}$	..	..	..	..	..	$21\frac{1}{4}$	..	..	..	..
$21\frac{3}{8}$	..	..	..	..	..	$21\frac{3}{8}$	..	..	..	..
$21\frac{1}{2}$	..	..	..	..	..	$21\frac{1}{2}$	..	..	..	..
$21\$										

CRESCENT ADJUSTABLE WRENCH



FIG. 2217

Size, in.	Weight,	Capacity, in.	POLISHED		NICKELED	
			Per Doz.	Each	Per Doz.	Each
4	2 oz.	$\frac{1}{2}$	\$ 7.80	.65	9.60	.80
6	5 oz.	$\frac{3}{4}$	7.80	.65	9.60	.80
8	10 oz.	$1\frac{1}{8}$	9.60	.80	12.00	1.00
10	18 oz.	$1\frac{1}{2}$	12.00	1.00	15.00	1.25
12	2 lbs.	$1\frac{3}{4}$	15.00	1.25	19.20	1.60
15	4 lbs. 5 oz.	$2\frac{1}{4}$	19.20	1.60	24.00	2.00
18	7 lbs.	$2\frac{1}{2}$	27.00	2.25	36.00	3.00



FIG. 2218

No. 76.	6-inch, opens to $\frac{3}{4}$ inch	per dozen, \$ 8.00
No. 78.	8-inch, opens to 1 inch	per dozen, 10.00
No. 80.	10-inch, opens to $1\frac{1}{8}$ inches	per dozen, 12.00
No. 82.	12-inch, opens to $1\frac{1}{2}$ inches	per dozen, 15.00
No. 84.	14-inch, opens to 2 inches	per dozen, 21.00

“WESTCOTT”
ADJUSTABLE “S” PIPE
WRENCH



FIG. 2219

No. 76P.	6-inch, takes pipe from $\frac{1}{8}$ to $\frac{3}{8}$ -inch	per dozen, \$ 8.00
No. 78P.	8-inch, takes pipe from $\frac{1}{8}$ to $\frac{3}{4}$ -inch	per dozen, 10.00
No. 80P.	10-inch, takes pipe from $\frac{1}{8}$ to 1 -inch	per dozen, 12.00
No. 82P.	12-inch, takes pipe from $\frac{1}{8}$ to $1\frac{1}{4}$ -inch	per dozen, 15.00
No. 84P.	14-inch, takes pipe from $\frac{1}{8}$ to $1\frac{1}{2}$ -inch	per dozen, 21.00

SEPARATE PARTS FOR “WESTCOTT” WRENCHES



FIG. 2220

No. 1 handle; No. 2, nut jaw; No. 3, thumb screw; No. 4, pin (for thumb screw); No. 5, pipe jaw.

Size	6	8	10	12	14
Jaws, nut	\$0.15	.20	.30	.35	.40
Jaws, pipe	.25	.35	.40	.50	.60
Thumb screws	.10	.12	.15	.15	.20

Pins, 5 cents each extra.

When ordering jaws, please specify whether for nut or pipe wrenches, also for what size of wrench.

COES KEY MODEL SCREW WRENCH



FIG. 2221

	Length Over All	Opens, Inches	Weight, Pounds	Price, Each
28-inch takes hexagon nut union on 4-inch pipe.....	28	5 1/8	19	\$12.00
36-inch takes hexagon nut union on 5-inch pipe.....	36	6 1/4	27	26.00
48-inch takes a 9-inch hexagon nut.....	48	9 1/2	62	57.50



FIG. 2222

COES 91 STEEL HANDLE SCREW WRENCH

CASE CONTAINS

Size	Full	Half	Extra	Per Dozen
6 inches	6 dozen	3 dozen	.....	\$10.00
8 inches	6 dozen	3 dozen	.....	12.00
10 inches	6 dozen	3 dozen	9 dozen	14.00
12 inches Ball Bearing	6 dozen	3 dozen	4 dozen	18.00
15 inches Ball Bearing	3 dozen	1 1/2 dozen	2 dozen	24.00
18 inches Ball Bearing	2 dozen	1 dozen	.....	32.00
21 inches Ball Bearing	1 dozen	1/2 dozen	.....	39.00

COES KNIFE HANDLE SCREW WRENCH



FIG. 2223

CASE CONTAINS

Size	Full	Half	Extra	Blacks, per Dozen	Bright, per Dozen	Size	Full	Half	Extra	Blacks, per Dozen	Bright, per Dozen
6 in.	6 doz.	3 doz.	.....	\$10.00	14.00	15 in.	3 doz.	1 1/2 doz.	2 doz.	\$24.00	32.00
8 in.	6 doz.	3 doz.	.....	12.00	16.00	18 in.	2 doz.	1 doz.	.....	32.00	42.00
10 in.	6 doz.	3 doz.	.....	14.00	19.00	21 in.	1 doz.	1/2 doz.	.....	39.00	51.00
12 in.	6 doz.	3 doz.	4 doz.	18.00	24.00	.....	.....	.....	.....	.....	.....



FIG. 2224

"BESTOVALL" SOLID HANDLE WRENCH

"The 'Bestovall' Wrench is made with the head and bar drop forged in one piece from Open Hearth Steel. The screw and knurl are one solid piece of steel, the thread being deeply cut, both on the screw and in the jaw. The iron handle is of a shape that fits the hand perfectly. This Wrench is undoubtedly the strongest Wrench of its class made to day."

Size	inches	6	8	10	12	15	18	21
Opening	inches	1	1 1/16	1 1/8	2 1/16	2 5/8	3	3 1/8
List price	per dozen	\$10.00	12.00	14.00	18.00	24.00	32.00	39.00

MACHINIST'S KNIFE HANDLE WRENCHES
ONE PIECE, SOLID STEEL FORGING
BY ACTUAL TESTS THE STRONGEST WRENCH MADE

**FIG. 2225**

Size	inches	6	8	10	12	15	18	21
Jaws Open	inches	1	1½	1¾	2¼	2½	3	3½
Price	per dozen	\$10.00	12.00	14.00	18.00	24.00	32.00	39.00

“RAILROAD SPECIAL” WRENCHES

**FIG. 2226**

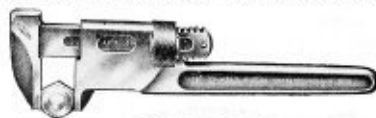
Size	inches	6	8	10	12	15	18	21
Jaws Open	inches	1	1½	1¾	2¼	2½	3	3½
Price	per dozen	\$10.00	12.00	14.00	18.00	24.00	32.00	39.00

AGRICULTURAL OR REGULAR WRENCHES

**FIG. 2227**

Size	inches	6	8	10	12	15
Jaws Open	inches	¾	1½	1¾	2½	2¾
Price	per dozen	\$10.00	12.00	14.00	18.00	24.00

TRIMO MONKEY WRENCHES

Showing Nut
Guards Separate**FIG. 2228**Nut with Guards
Inserted

Sizes	inches	6	8	10	12	15	18	21
Semi-bright— Wrenches.....	per dozen	\$10.00	12.00	14.00	18.00	24.00	32.00	39.00
Polished Wrenches.....	per dozen	14.00	16.00	19.00	24.00	32.00	42.00	51.00
Semi-bright— Jaw with Pin.....	each	.50	.60	.70	.80	1.20	1.35	1.65
Handle with Housing.....	each	.50	.55	.65	.75	1.20	1.60	1.90
Nut	each	.10	.10	.14	.18	.21	.25	.33
Nut Guards.....	per pair	.15	.15	.20	.30	.35	.40	.45
Polished— Jaw with Pin.....	each	.68	.80	.95	1.00	1.50	1.70	2.00
Handle with Housing.....	each	.68	.74	.88	1.00	1.50	2.00	2.40

BRIGGS PATTERN NUT WRENCH



FIG. 2229

Is provided with a Long Nut or Sleeve whereby the whole hand can be applied in making adjustments, thus giving greatly increased power to the jaws or worn-out nuts. It is especially useful in cold weather, as it can be operated with your mittens on.

NO. 36 BRIGHT

NO. 38 BLACK

Size	inches	8	10	12	15	18
Opens Nut	inches	1 $\frac{3}{4}$	2 $\frac{1}{8}$	2 $\frac{1}{4}$	2 $\frac{3}{4}$	4
No. 36, Bright	per dozen	\$16.00	19.00	24.00	32.00	42.00
No. 38, Black	per dozen	12.00	14.00	18.00	24.00	32.00

B. & C. COMBINATION PIPE AND NUT WRENCH
WITH SHORT NUT

FIG. 2230

This Wrench is especially useful on general work, as it obviates employing two wrenches. For general utility and all around convenience it has no equal.

NO. 43 BRIGHT

NO. 44 BLACK

Size	inches	8	10	12	15	18
Fits pipe	inches	$\frac{1}{4}$ to $\frac{3}{4}$	$\frac{1}{4}$ to 1	$\frac{1}{2}$ to 1 $\frac{3}{4}$	$\frac{1}{2}$ to 2 $\frac{1}{4}$	$\frac{1}{2}$ to 3
Prices, Either Style.....	per dozen	\$21.00	23.00	26.00	37.00	66.00

COMBINATION PIPE AND NUT WRENCH
WITH LONG NUT

FIG. 2231

NO. 45 BRIGHT

NO. 46 BLACK

Size	inches	8	10	12	15	18
Fits Pipe	inches	$\frac{1}{4}$ to $\frac{3}{4}$	$\frac{1}{4}$ to 1	$\frac{1}{2}$ to 1 $\frac{3}{4}$	$\frac{1}{2}$ to 2 $\frac{1}{4}$	$\frac{1}{2}$ to 3
Prices, Either Style.....	per dozen	\$23.00	25.25	28.50	40.50	72.00

GENUINE STILLSON PIPE WRENCHES

Wood Handle, 6 to 18-inch

Steel Handle, 6 to 48-inch

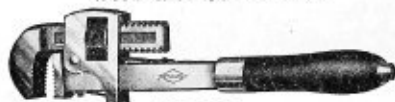


FIG. 2232



FIG. 2233

Length, open inches	6	8	10	14	18	24	36	48
Takes pipe inches	$\frac{1}{2}$ to $\frac{3}{8}$	$\frac{3}{8}$ to $\frac{1}{2}$	$\frac{1}{2}$ to 1	$\frac{3}{4}$ to 1 $\frac{1}{2}$	$\frac{1}{2}$ to 2	$\frac{3}{4}$ to 2 $\frac{1}{2}$	$\frac{1}{2}$ to 3 $\frac{1}{2}$	1 to 5
Wrenches each	\$2.00	\$2.25	\$2.50	\$3.50	\$5.00	\$7.25	\$13.50	\$20.00



Jaw



Frame



Wood Handle



Nut

Size inches	6	8	10	14	18	24	36	48
Jaws each	\$ 0.75	\$ 0.80	\$ 0.85	\$ 1.15	\$ 1.75	\$ 2.25	\$ 4.35	\$ 7.50
Frames	.38	.42	.50	.60	.75	.95	1.70	2.20
Adjusting nuts	.12	.15	.20	.30	.35	.55	1.10	1.50
Wood handles	.16	.18	.25	.28	.38	.45	.75	1.00
End nuts	.15	.15	.20	.20	.20	.20	.20	.20
Frame pins	.03	.03	.04	.04	.04	.04	.05	.05
Spring rivets	.01	.01	.02	.02	.02	.02	.02	.02
Springs	.10	.10	.10	.10	.10	.11	.13	.13
Bars, with springs	.95	1.00	1.10	1.50	2.25	3.50	7.00	10.50
Number of springs to each wrench	1	1	3	3	3	3	1	1

Ten-inch and larger Wrenches will always be sent with steel handles unless otherwise specified.

TRIMO PIPE WRENCHES

Wood Handles,
Sizes 6, 8, 10 and 14 inches onlySteel Handles
All Sizes

FIG. 2234



FIG. 2235

Movable
Jaw

Frame

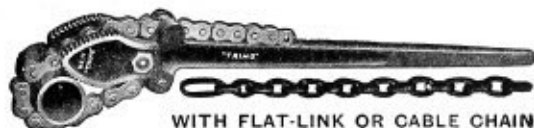
Insert
Jaw

Nut

Spring
and PinNut with
Nut Guards

Length, open inches	6	8	10	14	18	24	36	48
Taking pipe inches	$\frac{3}{8}$ to $\frac{1}{2}$	$\frac{1}{2}$ to $\frac{3}{4}$	$\frac{3}{4}$ to 1	$\frac{1}{2}$ to 1 $\frac{1}{2}$	$\frac{1}{2}$ to 2	$\frac{3}{4}$ to 2 $\frac{1}{2}$	$\frac{1}{2}$ to 3 $\frac{1}{2}$	1 to 5
Wrenches each	\$ 2.00	\$ 2.25	\$ 2.50	\$ 3.50	\$ 5.00	\$ 7.25	\$13.50	\$20.00
Movable jaws	.75	.80	.85	1.15	1.75	2.25	4.35	7.50
Nuts	.12	.15	.20	.30	.35	.55	1.10	1.50
Insert jaws	.35	.40	.50	.60	.70	.80	1.10	2.00
Frames	.38	.42	.50	.60	.75	.95	1.70	2.20
Springs	.03	.03	.03	.03	.04	.04	.04	.04
Frame pins	.03	.03	.04	.04	.04	.04	.05	.05
Jaw pins	.03	.03	.04	.04	.04	.04	.05	.05
Steel handles	.95	1.00	1.10	1.50	2.25	3.50	7.00	10.50
Wood handles with ferrules	.16	.16	.18	.25	.35	.45	.55	.65
Nut guards per pair	.15	.15	.20	.30	.35	.45	.55	.65

TRIMO CHAIN WRENCH



WITH FLAT-LINK OR CABLE CHAIN

FIG. 2236

Complete Wrench	No. 10	No. 11	No. 12	No. 13
With Flat-Link Chain.....each {	\$2.50	\$3.50	\$5.00	\$7.00
or with Cable Chain.....each }				
Capacity, Size Pipe.....inches	$\frac{1}{8}$ to 1	$\frac{1}{8}$ to 2	$\frac{1}{4}$ to 3	$\frac{3}{4}$ to 4
Length Over All.....inches	14	21	28	36
Weight of Wrench, each.....lbs.	2	5	9	15
Extra Flat-Link Chains.....each {	.75	1.00	1.50	2.50
or Extra Cable Chains.....each }				
Extra Jaws .....per pair	1.00	1.75	2.75	4.00
Extra Jaw Bolts and Nuts.. each	.20	.25	.35	.45
Extra Pin for Fastening Chain.....	.10	.10	.10	.12

Complete Wrench	No. 13½	No. 14	No. 15	No. 16
With Flat-Link Chain.....each {	\$9.00	\$11.00	\$18.00	\$30.00
or with Cable Chain .....each }				
Capacity, Size Pipe.....inches	1 to 6	1½ to 8	2 to 12	2 to 15
Length Over All.....inches	44	51	65	78
Weight of Wrench, each.....lbs.	22	30	61	102
Extra Flat-Link Chains.....each {	3.50	4.50	7.50	15.00
or Extra Cable Chains.....each }				
Extra Jaws .....per pair	4.75	5.50	7.50	12.00
Extra Jaw Bolts and Nuts.....each	.55	.70	.90	1.40
Extra Pin for Fastening Chain.....	.12	.12	.15	.20

BROCK STANDARD CHAIN PIPE & FITTINGS WRENCH



FIG. 2237

Solid jaw in solid head. Two wrenches in one. Grips beaded and plain fittings, valves and surfaces of all kinds. By reason of its new and exclusive feature—the half link adjustment—the plumber and steamfitter is enabled to do all of his work with one wrench. The only chain wrench without a bolt to break. Jaws inserted in head. The capacity of this wrench is larger than any other. The jaw can be replaced at half the cost of other chain wrenches. Can be used in narrow and difficult places.

Sizes	No. 11	No. 12	No. 13	No. 13½	No. 14	No. 15
Price .....each	\$3.50	\$5.00	\$7.00	\$9.00	\$11.00	\$18.00
Capacity ...inches	$\frac{1}{4}$ to 2	$\frac{1}{4}$ to 3	$\frac{3}{4}$ to 6	1 to 8	1½ to 10	2 to 14
Length .....inches	20	27	37	44	50	64
Weight ....pounds	5	8	16	21	28	45
Extra Chains.....each	\$1.00	\$1.50	\$2.50	\$3.50	\$4.50	\$7.50
Extra Jaws ...each	.90	1.40	2.00	2.00	2.75	3.50

WILLIAMS' IMPROVED "VULCAN" CHAIN PIPE WRENCH

Supplied With Flat Link Chain Only
With Double-Ended Reversible Jaws



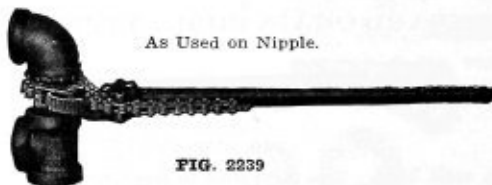
FIG. 2238

Number	30	31	32	33	33½	34	35	*16
*Capacity, Size Pipe...	½ to ¾	½ to 1½	¾ to 2½	¾ to 4	1 to 6	1½ to 8	2 to 12	4 to 18
Extreme Length...in.	13¾	20	27	37	44½	50½	64½	87
Weight .....lbs.	2¾	5¾	10	16	24	31	50	137
Flat Link Chain—								
Length .....ins.	9½	13½	17½	22½	31	39	54½	74½
Breaking Strain...lbs.	3,600	6,700	9,800	12,500	14,300	15,700	21,600	40,000
Price—								
Complete Wrench ..	\$2.50	3.50	5.00	7.00	9.00	11.00	18.00	40.00
Extra Chain	.75	1.00	1.50	2.50	3.50	4.50	7.50	20.00
Extra Jaws ....pair	1.00	1.75	2.75	4.00	4.75	5.50	7.50	16.00
Extra Nuts and Studs for Jaws....per set	.20	.25	.35	.45	.55	.70	.90	....

*Wrenches for pipe sizes larger than 12 inches are only supplied in the non-reversible jaw form.

"AGRIPPA" DROP-FORGED CHAIN PIPE AND FITTINGS WRENCH

With Single Jaw and Flat Link Chain only, for Turning or Holding both Pipe and Fittings from ¼ to 12 inches diameter.



As Used on Nipple.

FIG. 2239

Number	20	21	22	23	23½	24	25
Capacity—							
Fittings	½ to ¾	½ to 1½	¾ to 2½	¾ to 4	1 to 6	1½ to 8	2 to 12
Extreme L'gth.ins.	13¾	20	27	37	44½	50½	64½
Weight .....lbs.	2½	5¾	9¾	17	24	32	56
Chain—							
Length .....ins.	10	15	19½	26	34	45	61
Break'g Strain...lbs.	3,600	6,700	9,800	12,500	14,300	15,700	21,800
Price—							
Complete Wrench.	\$2.50	3.50	5.00	7.00	9.00	11.00	18.00
Extra Chain	1.00	1.25	1.75	2.75	4.00	5.00	8.00
Extra Jaws...each	1.00	1.75	2.75	4.00	4.75	5.50	7.50

WALCO ADJUSTABLE HEX WRENCH

No. 0, for automobile use and small bibbs, cocks, etc.

Nos. 1 and 2, for making up valves, cocks, bibbs, etc., and removing valve bonnets.



FIG. 2241

	Size of Hex. Across Flats	Length Open Inches	Length Closed Inches	List Price Each
No. 0	$\frac{1}{2}$ to 1	$8\frac{1}{4}$	$7\frac{3}{8}$	\$ 1.75
No. 1	$\frac{3}{4}$ to $1\frac{1}{16}$	14	13	5.00
No. 2	$1\frac{1}{2}$ to $2\frac{3}{8}$	25	23	10.00

PARMELEE PIPE WRENCH

ESPECIALLY ADAPTED FOR HANDLING BRASS PIPE, SMOOTH RODS OR NICKEL PLATED TUBING



FIG. 2242

Positive grip, no lost motion, has no teeth, and will not mar the pipe or threads; will not slip on oily, galvanized or polished pipe.

Makes or breaks the tightest joint easily.

Can be operated in close quarters and where space between pipes is limited.

No.	1	2	3	4
Length .....inches	10	20	25	
Takes Pipe	$\frac{3}{8}$ to 1	1 to 2	2 to 3	3 and 4
Per Set	\$5.00	7.50	9.50	13.00
Wrench without Girths.....each	2.25	3.00	5.00	7.50

EXTRA GIRTHS

No.	1	2	3	4
Size .....inches	$\frac{3}{8}$ - $\frac{1}{2}$ - $\frac{3}{4}$ -1	1- $1\frac{1}{4}$	$1\frac{1}{2}$ -2	2- $2\frac{1}{2}$ -3
Each	\$0.75	1.00	1.25	1.50
				2.50
				3.00

Extra Pins, each, No. 1, \$0.20; No. 2, \$0.30; No. 3, \$0.35; No. 4, \$1.00.

LAY TONGS

Regular

Extra Heavy, Long Handles

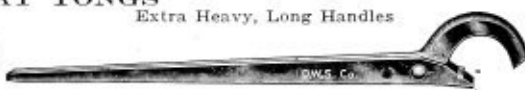


FIG. 2243

FIG. 2244

Size .....inches	2	$2\frac{1}{2}$	3	4	5
Weight .....pounds	24 to 34	25 to 35	30 to 48	54 to 60	55 to 75
Regular	\$ 6.50	7.50	9.00	12.00	13.25
Extra heavy, long handles, steel lined..	10.00	11.00	14.25	16.00	20.50
Size .....inches	6	8	10	12	
Weight .....lbs.	80 to 95	130 to 150	145 to 164	175 to 212	.....
Regular	\$18.50	34.50	39.00	46.00	.....
Extra heavy, long handles, steel lined..	25.00	44.00	50.00	60.00	.....

Bits, 2-inch to $2\frac{1}{2}$ -inch, inclusive.....each, \$0.17
 Bits, 3-inch to 6 -inch, inclusive.....each, .20
 Bits, 8-inch to 12 -inch, inclusive.....each, .25

Note: Sizes not listed above can be made to order and will take the list of the next larger size.

BEAVER SQUARE-END PIPE CUTTERS

FOR CUTTING PIPE RAPIDLY WITHOUT A BURR

Beaver Square-End Cutters actually cut the pipe—leaving a clean-cut square end. No burr outside—to obstruct and ruin threading dies; no burr inside—to reduce capacity of the pipe line from 6 to 50 per cent. A square end is obtained immediately—without reaming or filing. The knives feed automatically—and are set, ready to cut when cutter is placed on pipe. Knives will last hundreds of cuts—and can be resharpened on a grindstone.



FIG. 2245

Beaver Cutters are as simple as wheel "cutters" and more durable—an investment producing returns in good work, rapidly done, long after the ordinary kind have been scrapped.

NO. 1 BEAVER CUTTER— $\frac{1}{4}$ TO 1 INCH
NO. 5 BEAVER CUTTER— $\frac{1}{2}$ TO 2 INCH

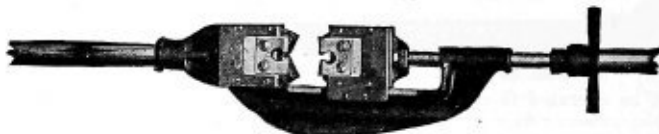


FIG. 2246

Nos. 1 and 5 Beaver Square-End Cutters are alike in design—simple, sturdy, one-piece tools. To operate, simply place cutter around the pipe, turn "T" handle until "V" jaws grip pipe. Then revolve cutter like a die stock. No feeding is necessary—as the knives are fed automatically by powerful springs which are compressed when cutter is centered on the pipe. Beaver Cutters work easier and quicker than wheel cutters or hack saws. Ideal for electric conduit work, as well as steam, gas and water pipe.

NO. 10— $2\frac{1}{2}$ TO 4 INCH

The No. 10 Beaver Square-End Pipe Cutter, $2\frac{1}{2}$ to 4 inch, is ratchet driven; can be used in ditch or at bench; is easily operated by one man. Frame can be "broken" and cutter placed around a running pipe line. The same cutting principle is employed in the No. 10 as in smaller tools, but the gripping jaws and knives are operated by separate centering screws. The No. 10 is entirely constructed of steel and malleable iron with all bearings bronze bushed.

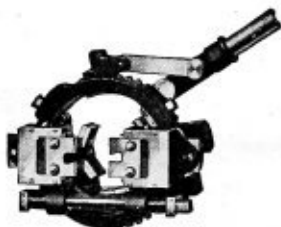


FIG. 2247

NO. 15 BEAVER CUTTER— $2\frac{1}{2}$ TO 6 INCH

The No. 15 Beaver Square-End Cutter, $2\frac{1}{2}$ to 6-inch, is a natural development of the successful No. 10. Four cutting knives are used instead of two, making it possible to cut 6-inch pipe as rapidly as the smaller sizes. The knives are fed automatically—no hand feeding necessary. Cuts pipe quickly and without burr. When necessary, the No. 15 can be "broken" and placed over a running pipe line.

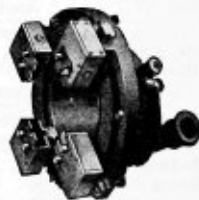


FIG. 2248

Number	1	5	10	15
Cuts Pipe	inches $\frac{1}{4}$ to 1	$\frac{1}{2}$ to 2	$2\frac{1}{2}$ to 4	$2\frac{1}{2}$ to 6
Price, Complete	each \$18.00	\$20.00	\$90.00	\$180.00
Price, Extra Knives	per set 1.20	1.50	2.50	5.00
Sharpening Knives (when sent to us)	per set 0.30	0.40	0.70	1.40

PIPE CUTTERS

BARNES Three-Wheel



FIG. 2249

SAUNDERS



FIG. 2250

BARNES THREE-WHEEL PIPE CUTTERS

Number	1	2	3	4	5	6	7
Cuts Pipe.....inches	$\frac{1}{8}$ to 1	$\frac{1}{2}$ to 2	$1\frac{1}{2}$ to 3	$2\frac{1}{2}$ to 4	4 to 6	6 to 8	9 to 12
Price	\$4.50	6.00	10.00	20.00	30.00	40.00	50.00
Ex. Wheels.....each	.25	.30	.40	.50	.75	.75	.75
Ex. Wheel Pins...each	.10	.10	.10	.20	.20	.20	.20

SAUNDERS PIPE CUTTERS

Number	1	2	3	4	5
Cuts Pipe.....inches	$\frac{1}{8}$ to 1	1 to 2	2 to 3	$2\frac{1}{2}$ to 4	4 to 6
Price	\$3.00	4.50	11.00	18.00	28.00
Price, Extra Wheels.....each	.24	.32	.60	.60	.60
Price, Extra Block and Wheel.....each	1.25	1.75	2.75	3.50	4.00
Price, Extra Rollers.....each	.24	.32	.50	.50	.60
Price, Extra Pins.....each	.10	.10	.15	.15	.15

TRIMO



FIG. 2251

HOLLANDS



FIG. 2252

TRIMO PIPE CUTTERS

Number	1	2	3
Cuts Pipe.....inches	$\frac{1}{8}$ to $1\frac{1}{4}$	$\frac{1}{2}$ to 2	$1\frac{1}{4}$ to 3
Price	\$4.50	6.00	10.00
Price Extra Wheels.....each	.30	.30	.40
Price Extra Rolls.....each	.30	.30	.40

HOLLANDS PIPE CUTTERS

No. 3-Wheel Type.....	1W	2W	3W	4W	5W
Cuts Pipe.....inches	$\frac{1}{8}$ to $1\frac{1}{4}$	$\frac{3}{8}$ to 2	1 to $3\frac{1}{2}$	1 to 4	4 to 6
Price	\$4.50	6.00	11.00	18.00	28.00
Extra Wheels	.25	.32	.60	.60	.60
Extra Pins	.10	.10	.15	.15	.15

No. Roller Type.....	1R	2R	3R	4R	5R
Cuts Pipe.....inches	$\frac{1}{8}$ to $1\frac{1}{4}$	$\frac{1}{2}$ to 2	$1\frac{1}{4}$ to 3	2 to 4	4 to 6
Price	\$4.50	6.00	11.00	18.00	28.00
Extra Pins	.10	.10	.15	.15	.15
Extra Rollers	.25	.32	.50	.50	.50

ARMSTRONG'S PIPE CUTTER



FIG. 2252A

No. 1.	Cutting from $\frac{1}{8}$ to $1\frac{1}{4}$ inch Pipe.	Price.....	each \$4.50
No. 2.	Cutting from $\frac{1}{2}$ to $2\frac{1}{2}$ inch Pipe.	Price.....	each 6.00
No. 3.	Cutting from $1\frac{1}{2}$ to 4 inch Pipe.	Price.....	each 15.00

NYE PIPE CUTTERS



FIG. 2253

No. 1	cuts $\frac{1}{8}$ to $1\frac{1}{4}$ inch pipe.	Price.....	each \$3.00
No. 2	cuts $\frac{1}{2}$ to 2 inch pipe.	Price.....	each 4.50

NYE KNURLED CUTTER WHEELS

Made to fit all standard makes of pipe cutters, such as the Nye, Barnes, Saunders and Trimo.

In use the knurled cutter wheels act like a saw, they do not simply spread the metal apart as ordinary cutter wheels do, but they make a square, clean cut and do their work easier than any other cutter wheels. They are made of Tungsten Alloy tool steel, hardened and tempered in oil.



FIG. 2254

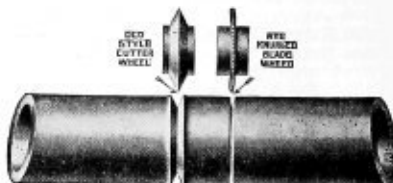


FIG. 2255

No. 1 Barnes	each \$0.50	No. 1 Saunders	each \$0.50	No. 1 Nye	each \$0.70
No. 2 Barnes	each .60	No. 2 Saunders	each .60	No. 2 Nye	each .80
No. 3 Barnes	each .80	No. 3 Saunders	each 1.10	No. 1 Trimo	..each .60
No. 4 Barnes	each 1.00	No. 4 Saunders	each 1.10	No. 2 Trimo	..each .60
No. 5 Barnes	each 1.10	No. 5 Saunders	each 1.10	No. 3 Trimo	..each .90

HALL'S CAST IRON PIPE CUTTER

Cuts to exact measure—No occasion for hammer and chisel—Makes a clean, even cut—Pipe can be cut in the trench.

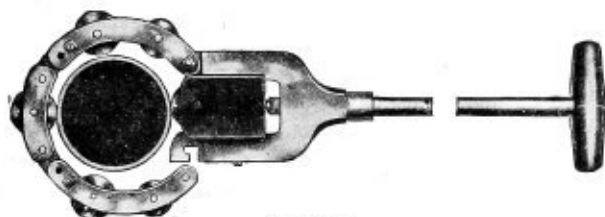


FIG. 2256

Time required for cutting 4-inch, 6-inch or 8-inch pipe, not more than four minutes.

No. 1 cuts 4, 6 and 8 inch pipe.....	price	\$25.00
Extra Loops, with Wheels.....	\$7.00	Block with Wheel.....\$0.95
Wheels	.23	Spindle with Handle......70
Extra Bolts for Loops, \$0.12.		

THE D. S. S. TOOL CUTTER

For cutting brass, copper and iron tube for boilers, etc.



FIG. 2257

The only practical Tool Cutter in the market. Similar in action to that of a Lathe Tool, cutting chips out and leaving the end of the pipe perfectly square. Can cut off $\frac{1}{8}$ or longer piece. All the wearing surfaces—rollers, pins, tools and tool rest—are made of the best tool steel, and hardened, thus increasing the durability and lessening the friction to the least possible amount.

CUTTERS COMPLETE

No. 1 cuts $\frac{3}{8}$ inch to $1\frac{1}{4}$ inch..	\$ 6.50
No. 2 cuts $1\frac{1}{4}$ inch to $2\frac{1}{4}$ inch..	8.00
No. 3 cuts $2\frac{1}{4}$ inch to $3\frac{1}{2}$ inch..	16.00
No. 4 cuts 3 inch to $4\frac{1}{2}$ inch..	25.00

EXTRA PLAIN ROLLERS

No. 1	\$0.24
No. 2	.32
No. 3	.50
No. 4	.75

EXTRA TOOLS

No. 1	\$0.18
No. 2	.25
No. 3	.35
No. 4	.45

EXTRA BLOCKS AND ROLLERS

No. 1	\$1.25
No. 2	1.75
No. 3	3.25
No. 4	4.25

EXTRA BEAD ROLLERS

No. 1	\$0.40
No. 2	.60
No. 3	1.00
No. 4	1.25

EXTRA PINS

No. 1	\$0.10
No. 2	.12
No. 3	.15
No. 4	.15

REX HANDY PIPE BENDERS

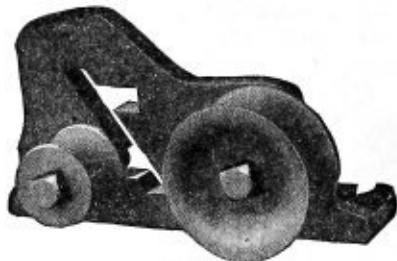


FIG. 2258

Bends pipe without flattening or kinking. Adjustable to all angles for all curves.

A very handy tool for the shop. Can be adjusted for any angle. Easily attached to bench or used in vise. Suitable for all sizes from $\frac{1}{8}$ in. to 2 in. pipe. Well constructed. A useful tool for all pipe fitters.

- | | |
|---|--------------|
| No. 1. Bends pipe from $\frac{1}{8}$ in. to $1\frac{1}{4}$ in., wt. 17 lbs. | each \$ 6.50 |
| No. 2. Bends pipe from $1\frac{1}{4}$ in. to 2 in., wt. 50 lbs. | each 12.00 |
| No. 3. Bends pipe from $\frac{1}{8}$ in. to $1\frac{1}{4}$ in., wt. 20 lbs. | each 6.50 |

No. 3 is for wall use.

SELF ADJUSTING BENDER NO. 10



FIG. 2259

Showing Use
on the Floor

Showing Use with Bench Vise



FIG. 2260

Especially designed for bending conduit pipe and rods. The disk assures perfect bending. The swivel handle makes it convenient to bend pipe in close quarters. A handy tool for the kit.

- | | |
|---|-------------|
| No. 10. Bends pipe from $\frac{1}{8}$ in. to 1 in.; weight, 11 lbs. | each \$7.00 |
|---|-------------|

MOSSBERG UNIVERSAL AUTOMOBILE VALVE SPRING LIFTER NO. 655



FIG. 2261

Valves must be ground—valve springs must be lifted—and the ease and speed with which these springs are adjusted determine just how much work can be done in the quickest possible time.

No. 655 goes under the spring washer readily, raises with slight pressure of the fingers, and "stays put" where you wish it

because the ratchet locks it in position.

- | | |
|---|-------------|
| No. 655 Mossberg Improved Universal Valve Spring Lifter | each \$1.00 |
|---|-------------|

MACHINE OR SOLID BOLT DIES



FIG. 2262

All orders for solid bolt dies will be filled with U. S. S. threads unless otherwise specified.

Dies $\frac{1}{4}$ inch over size, $\frac{1}{4}$ to $\frac{5}{8}$ inch, inclusive, and $\frac{1}{2}$ inch over size, $\frac{1}{4}$ to 2 inches, inclusive, furnished at regular prices.

Left hand dies are special and prices will be quoted on application.

Cutting Size, Inches	No. Threads Per Inch, U. S. S.	Size of Square, Inches	Thickness, Inches	Price, Each
$\frac{1}{4}$	20	$2\frac{1}{2}$	$\frac{1}{2}$	\$1.80
$\frac{3}{8}$	18	$2\frac{1}{2}$	$\frac{1}{2}$	1.80
$\frac{1}{2}$	16	$2\frac{1}{2}$	$\frac{1}{2}$	1.80
$\frac{3}{4}$	14	$2\frac{1}{2}$	$\frac{1}{2}$	1.80
$\frac{1}{2}$	13	$2\frac{1}{2}$	$\frac{3}{4}$	1.80
$\frac{3}{4}$	12	$2\frac{1}{2}$	$\frac{3}{4}$	1.90
$\frac{1}{2}$	11	$2\frac{1}{2}$	$\frac{3}{4}$	2.00
$\frac{3}{4}$	11	$2\frac{1}{2}$	$\frac{3}{4}$	2.10
$\frac{1}{2}$	10	$2\frac{1}{2}$	$\frac{3}{4}$	2.20
$\frac{3}{4}$	10	$2\frac{1}{2}$	$\frac{3}{4}$	2.30
$\frac{1}{2}$	9	$2\frac{1}{2}$	$\frac{3}{4}$	2.40
$\frac{3}{4}$	9	$2\frac{1}{2}$	$\frac{3}{4}$	2.55
1	8	$2\frac{1}{2}$	1	2.70
$1\frac{1}{8}$	7	$2\frac{1}{2}$	1	3.00
$1\frac{1}{4}$	7	$2\frac{1}{2}$	1	3.30
$1\frac{3}{8}$	6	$2\frac{1}{2}$	1	3.60
$1\frac{1}{2}$	6	3	1	3.90
$1\frac{5}{8}$	$5\frac{1}{2}$	3	1	4.20
$1\frac{3}{4}$	5	3	$1\frac{1}{4}$	5.40
$1\frac{7}{8}$	5	$3\frac{1}{2}$	$1\frac{1}{2}$	6.50
2	$4\frac{1}{2}$	$3\frac{3}{4}$	2	7.50



FIG. 2263

SOLID PIPE DIES

BRIGGS STANDARD

Pipe dies are furnished either right or left hand at same prices.

Cutting Size Pipe, Inches	Outside Dimensions, Inches	Price, Each
$\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$	2 x2 x $\frac{1}{2}$	\$1.50
$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1	$2\frac{3}{8}$ x $2\frac{3}{8}$ x $\frac{3}{4}$	2.00
$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1	$2\frac{1}{2}$ x $2\frac{1}{2}$ x $\frac{3}{4}$	2.00
$\frac{3}{4}$, 1, $1\frac{1}{4}$	$2\frac{7}{8}$ x $2\frac{7}{8}$ x $\frac{3}{4}$	2.50
$\frac{3}{4}$, 1, $1\frac{1}{4}$	3 x3 x $\frac{3}{4}$	2.50
$1\frac{1}{4}$, $1\frac{1}{2}$, 2	$3\frac{7}{8}$ x $3\frac{7}{8}$ x $\frac{7}{8}$	3.50
$1\frac{1}{4}$, $1\frac{1}{2}$, 2	$3\frac{7}{8}$ x $3\frac{7}{8}$ x 1	3.50
$1\frac{1}{4}$, $1\frac{1}{2}$, 2	4 x4 x $\frac{7}{8}$	3.50
$1\frac{1}{4}$, $1\frac{1}{2}$, 2	4 x4 x 1	2.50
$2\frac{1}{2}$, 3	5 x5 x $1\frac{1}{4}$	9.00

NYE "SKIP TOOTH" PIPE DIES



FIG. 2264

One of the last added and most important improvements in the Nye Die is the newly invented rounded bottom "skip tooth" feature. Previously the teeth which were removed in the Nye Die to form the "skip tooth" feature were cut out squarely at the base or the root line of the chaser, but some little difficulty was found in the breakage of the remaining teeth. It was discovered by experimenting that the square corners at the base of the teeth after being hardened were under a strain.

Toolmakers know by experience that a square corner must be avoided in any hardened or tempered tool,

and according to this law the Nye "skip tooth" feature has now been perfected by rounding out the bottom of the "skip tooth." These rounded bottoms are extended below the root line of the chaser, and they are exactly the same construction as that adopted in all circular saws. The results are twofold:

First: The intercepted teeth are much stronger than the ordinary type of die and, in fact, are stronger than the front teeth in the same die.

Chips Produced With Nye Chasers



ting with a lathe tool—the best results are obtained only by cutting the metal out smooth. This will result in long, curling, continuous ribbons of metal. If the metal is removed in small chips or "chunks," the operator of a lathe immediately knows he has not set his tool at the proper angle. The chips produced by the ordinary die are simply small crumbs of metal, whereas the chips produced by the Improved Nye Die are long curling ribbons of metal, as shown in the illustration.

Cutting Size.....inches	$\frac{1}{8}$	$\frac{1}{4}$ - $\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, $2\frac{1}{2}$, for No. 0 Stock.....each	2.00	2.50	3.00	.....	.....	.....	.....	.....	.....	.....
Price, $2\frac{1}{2}$ to $3\frac{1}{4}$, for No. 1 Stock each	2.00	2.50	3.00	3.00	3.50	.....	.....	.....	.....	.....
Price, $3\frac{1}{4}$, for Nos. $1\frac{1}{2}$ and $1\frac{3}{4}$ Stocks.....each	2.50	3.00	3.50	3.50	4.00	4.00	4.50	.....	.....	.....
Price, $4\frac{1}{4}$, for No. 2 Stock.....each	.....	.....	4.00	4.00	4.50	4.50	5.00	5.00	.....	.....
Price, $5\frac{1}{4}$, for Nos. 3 & 4 Stks., ea.	.....	.....	.....	.....	.....	.....	.....	.....	13.00	14.00

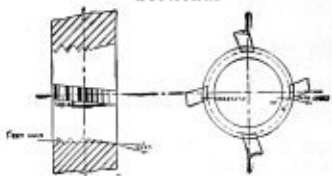
NYE ADJUSTABLE DIES

FOR ARMSTRONG OR ARMSTRONG PATTERN STOCKS

Cutting Size.....inches	$\frac{1}{8}$ to $\frac{1}{2}$	$\frac{1}{8}$ to 1	$\frac{1}{2}$ to $1\frac{1}{4}$	$1\frac{1}{2}$ to $3\frac{1}{4}$
For Stock.....number	1	2	2	2
Price.....each	3.50	3.50	5.00	5.00
Cutting Size.....inches	$1\frac{1}{2}$ to 2	$2\frac{1}{2}$ to 3	$3\frac{1}{2}$ to 4	$4\frac{1}{2}$ to 5
For Stock.....number	2	3	6	7
Price.....each	5.00	5.00	25.00	35.00

*Double end.

Sectional



Secondly: This feature allows far greater clearance for the escape of chips and oil than can possibly be found in any other construction.

In the Improved Nye Die the chasers are cast into a block of metal, and the angle of rake is controlled by the core boxes which are made absolutely true.

In threading pipe with a die the same condition prevails as in cut-



FIG. 2265

GENUINE ARMSTRONG STOCK AND DIES FOR THREADING PIPE



FIG. 2266

No.	Sizes	List
1	Stock, 4 R. H. Pipe Dies, $\frac{1}{8}$ to $\frac{1}{2}$ inch....	\$ 9.00
1	Stock, 4 each R. H. and L. H. Pipe Dies, $\frac{1}{8}$ to $\frac{1}{2}$ inch.....	14.00
2	Stock, 5 R. H. Pipe Dies, $\frac{1}{4}$ to 1 inch.....	12.00
2	Stock, 6 R. H. Pipe Dies, $\frac{1}{8}$ to 1 inch.....	14.00
2	Stock, 5 each R. H. and L. H. Pipe Dies, $\frac{1}{4}$ to 1 inch.....	20.00
2	Stock, 6 each R. H. and L. H. Pipe Dies, $\frac{1}{8}$ to 1 inch.....	22.00
2½	Stock, 4 R. H. Pipe Dies, $\frac{1}{2}$ to 1½ inch....	14.00
2½	Stock, 4 each R. H. and L. H. Pipe Dies, $\frac{1}{2}$ to 1½ inch.....	21.00
3	Stock, 3 R. H. Pipe Dies, 1¼ to 2 inch.....	18.00
3	Stock, 4 R. H. Pipe Dies, 1 to 2 inch.....	21.00
3	Stock, 5 R. H. Pipe Dies, $\frac{3}{4}$ to 2 inch.....	24.00
3	Stock, 3 each R. H. and L. H. Pipe Dies, 1¼ to 2 inch.....	30.00
3	Stock, 4 each, R. H. and L. H. Pipe Dies, 1 to 2 inch.....	37.00
3	Stock, 5 each R. H. and L. H. Pipe dies, $\frac{3}{4}$ to 2 inch.....	44.00

The numbers 1, 2, and 3 sets have two handles and single end dies. The number 2½ sets have 2 handles and double ended dies $\frac{1}{2}$ and $\frac{3}{4}$. 1 and 1½ single ended, $\frac{1}{4}$ inch and single ended $\frac{3}{8}$ inch dies can be had for this set. The numbers 6 and 7 sets have 4 handles, double ended dies and leader screws.

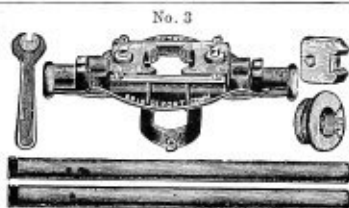


FIG. 2267

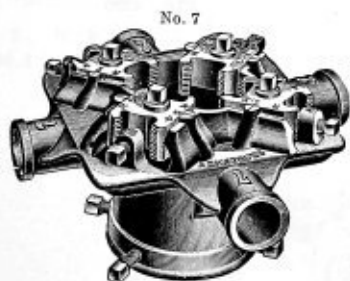


FIG. 2268

No.	Size	List
6	Stock Cutting 2½, 3, right.....	\$45.00
6	Stock Cutting 2½, 3, right and left..	60.00
7	Stock Cutting 2½ to 4 right.....	75.00
7	Stock Cutting 2½, 3, right.....	55.00
7	Stock Cutting 3½, 4, right.....	55.00
7	Stock Cutting 2½ to 4, right and left	110.00
7	Stock Cutting 2½, 3, left.....	55.00
7	Stock Cutting 3½, 4, left.....	55.00

Numbers	1	2	2½	3	6	7
Stocks	\$3.25	\$4.00	\$5.25	\$7.00	\$25.00	\$30.00
Dies	1.60	2.00	3.50	4.50	17.00	20.00
Bushings	.30	.40	.60	.75	2.00	3.00
Wrenches	.20	.25	.25	.30	.30	.30
Collar Screws	.25	.30	.35	.50	.50	.50
Adjusting Screws	.20	.25	.35	.40	.40	.40
Thumb Screws	.20	.30	.30	.50	.....	.....

THE BARD ADJUSTABLE BUSHING

This Bushing is fitted with hardened jaws which are moved to and from center by means of a cam plate, and, by fastening the plate with the thumb screw, the jaws are firmly held in any desired position.



FIG. 2269

The adjustable jaws make a perfect center for the pipe, fit closely around the pipe and insure the cutting of a straight thread. When necessary a crooked or drunken thread can be cut with this bushing as easily as with a ring bushing.

When once attached to the die stock it can always remain there. It does away with the necessity of carrying a number of loose ring bushings, and saves the time now lost in hunting for and changing the bushing for each size of pipe.

No more winding tin or paper around pipe.

This bushing only furnished with genuine Armstrong Stocks.

Number	1	2	2½	3
Fitting Die Stock Threading for.....	½ down	1 down	1¼ down	2 down
List Price	each \$4.50	5.00	6.00	8.00

ARMSTRONG RATCHET ATTACHMENT

The Improved Ratchet Attachment is so constructed that all the energy required to operate it is close to the center. Can be used either right or left. With this attachment any Armstrong Stock becomes a ratchet stock and die.



FIG. 2270

Number	2	2½	3	6	7
Price	each \$2.50	3.00	3.50	5.00	5.00

ARMSTRONG'S ADJUSTABLE STOCK

FITTED WITH BARD ADJUSTABLE BUSHINGS



FIG. 2271

Number	1	2	2	2	2½	3	3	3
Number Dies	4 R.H.	5 R.H.	6 R.H.	5 R.H.	4 R.H.	3 R.H.	4 R.H.	5 R.H.
Size Dies	in. ¼ to ½	¼ to 1	¼ to 1	½ to 1¼	½ to 1¼	1¼ to 2	1 to 2	¾ to 2
Price	\$12.00	15.50	17.50	18.50	18.20	23.70	25.70	28.70

REED MALLEABLE STOCKS WITH Q. & E. PIPE DIES

Stock Nos. 0SP, 1SP and 1½SP.



FIG. 2272

Die



FIG. 2373

Set No.	Threads Pipe, Inches	Outside Dimensions of Dies	List Price of Set	Full List of Dies Made	List Extra Dies	List Extra Guides	List Die Frames
0 SP1	1/8 to 1/2	2 x2 x 1/2	\$ 8.00	1/8 to 1/2	\$1.40	\$0.30	\$....
1 SP1	1/4 to 1	2 1/2 x2 1/2 x 3/4	10.50	1/4 to 1	1.60	.40	.30
1 SP2	1/8 to 1	2 1/2 x2 1/2 x 3/4	12.00	1/8 to 1	1.60	.40	.30
1 SP3	1/8 to 3/4	2 1/2 x2 1/2 x 3/4	10.50	1/8 to 1	1.60	.40	.30
1 1/2 SP1	3/8 to 1 1/4	3 x3 x 3/4	9.50	1/8 to 1 1/2	2.00	.60	.40
1 1/2 SP2	1 to 1 1/2	3 x3 x 3/4	9.50	1/8 to 1 1/2	2.00	.60	.40
1 1/2 SP3	3/4 to 1 1/4	3 x3 x 3/4	15.50	1/8 to 1 1/2	2.00	.60	.40
1 1/2 SP4	1/8 to 1 1/2	3 x3 x 3/4	19.50	1/8 to 1 1/2	2.00	.60	.40
2 SP1	1 1/4 to 2	4 x4 x 7/8	14.50	1/8 to 2	2.50	.75	*.50
2 SP2	1 to 2	4 x4 x 7/8	17.00	1/8 to 2	2.50	.75	*.50
2 SP3	3/4 to 2	4 x4 x 7/8	19.50	1/8 to 2	2.50	.75	†.80
2 SP4	1/2 to 2	4 x4 x 7/8	22.00	1/8 to 2	2.50	.75	†.80
3 SP1	2 1/2 and 3	5 x5 x1 1/4	35.00	1 1/2 to 3	9.00	2.00	.60
4 SP1	2 1/2 and 3	5 x5 x1 1/4	42.00	1 1/2 to 3	9.00	2.00	.60

*List on Die Frames Nos. 2SP to 1 1/2SP. †List on Die Frames Nos. 2SP to 1SP.

Sets Nos. 2SP, 3SP, and 4SP have Lead Screws. Set No. 4SP has four handles.

Left hand sets and dies can be furnished, but right hand sets and dies will be furnished unless otherwise specified.

Q & E dies are high grade steel and guaranteed.

MILLER'S REVERSIBLE RATCHET STOCKS

Nos. C, D & E



FIG. 2374

No. B



FIG. 2375

Number	Threads Pipe, Inches	Dimen- sions of Dies, In.	Price Complete, Each	Price Stocks Only, Ea.	Price Extra Dies, Ea.	Price Ex- tra Bush- ings, Each	Extra Die Frames, Each
B	1/4 to 1	2 1/2 x 3/4	\$15.00	\$ 7.50	\$1.50	\$0.25	\$0.22
C	1 to 1 1/2	3 x 3/4	18.50	13.00	1.80	.35	.30
D	1 1/4 to 2	4 x 7/8	20.00	12.50	2.50	.45	.38
E	2 1/2 and 3	5 x1 1/4	44.50	29.00	7.75	.85	.45

Numbers C, D and E have Leader Screw.

TRIO DIE STOCKS FOR THREADING PIPE



FIG. 2276

Simple, Compact and Complete. In three words the Trio Die Stock is described.

No parts to lose. No screws to be broken. No cam plates to adjust.

The Trio Die Stock is furnished with ring guides.

The Duo Die Stocks are similar to the Trio Die Stocks except that each set holds two sizes of Little Giant Pipe Dies instead of three.

All the sizes that are needed are in the stock all the time. Impossible to forget dies or bushings.

TRIO DIE STOCKS WITH BUSHING GUIDES FOR THREADING PIPE



FIG. 2277

Regularly furnished with one stock, three Little Giant Pipe Dies and three bushings.

Briggs Standard right hand threads furnished unless otherwise specified.

No.	Price, Each	Cutting Sizes	Weight, Lbs.	Length Stock, Inches
200A	\$ 8.50	$\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$ in.	$4\frac{1}{2}$	28
200B	8.50	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$ in.	$4\frac{1}{2}$	28
210A	11.00	$\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$ in.	10	40
210B	11.00	$\frac{1}{2}$, $\frac{3}{4}$, 1 in.	10	40

DUO DIE STOCKS WITH BUSHING GUIDES FOR THREADING PIPE



FIG. 2278

In design, construction and workmanship, this stock is similar to the TRIO, except that it holds two sizes of Little Giant Pipe Dies, instead of three.

No.	Price, Each	Cutting Sizes	Weight, Lbs.	Length Stock, Inches
220A	\$ 8.50	$\frac{1}{2}$, $\frac{3}{4}$ in.	$7\frac{1}{2}$	26
220B	8.50	$\frac{3}{4}$, 1 in.	$7\frac{1}{2}$	26
230	12.00	1, $1\frac{1}{4}$ in.	17	37
240A	15.00	$1\frac{1}{4}$, $1\frac{1}{2}$ in.	18	37
240B	15.00	$1\frac{1}{2}$, 2 in.	20	37

BEAVER EASY-WORKING DIE STOCKS**NO. 3 BEAVER JR.— $\frac{1}{8}$ TO 1 INCH**

The No. 3 Beaver Jr. is extremely simple and effective—consisting only of one ratchet handle and individual die heads from $\frac{1}{8}$ to 1-inch, as desired.

It can be operated close to walls or rafters, in corners, against ceilings and in all places where space is limited.

The Beaver Jr. is superior to other similar tools as the ratchet mechanism is entirely encased, where grease and dirt cannot reach it.

The Beaver Jr. can be bought complete, (in a wooden box) or in separate units, (packed in cardboard containers.)

**FIG. 2279**

Separate heads can be furnished to cut left hand threads.

Beaver Jr. Complete, in wood box.....	$\frac{1}{8}$ to 1-inch	\$24.00
Ratchet Handle	only	4.00
Die Heads	1-inch	4.00
Die Heads	$\frac{3}{4}$ or $\frac{1}{2}$ -inch	3.50
Die Heads	$\frac{3}{8}$, $\frac{1}{4}$ or $\frac{1}{8}$ -inch	3.00
Extra Dies (4 chasers).....	(Any size)	2.50

NO. 6 BEAVERETTE— $\frac{1}{4}$ TO $\frac{3}{4}$ INCH**FIG. 2280**

This remarkable little die stock has proven its popularity by constantly increasing sales in the 10 years it has been on the market. It is the only tool manufactured threading $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$ and $\frac{3}{4}$ without changing dies or bushings. The two sets of dies necessary to cover this range are operated by one handle; simply set to size required and the thread may be cut in less time than it takes to change dies in other tools. Left-hand dies or extra $\frac{1}{8}$ -inch die can be substituted when required.

Name	Threads	Net Weight	List Price
No. 6 Beaverette.....	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$	\$ lbs.	\$15.00
Extra Dies (right or left):.....	($\frac{1}{8}$) ($\frac{1}{4} \times \frac{3}{8}$) or ($\frac{1}{2} \times \frac{3}{4}$)	per set	3.00

NO. 210 BEAVER CROSS BAR— $\frac{1}{2}$ TO 1 $\frac{1}{4}$ INCH

An easy cutting die stock built on a new principle. The dies are expanded to cut a regular tapered thread by contact with the end of the pipe. The lower section of the dies does the rough work of starting, thus reducing the wear on the upper receding part of die. Automatically thrown out when thread is finished.

**FIG. 2281**

Name	Threads	List Price
Threads Pipe	inches $\frac{1}{2}$ to 1 $\frac{1}{4}$	
Price, Complete with Double-ended Dies.....	each	\$20.00
Price, Extra Dies, $\frac{1}{2} \times \frac{3}{4}$ and 1x1 $\frac{1}{4}$ -inch Double-ended, R. or L.....	per set	5.00
Price, Extra Dies, $\frac{1}{4} \times \frac{3}{8}$ and $\frac{1}{2} \times \frac{3}{4}$ -inch Double-ended, R. or L.....	per set	5.00
Price, Extra Dies, $\frac{1}{2} \times \frac{3}{4}$ -inch Single-ended, R. or L.....	per set	3.50
Price, Extra Dies, 1x1 $\frac{1}{4}$ -inch Single-ended, R. or L.....	per set	3.50
Price, Extra Dies, $\frac{1}{4} \times \frac{3}{8}$ -inch Single-ended, R. or L.....	per set	3.50

BEAVER EASY-WORKING DIE STOCKS

SIZES 1 TO 2 INCH

Beaver Nos. 25 and 26 are alike, except that No. 26 has ratchet attachment.

These tools operate on the Beaver receding-die principle, using thin dies that expand to cut the standard tapered thread. The further you thread, the easier the labor—a man of ordinary strength can cut a 2-inch thread with one hand.

NO. 25 BEAVER—1 TO 2 INCH PLAIN



FIG. 2282

Both these tools thread 1, 1¼, 1½ and 2-inch pipe—without changing dies or bushings. One set of dies cuts all sizes and is adjustable to cut standard, oversize or undersize threads. Running threads, pitched threads, and nipples can be cut. With Beavers you can cut a thread in the time it takes to change dies in other tools.

The centering chuck eliminates the bother of four separate bushings. It centers the pipe accurately, assuring straight threads, and is simple and stronger than ordinary grip screws.

When new dies are needed, you buy one set instead of four. Dies are made of Vanadium steel and can be resharpened on an ordinary grindstone.

NO. 26 BEAVER—1 TO 2 INCH RATCHET

The No. 26 is a universal tool, and is preferred by many careful buyers, because it can be used in ditches, corners, against walls, etc., as well as at the bench.

Both the No. 25 and No. 26 can be furnished to thread left-hand only, when required.

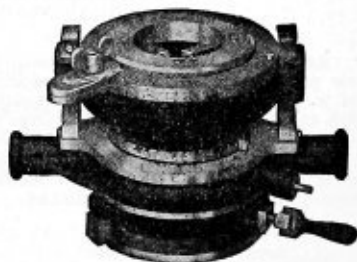


FIG. 2283

Name	Threads	Net Weight	List Price
No. 25 Plain	1, 1¼, 1½, 2-inch	22	\$30.00
No. 26 Ratchet.....	1, 1¼, 1½, 2-inch	27	35.00
Extra Dies	(1, 1¼, 1½, 2-inch)	per set	3.50

BEAVER EASY-WORKING DIE STOCKS

SIZES 2½ TO 12 INCH

No. 41

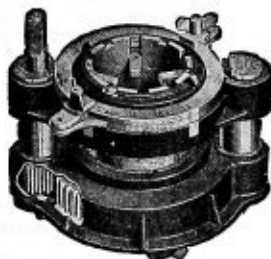


FIG. 2284

No. 61



FIG. 2285

NO. 41

Threads all sizes—2½, 3, 3½ and 4-inch—or variations from standard without changing dies. The gears are cut steel and in addition are covered, which protects tool and operator. Threads are easily cut on the pipe in a ditch as well as at the bench. Has bushings and grip screws. A boy can thread 4-inch pipe. The tool is fast. There are no dies to look for—they are all in the tool.

Threads Pipe	inches	2½ to 4
Shipping Weight	pounds	100
Price, Complete	each	\$110.00
Price, Extra Dies, Right-hand	per set	9.00

NO. 61

No. 61 is of similar construction to the No. 41, except two sets of dies are used to cover the unusually large range. One set cuts 2½, 3 and 3½-inch and the other set cuts 4, 4½, 5 and 6-inch. No tool required to change the dies. One man cuts any size in its range.

Threads Pipe	inches	2½ to 6
Shipping Weight	pounds	200
Price, Complete	each	\$220.00
Price, Extra Dies, Right-Hand (2½ to 3½) or (4 to 6)	per set	14.00

NOS. 80 AND 90

Nos. 80 and 90 are constructed the same as Nos. 41 and 61 and use two sets of dies. One man can cut largest size with either tool. The dies are made with wings which hold them rigidly without interfering with the adjustment. The main body of the tool is steel—all parts made interchangeable—meaning a minimum cost in case of accidents. All bearings are bronze bushed.

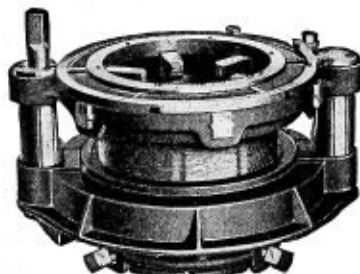


FIG. 2286

Number	80	90
Threads Pipe	4½ to 8	9 to 12
Shipping Weight	230	300
Price, Complete	\$300.00	\$500.00
Price, Extra Dies (Two Sets required)	20.00	30.00

TOLEDO ADJUSTABLE PIPE THREADING DEVICES

No. 00



FIG. 2287

No. 00 is an exceedingly efficient $\frac{1}{8}$ " to $\frac{3}{4}$ " ratchet threader. A separate die head for each size pipe, and instantly changed by pulling the pawl knob. Furnished complete with five die heads, ratchet and oak case.

No. 0 cuts $\frac{1}{2}$ " and $\frac{3}{4}$ " threads with one set of dies; $\frac{1}{4}$ " and $\frac{3}{8}$ " threads with another, and $\frac{1}{8}$ " threads with a third set. Uses the receding die principle for threading $\frac{1}{2}$ " and $\frac{3}{4}$ " pipe, thus making it the easiest operating tool in existence for these sizes. Very light and compact.

No. 0



FIG. 2288

No. 1



FIG. 2289

No. 1 is, and has been for a number of years, the most popular threading device in existence. It threads 1", 1 $\frac{1}{4}$ ", 1 $\frac{1}{2}$ " and 2" pipe. It is made both as a right-hand and a left-hand tool—neither will do both. It is perfectly easy for one man to cut 2" threads with it.

No. 1A is like the No. 1, except that it is equipped with a ratchet. It may be used with two handles as an ordinary die-stock or with one handle and the ratchet. Desirable for threading pipe in a trench and other restricted places. Made both as a right-hand and a left-hand tool—neither will do both.

No. 1A

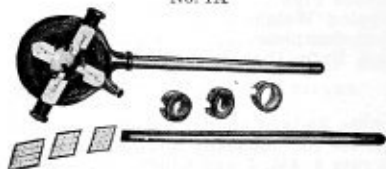


FIG. 2290

Number.....	00	0	*1	*1A
Threads Pipe..... inches	$\frac{1}{8}$ to $\frac{3}{4}$	$\frac{1}{8}$ to $\frac{3}{4}$	1 to 2	1 to 2
Net Weight..... pounds	10	7	18	22
Price, Complete..... each	\$20.00	\$16.00	\$24.00	\$30.00
Price, Dies, Set Four Segments... per set	2.00	2.50	2.50	2.50

List price for No. 1 and No. 1A Left-hand Tools same as for respective right-hand models.

TOLEDO ADJUSTABLE PIPE THREADING MACHINES

No. 10



FIG. 2291

No. 1½R



FIG. 2292

No. 10 is a "one set of dies" tool that threads 1" to 2", inclusive. Has no cams or other intricate mechanism for adjusting dies. Is simple and exceedingly easy to operate. No. 10A is like the No. 10, except that it is equipped with ratchet.

No. 1½R threads 2½" and 3" pipe. It operates with a ratchet only, and for a direct-acting tool threads pipe very easily.

No. 3

No. 2



FIG. 2293

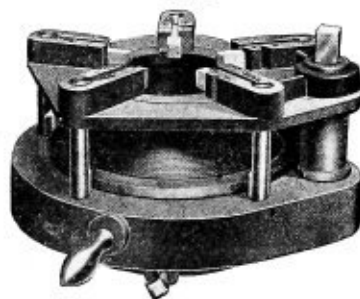


FIG. 2294

No. 2 is a remarkable tool, one man (or a boy) can thread 2½", 3", 3½" or 4" pipe with it. There is no other tool of its capacity that can be compared with it for ease of operation or general satisfaction.

No. 3 threads 4½" to 8" pipe so easily one man can readily do it. It is strictly portable, and with clearance in other directions, may be operated on a pipe, the center of which is within 10 inches of a wall or other obstruction.

Number.....	10	*10A	1½R	2	3	4	25
Threads Pipe.....inches	1 to 2	1 to 2	2½ to 3	2½ to 4	4½ to 8	9, 10, 12	2½ to 6
Net Weight.....pounds	16½	22	38	88	217	225	125
Price, Complete.....each	\$28.00	\$34.00	\$50.00	\$100.00	\$300.00	\$500.00	\$230.00
Price, Dies, Single Set...each	2.75	2.75	4.00	8.00	12.00	20.00	8.00
Price, Dies, Complete Set.	2.75	2.75	8.00	32.00	60.00	60.00	8.00

*No. 10A like No. 10, but equipped with ratchet.

HART'S "BUCKEYE" PIPE DIE STOCKS

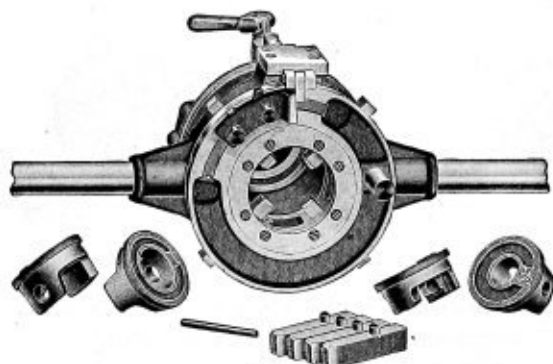


FIG. 2295

The several distinctive features of these tools are best mentioned in detail.

Dies.—These are made to cut easily by being formed with a short cutting edge and by the automatically expanding movement which they have as they are screwed onto the pipe, and which renders it possible, with such short edges, to produce threads having the taper essential for making tight joints. These cutting edges are furthermore made so as

to induce the dies to do their work without the aid of a leader screw. The remarkably small amount of power needed for such dies is explained mostly by the reduction of the friction generated in the case of dies with cutting edges of the usual length.

Adjustability of Dies.—The dies, themselves, and the stock are so constructed that a wide range of diameters is covered by one set of dies, a single set being used for 1, 1½, 1¾ and 2 inch pipe, for instance, thus avoiding changes and the care of additional parts.

Automatic Release of Dies.—As soon as the dies have been screwed onto the pipe far enough to complete a thread, they stop cutting and release themselves, permitting the immediate removal of a tool from its work.

Die Leading Device.—Instead of a leader screw, ordinarily used with the narrow, expanding style of dies, there is a leader ring which automatically causes the dies to start without any hand pressure, and through its employment the thread cutting that a tool is capable of doing, is not limited simply to threads of the same number to the inch, as are on a leader screw, nor to one direction of lead, making it possible to also thread either right or left handed. There is no reversing of the dies to be done with this device, nor screwing apart of pieces. Its life is many times greater than that of a leader screw.

The Nos. 25, 26 and 26½ are provided with gears which, with the aid of a ratchet wrench, enable all of the work to be done by one man, the same as with the smaller sizes.

Nos. 24, 28 and 28½ are of a ratchet pattern, especially adapted to work in close quarters.

No.	For Threading	Sets of Dies	Without Cut-Off	With Cut-Off
23	1, 1¼, 1½, 2	Pipe..... 1	\$ 30.00	\$ 35.00
23½	½, ¾, 1, 1¼, 1½, 2	"..... 2	35.00	40.00
24	1½, 2, 2½, 3	"..... 1	80.00	88.00
25	2½, 3, 3½, 4	"..... 1	115.00	125.00
26	4½, 5, 6	"..... 1	220.00	235.00
26½	2½, 3, 3½, 4, 4½, 5, 6	"..... 2	240.00	255.00
28	1, 1¼, 1½, 2	"..... 1	36.00	41.00
28½	½, ¾, 1, 1¼, 1½, 2	"..... 2	41.00	46.00

Extra dies per single set (4 pieces) right or left hand.

Nos. 23, 23½, 28 and 28½.....	\$5.50
Nos. 24 and 25.....	9.00
Nos. 26 and 26½ (6 pieces).....	16.00

HART'S "DUPLEX" PIPE DIE STOCKS

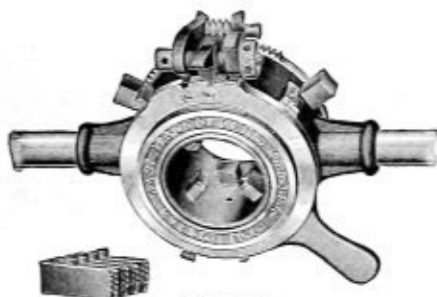


FIG. 2296

NOS. 51 TO 52½ DOUBLE ENDED DIES

No.	For Threading	Without Cut-off	With Cut-off
51	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$ Pipe.....	\$12.00	\$15.00
51½	$\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$ ".....	14.00	17.00
52	$\frac{1}{2}$, $\frac{3}{4}$, 1, 1½ ".....	15.50	18.50
52½	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, 1½ ".....	17.00	20.00

Extra dies per single set (4 pieces).

Nos. 51 and 51½—Single ended for $\frac{1}{8}$ inch.....\$2.60
 Double ended for $\frac{1}{4}$ to $\frac{3}{4}$ inch..... 5.20

Nos. 52 and 52½—Single ended for $\frac{1}{4}$ and $\frac{3}{8}$ inch..... 3.10
 Double ended for $\frac{1}{2}$ to 1½ inch..... 6.20

NOS. 41 TO 49 SINGLE ENDED DIES

Nos.	Size of Pipe Threaded	Without Cut-off	With Cut-off	Price of Complete Set Dies	Singles Sets in Complete Set	Price of Single Sets (4 Pieces)
41	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$	\$12.00	15.00	5.20	2	2.60
41½	$\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$	14.00	17.00	7.80	3	2.60
42	$\frac{1}{2}$, $\frac{3}{4}$, 1, 1½	15.50	18.50	6.20	2	3.10
42½	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, 1½	17.00	20.00	9.30	3	3.10
43	1, 1½, 1½, 2	22.00	25.00	7.40	2	3.70
43½	$\frac{1}{2}$, $\frac{3}{4}$, 1, 1½, 1½, 2	25.00	28.00	11.00	3	3.70
44	1½, 2, 2½, 3	40.00	45.00	13.00	2	6.50
45	2½, 3, 3½, 4	55.00	60.00	15.00	2	7.50
47	$\frac{1}{2}$, $\frac{3}{4}$, 1, 1½	18.50	21.50	6.20	2	3.10
47½	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, 1½	20.00	23.00	9.30	3	3.10
48	1, 1½, 1½, 2	25.00	28.00	7.40	2	3.70
48½	$\frac{1}{2}$, $\frac{3}{4}$, 1, 1½, 1½, 2	28.00	31.00	11.10	3	3.70
49	2½, 3, 3½, 4	60.00	65.00	15.00	2	7.50

Ratchet Pattern

Die Stocks are sent with Cut-off, unless otherwise ordered.

With the exception of those for $\frac{1}{4}$ inch pipe, each set of dies threads two sizes.

OSTER BULL DOG DIE STOCKS

Regular Stock
Nos. 101 to 104½

FIG. 2297

The 82 Stock



FIG. 2298

Ratchet Stock
Nos. 102R to 105½R

FIG. 2299

This line of stocks has Self-locking and Adjustable Dies. By moving the top handle to the right as far as it will go, the dies are set and held in place while cutting.

One movement of the handle will open or close the dies. No resetting or backing off the threads.

Range of Sizes of Pipe				Regular Stocks		Ratchet Stocks		Extra Dies Per Set (4 pcs.)	Shipping Wt. Complete, lbs.	
One Set	One Set	One Set	One Set	Cat. No.	List Price Complete	Catalog Number	List Price Complete		Plain	Ratchet
1/4	1/4 & 3/8	1/4 & 3/8	1/4 to 3/4	82	\$13.00			\$3.50	10	..
1/4 & 3/8	1/2 & 3/4	1 & 1 1/4		101	13.00			2.50	11	..
1 & 1 1/4	1 1/2 & 2	1 1/2 & 2		102	17.00	102 R	\$20.00	3.00	20	24
1 1/2 & 2	1 3/4 & 2 1/4	1 3/4 & 2 1/4		103	22.00	103 R	27.00	3.50	27	34
1 3/4 & 2 1/4	1 3/4 & 2 1/4	1 3/4 & 2 1/4		104	25.00	104 R	30.00	3.50	29	35
1 3/4 & 2 1/4	1 3/4 & 2 1/4	1 3/4 & 2 1/4		104 1/2	28.00			3.50	30	..
1 3/4 & 2 1/4	2 1/2 & 3	2 1/2 & 3		105	40.00	105 R	50.00	5.00	62	70
1 3/4 & 2 1/4	1 1/2 & 2	2 1/2 & 3		105 1/2	43.00	105 1/2 R	53.00	5.00	65	73
2 1/2 & 3	3 1/2 & 4	3 1/2 & 4		107	55.00	107 R	60.00	6.00	94	138
1 1/2 & 2	2 1/2 & 3	3 1/2 & 4		107 1/2	58.50	107 1/2 R	63.50	6.00	98	142
2 1/2 & 3	2 1/2 & 3	3 1/2 & 4		..	..	108 R	75.00	10.00	..	137
1 1/2 & 2	2 1/2 & 3	3 1/2 & 4		..	..	108 1/2 R	80.00	10.00	..	140

Nos. 105 to 107½ operated with four handles. Nos. 107R to 108½R, operated with four handles or two handles as a ratchet stock. All tools supplied with dies and handles complete at above list prices.

OSTER MATCHLESS DIE STOCKS



FIG. 2300

No. 3BR MATCHLESS RATCHET STOCK is similar, but has the added convenience of the ratchet feature. Chips and oil cannot clog the leader screw in either tool.

It makes a practical tool for close quarters. The stock can be used with or without the ratchet.

Catalog No.	Sets of Dies	List Price	Extra Dies	Ship. Wgt. Lbs.
1B 1/2" to 3/4"	1	\$14.50	\$2.50	11
3B 1" to 2"	1	30.00	3.50	25
3BR Ratchet) 1" to 2"	1	35.00	3.50	36

A self contained Easy Pipe Threader without any loose dies, loose bushings, or set screws.

These stocks are equipped with narrow easy cutting dies, one set dies for all sizes 1 to 2-inch pipe.

The pipe is centered in the dies by the adjustable guides and these are locked on the pipe by a wing nut.

The leader screw is covered to keep the chips and dirt out of the threads, by a patented chip shield.

Ratchet Pattern
Top View
Will swing in 14 in. circle, can
thread pipe 5 in. from wall.



FIG. 2301

FORBES PIPE CUTTING AND THREADING MACHINES WITH OPENING AND ADJUSTABLE DIES

For Hand, No. 36.

For Hand or Power, No. 94



FIG. 2302

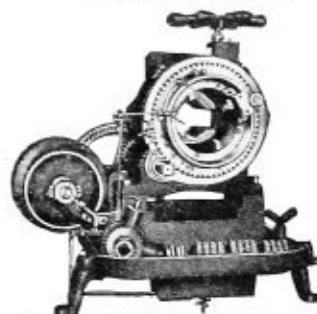


FIG. 2303

Hand Machines				Hand or Power Machine			
Number	Threads Pipe, Inches	Approx. Net Wt., Lbs.	Price Each	Number	Threads Pipe, Inches	Approx. Net Wt., Lbs.	Price Each
*30	1 $\frac{1}{4}$ to 2, R. and L.	155	\$170.00	*70	1 $\frac{1}{4}$ to 2, R. and L.	376	\$335.00
*32	1 $\frac{1}{4}$ to 2, For Solid Dies, Dies not Furnished	140	150.00	*72	1 $\frac{1}{4}$ to 2, For Solid Dies, Dies not Furnished	352	320.00
*34	1 to 3, R. H., 1 to 2, L. H.	185	250.00	*74	1 to 3, R. H., 1 to 2, L. H.	491	420.00
*36	3 $\frac{1}{4}$ to 3, R. H., 3 $\frac{1}{4}$ to 2, L. H.	190	285.00	*76	3 $\frac{1}{4}$ to 3, R. H., 3 $\frac{1}{4}$ to 2, L. H.	484	450.00
*37	1 $\frac{1}{4}$ to 3, R. and L.	200	350.00	*77	1 $\frac{1}{4}$ to 3, R. and L.	490	520.00
*38	1 $\frac{1}{2}$ " 4, R. H.	251	335.00	*78	2 $\frac{1}{2}$ " 4, R. H.	652	470.00
*40	1 $\frac{1}{2}$ " 4, R. and L.	257	385.00	*80	1 $\frac{1}{2}$ " 4, R. H.	644	500.00
*42	1 " 4, R. H.	253	370.00	*82	1 $\frac{1}{2}$ " 4, R. and L.	665	550.00
*44	1 " 4, R. and L.	260	435.00	*84	1 " 4, R. H.	662	535.00
*46	2 $\frac{1}{2}$ " 4, R. H.	237	285.00	*86	1 " 4, R. and L.	648	600.00
*50	4 " 6, R. H.	341	385.00	*88	4 " 6, R. H.	758	570.00
*52	3 $\frac{1}{2}$ " 6, R. H.	341	435.00	*90	3 $\frac{1}{2}$ " 6, R. H.	802	600.00
*54	2 $\frac{1}{2}$ " 5, R. H.	343	500.00	*92	2 $\frac{1}{2}$ " 5, R. H.	810	670.00
*56	2 $\frac{1}{2}$ " 6, R. H.	345	585.00	*94	2 $\frac{1}{2}$ " 6, R. H.	800	750.00
*58	1 " 6, R. H.	384	635.00	*96	1 " 6, R. and L.	818	850.00
*60	1 " 6, R. and L.	404	785.00	*98	1 " 6, R. H.	860	835.00
*61	2 $\frac{1}{2}$ " 6, R. and L.	398	685.00	*98	1 " 6, R. and L.	881	950.00
*62	2 $\frac{1}{2}$ " 6, R. Ex. Hy.	815	1000.00	*98	1 " 8, R. H.	1359	1785.00
*62	1 " 6, R. and L.	845	1170.00	*99	2 $\frac{1}{2}$ " 8, R. and L.	1326	1785.00
*63	2 $\frac{1}{2}$ " 8, R. and L.	661	1200.00	*99	2 $\frac{1}{2}$ " 8, R. and L.	1370	1900.00
*64	2 $\frac{1}{2}$ " 8, R. H.	673	1085.00	*99	1 " 8, R. H.	1500	1670.00
*65	1 " 8, R. H.	671	1200.00	*100	2 $\frac{1}{2}$ " 10, R. H.	2025	2335.00
*65	1 " 8, R. and L.	660	1320.00	*102	2 $\frac{1}{2}$ " 10, R. H.	2150	2335.00
*66	2 $\frac{1}{2}$ " 10, R. H.	989	1670.00	*104	2 $\frac{1}{2}$ " 10, R. H.	2200	2500.00
*67	2 $\frac{1}{2}$ " 10, R. H.	995	1670.00	*106	2 $\frac{1}{2}$ " 12, R. and L.	3725	3900.00
*68	2 $\frac{1}{2}$ " 10, R. and L.	1025	1835.00	*107	2 $\frac{1}{2}$ " 12, R. H.	4156	3335.00
*69	2 $\frac{1}{2}$ " 12, R. H.	2293	2170.00	*108	2 $\frac{1}{2}$ " 12, R. and L.		
*69	2 $\frac{1}{2}$ " 12, R. and L.	2525	2500.00				
*69	4 I. D. to 15 O. D., R. H.	2647	3335.00				

*Pressure feed machines. †Lead screw machines.

Numbers 30 to 37 and 70 to 77 have no cut-off attachment, unless specially ordered.

The prices of hand or power machines include countershaft, ratchet wrench and pipe rest.

FORBES PIPE CUTTING AND THREADING MACHINES

Combined Hand and Power

Motor Driven

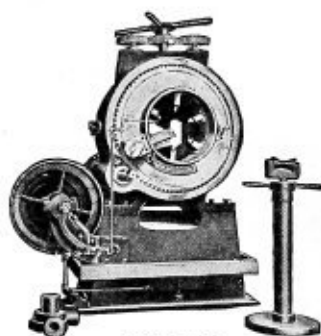


FIG. 2304



FIG. 2305

COMBINED HAND AND POWER MACHINES

No.	Range	Approx. Net Weight	Floor Space	Price
*109	1 to 6 inch, R. H.	2000	27x43 in.	\$1,370.00
x110	2½ to 6 inch, R. H.	2254	25x28 in.	1,335.00
*111	1 to 6 inch, R. and L.	1920	27x43 in.	1,435.00
x112	2½ to 8 inch, R. H.	2525	28x45 in.	2,170.00
*114	2½ to 8 inch, R. and L.	2725	28x45 in.	2,500.00
x120	4 I. D. to 15 inch, O. D., R. H.	5990	38x60 in.	5,000.00

*Pressure feed machine. xLead screw machine.

Weights given are net without boxing, and are not guaranteed as they will vary somewhat.

DIRECT CONNECTED MOTOR DRIVEN PIPE CUTTING
AND THREADING MACHINES

Number	Range	Price
*230	¼ to 2 inch, R. and L. H.	\$1,050.00
*234	1 to 3 inch, R. H., 1 to 2 inch, L. H.	1,135.00
*236	¾ to 3 inch, R. H., ¾ to 2 inch, L. H.	1,170.00
*237	¼ to 3 inch, R. and L. H.	1,235.00
*238	1½ to 4 inch, R. H.	1,220.00
*240	1½ to 4 inch, R. and L. H.	1,270.00
*242	1 to 4 inch, R. H.	1,250.00
*244	1 to 4 inch, R. and L. H.	1,320.00
x246	2½ to 4 inch, R. H.	1,200.00
x250	4 to 6 inch, R. H.	1,420.00
x252	3½ to 6 inch, R. H.	1,450.00
x254	2½ to 5 inch, R. H.	1,450.00
x256	2½ to 6 inch, R. H.	1,535.00
*258	1 to 6 inch, R. H.	1,585.00
*260	1 to 6 inch, R. and L. H.	1,735.00
x264	2½ to 8 inch, R. H.	2,335.00
*265	1 to 8 inch, R. H.	2,420.00
*267	2½ to 10 inch, R. H.	3,000.00
x269	2½ to 12 inch, R. H.	4,000.00

*Pressure feed machine. xLead screw machine.

The above prices are based on the supposition that the motor is intended for the ordinary current, such as D. C., or 2 or 3 phase A. C., while if it is for single phase A. C., there will be an additional charge to the above mentioned price.

OSTER PIPE MACHINES FOR HAND USE

No. 201 Front View



FIG. 2306

These machines are complete with a pipe vise. This pipe vise is self-centered. By the movement of the top vise wheel, the pipe is brought central with the dies, and straight threads are assured, without any attention on the part of the operator. No previous experience is required in cutting a straight and perfect thread in this machine. The dies are opened or closed by the movement of the small lever handle, which you will notice on the top at the front of the machine. This lever handle is thrown out of its notch, when the pipe can be removed without turning back over the finished threads.

One set of dies will thread two sizes of pipe, and to change dies, move the setting plate to the left as far as it will go, when the die can be inserted or removed through the die head without removing any part of the machine.

Nos. 204 and 206



FIG. 2307

No.	Size Right Hand Inches	Sets of Dies	Price Without Tripod	Extra Dies per Set	Price Tripod Stand	Shipping Weight Pounds
201	1/4 to 2	4	\$ 90.00	\$4.50	\$15.00	275
204	1 to 4	4	210.00	6.00	15.00	575
206	1 to 6	6	337.50	7.50	37.50	975

OSTER LIGHT HAND MACHINES

WITH ADJUSTABLE CENTERING CHUCK FOR THREADING 2 1/2-INCH TO 4-INCH PIPE, AND 2 1/2-INCH TO 6-INCH PIPE

Nos. 16 and 17 from the front



FIG. 2308

These are portable pipe tools. Can be used as a Die Stock; as a Bench Tool; or complete with Tripod Stand. Strictly a one man outfit.

These tools have no leading screw; the dies are started with a lever handle. One movement of the lever brings the head to position for the next cut without backing over the finished threads. No pipe vise is required.

Number	16	17
Threads, pipe	2 1/2 to 4	2 1/2 to 6
Price with bench bracket,		
Price with tripod, complete,		
Price dies per set of four pieces, each	9.00	11.00
Ship. wt. complete with tripod,	275	500

Nos. 16 and 17 from the side



FIG. 2309

OSTER PIPE AND NIPPLE MACHINES

These machines perform every one of the many pipe threading jobs in ordinary use, pieces long or short, straight or bent, over or under size, nipples any length, and all thread nipples, and also bolts.

Every operating part is right under the hand. Quick results are given by the lever controlled die head, which is released, and reset instantly after the thread is finished. The vise grips the work by a single turn of the wheel bringing it to an absolute center. All bearings are large and the vise has no chance of getting out of alignment with the center of the dies.



FIG. 2310

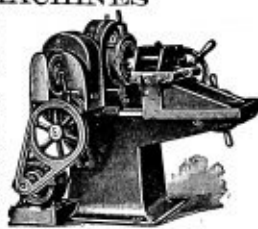


FIG. 2311

Number	Sizes of pipe	Sets of Dies	List Price	Extra Dies Per Set. (4 Pcs.)	Shipping Weights Lbs.	Drive	Nipple Jaws Each Size
300A	1/4 to 2	4	\$ 315.00	\$ 4.50	1050	Belt	\$11.25
304A	1 to 4	4	475.00	6.00	1550	Belt	11.25
306A	1 1/4 to 6	6	660.00	7.50	2240	Belt	15.00
308A	2 1/2 to 8	6	1200.00	15.00	4200	Belt	.....
300B	1/4 to 2	4	485.00	4.50	1050	Motor	11.25
304B	1 to 4	4	700.00	6.00	1700	Motor	11.25
306B	1 1/4 to 6	6	925.00	7.50	2600	Motor	15.00
308B	2 1/2 to 8	6	1500.00	15.00	4800	Motor	.....

LITTLE GIANT THREADING MACHINES

FOR BOLTS, NUTS AND PIPE WITH AUTOMATIC OPENING DIE HEAD

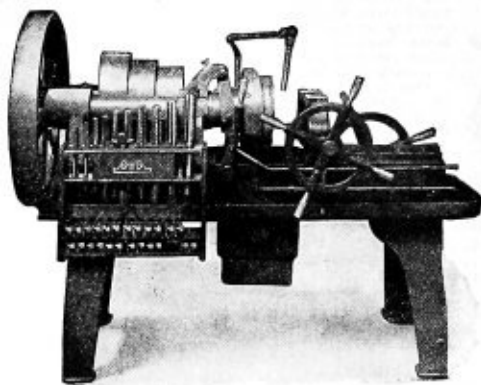


FIG. 2312

The automatic opening die heads give maximum efficiency to the machines, and effect a very material saving in the time and labor of operators. The cutting dies can be adjusted to .001 of an inch, assuring precise and accurate work.

Specifications.....	No. 732	No. 734	No. 736
Capacity for bolts and nuts...in.	$\frac{1}{4}$ to 1	$\frac{1}{4}$ to $1\frac{1}{2}$	$\frac{1}{2}$ to 2
Capacity for pipe.....inches	$\frac{1}{8}$ to 1	$\frac{1}{4}$ to 2	$\frac{1}{4}$ to 2
Cutting sizes	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{8}$, $1\frac{1}{2}$	$\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{8}$, $1\frac{1}{2}$, $1\frac{3}{4}$, 2
Cone pulley, diameter...inches	6, 8, and 10	8, 10 and 12	10, 12 and 14
Width of belt.....inches	3	$3\frac{1}{2}$	$4\frac{1}{2}$
Countershaft pulleys.....inches	12x4	12x4	14x4
Speed of countershaft...R.P.M.	250	300	300
Gearing	5 to 1	8 to 1	12 to 1
Approximate net weight...lbs.	925	1300	1625
Approximate crated weight...lbs.	1050	1450	1950
Dimensions (boxed).....inches	57x36x28	64x37x37	72x41x39
Floor space occupied.....inches	32x56	32x56	41x69
Price without countershaft.....	\$230.00	\$360.00	\$410.00
Price with plain countershaft...	247.00	320.00	435.00
Price with friction countershaft.	270.00	340.00	455.00
Pipe dies—extra.....	15.00	24.00	32.00

LITTLE GIANT THREADING MACHINE FOR BOLTS AND NUTS

No. 701

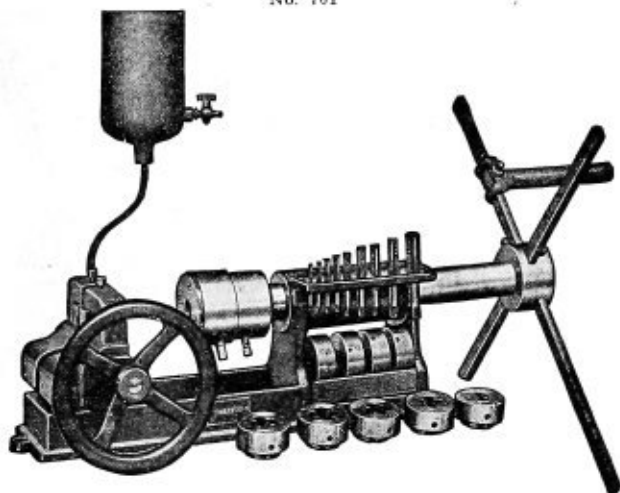


FIG. 2313

BENCH MACHINE FOR HAND USE

Capacity. $\frac{1}{4}$ -in. to 1-in. bolt threads.

Spindle. $1\frac{1}{8}$ -in. dia. hole full length.

Spindle travels longitudinally through bearing.

Length of Thread. $7\frac{1}{4}$ -in. at one setting of jaws.

Carriage. Stationary. Jaw supports opened and closed by hand wheel and fitted with hardened tool steel grip-jaws for holding a variety of sizes and shapes.

No. 701A.	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$ -in.	\$40.00
No. 701B.	$\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1-in.	45.00

Above assortments include machine complete with Tap Chuck, Hand Taps for each cutting size, Little Giant Dies and Collets (same as used in Little Giant Screw Plates) Wrenches and Handles.

U. S. Standard threads furnished unless otherwise specified.

Bench Space. 24x9 in.

Weight. Net 126 lbs., boxed 165 lbs.

Dimensions. Boxed 26x14x12 in. $2\frac{1}{2}$ cubic feet.

ARMSTRONG ADJUSTABLE STOCK AND DIES FOR THREADING BOLTS



FIG. 2314

No. 1 Stock, 7 bolt dies, $\frac{1}{4}$ to $\frac{3}{4}$ inch.....	\$15.00
" 1 " 4 pipe and 7 bolt dies.....	20.00
" 1 " 7 bolt dies, 7 taps, $\frac{1}{4}$ to $\frac{3}{4}$ inch.....	20.50
" 1 " 4 pipe " 7 bolt dies, 7 taps.....	25.50

These sizes and threads of bolt dies will be furnished with this stock unless otherwise ordered: $\frac{1}{4}$ -20, $\frac{5}{16}$ -18, $\frac{3}{8}$ -16, $\frac{7}{16}$ -14, $\frac{1}{2}$ -12, $\frac{9}{16}$ -11, $\frac{3}{4}$ -10. Intermediate sizes are special.

This stock will not take bolt sizes smaller than $\frac{1}{4}$ inch, nor larger than $\frac{3}{4}$ inch. The dies are made regularly in V, U. S. Standard and Whitworth threads, either right hand or left hand.

Stay bolt dies furnished for this stock $\frac{3}{4}$ inch. Twelve threads.

FOR MACHINISTS AND BLACKSMITHS

No. 2 Stock, 7 bolt dies $\frac{1}{2}$ -1 $\frac{1}{4}$	\$20.00
" 2 " 9 " " $\frac{1}{2}$ -1.....	25.00
" 2 " 11 " " $\frac{1}{2}$ -1 $\frac{1}{4}$	30.00
" 2 " 7 " " 5 pipe dies.....	28.50
" 2 " 7 " " 7 taps, $\frac{1}{2}$ -1 $\frac{1}{4}$	32.00
" 2 " 9 " " 9 " " $\frac{1}{2}$ -1.....	35.00
" 2 " 11 " " 11 " " $\frac{1}{2}$ -1 $\frac{1}{4}$	45.00
" 2 " 7 " " $\frac{1}{2}$ -1 $\frac{1}{4}$, 7 taps, $\frac{1}{2}$ -1 $\frac{1}{4}$, 5 pipe dies $\frac{1}{2}$ -1 R.....	40.00

Bolt dies for this stock are furnished with the following sizes: $\frac{1}{2}$ -20, $\frac{5}{16}$ -18, $\frac{3}{8}$ -16, $\frac{7}{16}$ -14, $\frac{1}{2}$ -12, $\frac{9}{16}$ -11, $\frac{3}{4}$ -10, $\frac{1}{2}$ -8, $\frac{1}{4}$ -7. Unless otherwise ordered this stock will be shipped with bolt dies from $\frac{1}{2}$ to $\frac{1}{4}$ inch. Dies can be furnished in either V, U. S. Standard, or Whitworth threads regularly, either right hand or left hand.

Stay bolt dies furnished for this stock from $\frac{3}{4}$ -1 $\frac{1}{4}$. All 12 threads.

No. 3 Stock, bolt dies, $\frac{7}{8}$ -0, $\frac{1}{2}$, $1\frac{1}{8}$ -7, $1\frac{1}{4}$ -7, $1\frac{3}{8}$ -6, $1\frac{1}{2}$ -0.....	\$38.00
" 3 " " " $\frac{1}{2}$, $\frac{3}{4}$, $\frac{7}{8}$, $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{8}$, $1\frac{1}{2}$	55.00
" 3 " 6 " " $\frac{1}{2}$ -1 $\frac{1}{4}$	54.00
" 3 " 6 " taps, $\frac{1}{2}$ -1 $\frac{1}{4}$	
" 3 " 9 " dies, $\frac{1}{2}$ -1 $\frac{1}{4}$	
" 3 " 9 " taps, $\frac{1}{2}$ -1 $\frac{1}{4}$	75.00

Bolt sets sent without taps unless otherwise specified.

LITTLE GIANT SINGLE STOCKED SCREW PLATES

Assortment No. 40



FIG. 2315

No.	Length of Stock Inches	Diameter of Collet Inches	One (Taper) Tap and One Die for Each Size Indicated	Price per Set
1	14½	2	¼ ²⁰ , ⅝ ¹⁸ , ⅜ ¹⁶ , 7⁄16 ¹⁴ , 1½ ¹³	18.50
2	23	2¾	¼ ²⁰ , ⅝ ¹⁶ , ⅜ ¹⁵ , 5⁄8 ¹¹ , 3⁄4 ¹⁰	22.75
3	26	2¾	⅝ ¹¹ , ⅜ ¹⁰ , 7⁄8 ⁹ , 1 ⁸	26.25
4	26	2¾	1½ ¹³ , ⅝ ¹¹ , ¾ ¹⁰ , 7⁄8 ⁹ , 1 ⁸	29.25
5	23	2¾	¼ ²⁰ , ⅝ ¹⁸ , ⅜ ¹⁶ , 7⁄16 ¹⁴ , 1½ ¹³ , 5⁄8 ¹¹ , ¾ ¹⁰	27.50
5½	23	2¾	¼ ²⁰ , ⅝ ¹⁸ , ⅜ ¹⁶ , 7⁄16 ¹⁴ , 1½ ¹³ , 5⁄8 ¹² , 5⁄8 ¹¹ , ¾ ¹⁰	30.75
6	26	2¾	⅜ ¹⁶ , 7⁄16 ¹⁴ , 1½ ¹³ , 5⁄8 ¹¹ , ¾ ¹⁰ , 7⁄8 ⁹ , 1 ⁸	35.00
7	26	2¾	¼ ²⁰ , ⅝ ¹⁸ , ⅜ ¹⁶ , 7⁄16 ¹⁴ , 1½ ¹³ , 5⁄8 ¹¹ , ¾ ¹⁰ , 7⁄8 ⁹ , 1 ⁸	42.00
7½	26	2¾	¼ ²⁰ , ⅝ ¹⁸ , ⅜ ¹⁶ , 7⁄16 ¹⁴ , 1½ ¹³ , 5⁄8 ¹² , 5⁄8 ¹¹ , ¾ ¹⁰ , 7⁄8 ⁹ , 1 ⁸	44.25
8	14½ and 26	2 and 2¾	¼ ²⁰ , ⅝ ¹⁸ , ⅜ ¹⁶ , 7⁄16 ¹⁴ , 1½ ¹³ , 5⁄8 ¹¹ , ¾ ¹⁰	30.00
9	14½ " 29	2 " 2¾	¼ ²⁰ , ⅝ ¹⁸ , ⅜ ¹⁶ , 7⁄16 ¹⁴ , 1½ ¹³ , 5⁄8 ¹¹ , ¾ ¹⁰ , 7⁄8 ⁹ , 1 ⁸	43.50
20	40	4	5⁄8 ¹¹ , ¾ ¹⁰ , 7⁄8 ⁹ , 1 ⁸ , 1½ ⁷ , 1¼ ⁷	53.50
25	52	4½	7⁄8 ⁹ , 1 ⁸ , 1½ ⁷ , 1¼ ⁷ , 1⅜ ⁶ , 1½ ⁶	70.00
30	52	4½	1½ ⁷ , 1¼ ⁷ , 1⅜ ⁶ , 1½ ⁶	59.00
40	23 and 40	2¾ and 4	¼ ²⁰ , ⅝ ¹⁸ , ⅜ ¹⁶ , 7⁄16 ¹⁴ , 1½ ¹³ , 5⁄8 ¹² , 5⁄8 ¹¹ , ¾ ¹⁰ , 7⁄8 ⁹ , 1 ⁸ , 1½ ⁷ , 1¼ ⁷	68.50
50	26 " 52	2¾ " 4½	¼ ²⁰ , ⅝ ¹⁸ , ⅜ ¹⁶ , 7⁄16 ¹⁴ , 1½ ¹³ , 5⁄8 ¹¹ , ¾ ¹⁰ , 7⁄8 ⁹ , 1 ⁸ , 1½ ⁷ , 1¼ ⁷ , 1⅜ ⁶ , 1½ ⁶	92.00

Each assortment is put up in an oiled and varnished hardwood cabinet and has a Little Giant Adjustable Tap Wrench, suitable for holding the range of tap sizes in the assortment. Nos. 7, 7½, 9, 40 and 50 have two tap wrenches.

U. S. S. threads furnished unless otherwise ordered. S. A. E. and Whitworth standard threads furnished, when specified, at regular prices.

All threads and sizes not listed are special. Left-hand threads are special.

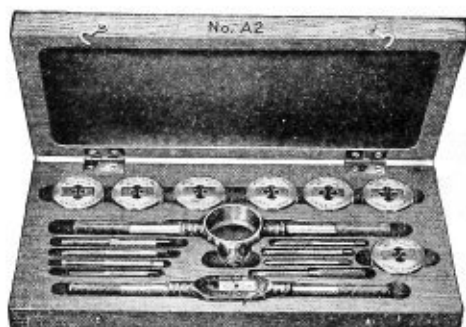


FIG. 2316

LITTLE GIANT SINGLE STOCKED SCREW PLATES

Each of the assortments listed below contains Little Giant Dies and Plug Taps in addition to the Collets Stocks and Tap Wrenches specified.

U. S. Standard Threads furnished unless otherwise ordered.

No.			Price
A1.	5 Sizes:	$\frac{1}{8}$ " $\frac{3}{16}$ " $\frac{1}{2}$ " $\frac{5}{8}$ " $1\frac{1}{2}$ "	Weight 2½ pounds.....\$11.50
A1½.	7 Sizes:	$\frac{1}{8}$ " $\frac{3}{16}$ " $\frac{1}{2}$ " $\frac{5}{8}$ " $1\frac{1}{2}$ " $2\frac{1}{2}$ " $3\frac{1}{2}$ "	Weight 3 pounds.....14.50
A2.	7 Sizes:	$\frac{1}{8}$ " $\frac{3}{16}$ " $\frac{1}{2}$ " $\frac{5}{8}$ " $1\frac{1}{2}$ " $2\frac{1}{2}$ " $3\frac{1}{2}$ "	Weight 3 pounds.....14.50
A3.	10 Sizes:	$\frac{1}{8}$ " $\frac{3}{16}$ " $\frac{1}{2}$ " $\frac{5}{8}$ " $1\frac{1}{2}$ " $2\frac{1}{2}$ " $3\frac{1}{2}$ " $4\frac{1}{2}$ " $5\frac{1}{2}$ " $6\frac{1}{2}$ "	Weight 4 pounds.....19.50
AA2.	5 Sizes:	4" 6" 8" 10" 12"	Weight 2½ pounds.....11.50
AA4.	7 Sizes:	4" 6" 8" 10" 12" 14" 16"	Weight 3 pounds.....14.50
The above Screw Plates are equipped as follows: 1½ inch diameter Collets; Stock 7½ inches long and Adjustable Tap Wrench No. 0 (7½ inches long).			
A10.	7 Sizes:	$\frac{1}{8}$ " $\frac{3}{16}$ " $\frac{1}{2}$ " $\frac{5}{8}$ " $1\frac{1}{2}$ " $2\frac{1}{2}$ " $3\frac{1}{2}$ "	18.25
1½ inch diameter Collets for sizes $\frac{1}{8}$ inch and smaller, 1½ inch diameter Collets for sizes $\frac{3}{16}$ inch and larger, 2 Stocks 7½ inches and 13½ inches long, and Adjustable Tap Wrench No. 4 (9 inches long). Weight 5½ pounds.			

LITTLE GIANT SCREW PLATES FOR AUTOMOBILES

WITH S. A. E. (FORMERLY A. L. A. M.) STANDARD THREADS

Each of the assortments listed below contains Little Giant Dies and Plug Taps, in addition to the Stocks, Collets and Tap Wrenches specified.

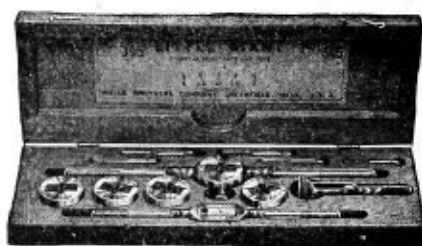


FIG. 2317

No. 395.	5 Sizes:	$\frac{1}{4}$ " $\frac{3}{8}$ " $\frac{1}{2}$ " $\frac{5}{8}$ " $1\frac{1}{2}$ "	18.50
2 inch diameter Collets; Stock 14½ inches long, Bit Brace Shank and Adjustable Tap Wrench No. 5 (11½ inches long). Weight 8 pounds.			
No. 396.	6 Sizes:	$\frac{3}{8}$ " $\frac{1}{2}$ " $\frac{5}{8}$ " $1\frac{1}{2}$ " $2\frac{1}{2}$ " $3\frac{1}{2}$ "	32.75
2¾ inch diameter Collets; Stocks 26 inches long and Adjustable Tap Wrench No. 7 (19½ inches long). Weight 21½ pounds.			
No. 397.	11 Sizes:	$\frac{1}{4}$ " $\frac{3}{8}$ " $\frac{1}{2}$ " $\frac{5}{8}$ " $1\frac{1}{2}$ " $2\frac{1}{2}$ " $3\frac{1}{2}$ " $4\frac{1}{2}$ " $5\frac{1}{2}$ " $6\frac{1}{2}$ " $7\frac{1}{2}$ "	48.25
2¾ inch diameter Collets; Stock 26 inches long; 2 Adjustable Tap Wrenches, No. 5 (11½ inches long) and No. 7 (19½ inches long). Weight 30 pounds.			

All Taps and Dies in above sets have S. A. E. (formerly A. L. A. M.) Standard Threads unless otherwise ordered.

LITTLE GIANT FULL MOUNTED SCREW PLATES

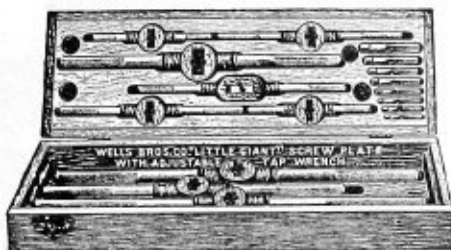


FIG. 2318

A separate stock for each die is furnished with these sets.

No.	One (Taper) Tap and One Die for Each Size Indicated	Price per Set
61	$\frac{1}{4}$ 29, $\frac{5}{16}$ 18, $\frac{3}{8}$ 16, $\frac{7}{16}$ 14, $\frac{1}{2}$ 12	\$22.00
62	$\frac{1}{4}$ 20, $\frac{3}{8}$ 16, $\frac{1}{2}$ 12, $\frac{5}{8}$ 10, $\frac{3}{4}$ 10	29.00
63	$\frac{5}{8}$ 11, $\frac{3}{4}$ 10, $\frac{7}{8}$ 9, 1" 8	36.50
64	$\frac{1}{2}$ 15, $\frac{5}{8}$ 11, $\frac{3}{4}$ 10, $\frac{7}{8}$ 9, 1" 8	37.50
65	$\frac{1}{4}$ 20, $\frac{5}{16}$ 18, $\frac{3}{8}$ 16, $\frac{7}{16}$ 14, $\frac{1}{2}$ 12, $\frac{5}{8}$ 10, $\frac{3}{4}$ 10	34.50
65 1/2	$\frac{1}{4}$ 20, $\frac{5}{16}$ 18, $\frac{3}{8}$ 16, $\frac{7}{16}$ 14, $\frac{1}{2}$ 12, $\frac{5}{8}$ 10, $\frac{3}{4}$ 10	38.50
67	$\frac{1}{4}$ 20, $\frac{5}{16}$ 18, $\frac{3}{8}$ 16, $\frac{7}{16}$ 14, $\frac{1}{2}$ 12, $\frac{5}{8}$ 10, $\frac{3}{4}$ 10, 1" 8	54.00
67 1/2	$\frac{1}{4}$ 20, $\frac{5}{16}$ 18, $\frac{3}{8}$ 16, $\frac{7}{16}$ 14, $\frac{1}{2}$ 12, $\frac{5}{8}$ 10, $\frac{3}{4}$ 10, 1" 8	58.25
640	$\frac{1}{4}$ 20, $\frac{5}{16}$ 18, $\frac{3}{8}$ 16, $\frac{7}{16}$ 14, $\frac{1}{2}$ 12, $\frac{5}{8}$ 10, $\frac{3}{4}$ 10, 1" 8, 1 1/8, 1 1/4	77.50
650	$\frac{1}{4}$ 20, $\frac{5}{16}$ 18, $\frac{3}{8}$ 16, $\frac{7}{16}$ 14, $\frac{1}{2}$ 12, $\frac{5}{8}$ 10, $\frac{3}{4}$ 10, 1" 8, 1 1/8, 1 1/4, 1 3/8, 1 1/2	111.00

Each assortment is put up in an oiled and varnished hardwood cabinet and has a Little Giant Adjustable Tap Wrench, suitable for holding the range of tap sizes in the assortment.

Nos. 67, 67 1/2, 640 and 650 each have two tap wrenches.

U. S. S. threads furnished unless otherwise ordered. S. A. E. and Whitworth Standard threads furnished, when specified, at regular prices.

All sizes and threads not listed are special. Left-hand threads are special.

STOCKS FOR SCREW PLATES SHOWN ABOVE



FIG. 2319

Size	Prices of Stocks and Parts				Stock, Die and Guide complete	Size	Prices of Stocks and Parts				Stock, Die and Guide complete
	Stock only	Length of Stock In.	Guide only	Die only			Stock only	Length of Stock In.	Guide only	Die only	
$\frac{3}{16}$	\$1.00	8 3/4	\$0.20	\$1.00	\$2.20	$\frac{3}{4}$	\$2.00	25 1/2	\$0.20	\$2.00	\$4.20
$\frac{1}{4}$	1.00	8 3/4	.20	1.00	2.20	$\frac{1}{2}$	2.25	29	.20	2.00	4.45
$\frac{5}{16}$	1.00	8 3/4	.20	1.00	2.20	$\frac{7}{8}$	2.25	29	.20	2.75	5.20
$\frac{3}{8}$	1.25	13 1/2	.20	1.25	2.70	$\frac{1}{2}$	2.25	29	.20	2.75	5.20
$\frac{1}{2}$	1.25	13 1/2	.20	1.25	2.70	1	2.25	29	.20	2.75	5.20
$\frac{5}{8}$	1.50	20 1/2	.20	1.50	3.20	$1\frac{1}{4}$	4.00	39 1/2	.50	4.00	8.50
$\frac{3}{4}$	1.50	20 1/2	.20	1.50	3.20	$1\frac{3}{4}$	4.00	39 1/2	.50	4.00	8.50
$\frac{7}{8}$	2.00	25 1/2	.20	1.75	3.95	1 3/4	6.00	50	.50	5.00	11.50
$1\frac{1}{8}$	2.00	25 1/2	.20	1.75	3.95	$1\frac{1}{2}$	6.00	50	.50	5.00	11.50

AUTOMOBILE SCREW PLATES IN LEATHER ROLLS

S. A. E. STANDARD THREADS

Nos. 1470 and 1471



FIG. 2320

No. 1475

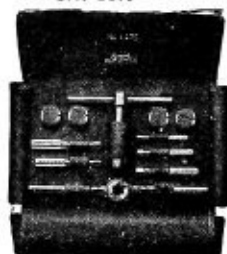


FIG. 2321

- No. 1470. 7 Sizes: $\frac{1}{4}^{28}$, $\frac{5}{16}^{28}$, $\frac{3}{8}^{28}$, $\frac{7}{8}^{28}$, $\frac{1}{2}^{20}$, $\frac{9}{16}^{20}$, $\frac{5}{8}^{20}$ \$16.50
 Plug Taps; Round Adjustable Dies, $1\frac{1}{2}$ inches outside diameter;
 Stock, No. 1853 (14 inches long). Weight $3\frac{3}{4}$ pounds.
- No. 1471. Same as above with Adjustable Tap Wrench, No. 6 (15 inches
 long). Weight $4\frac{1}{2}$ pounds. 20.50
- No. 1475. 5 Sizes: $\frac{1}{4}^{28}$, $\frac{5}{16}^{28}$, $\frac{3}{8}^{28}$, $\frac{7}{8}^{20}$, $\frac{1}{2}^{20}$ 11.75
 Plug Taps; Round Adjustable Dies, 1 inch outside diameter;
 Stock, No. 1852 (9 inches long); "T" Tap Wrench No. 333. Weight
 3 pounds.

GARAGE REPAIR SETS FOR FORD CARS

No. 2500

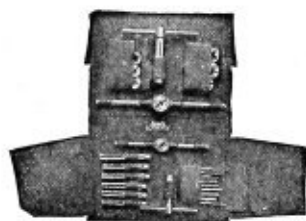


FIG. 2322

No. 2501



FIG. 2323

- No. 2500. 16 Sizes: 6^{12} , 10^{24} , 10^{32} , 12^{24} , 14^{24} , 3^{32} , $1\frac{1}{4}^{28}$, $\frac{5}{16}^{28}$, $\frac{1}{2}^{28}$, $\frac{5}{16}^{24}$, $\frac{3}{8}^{24}$, $\frac{3}{8}^{24}$, $\frac{1}{2}^{24}$, $\frac{7}{8}^{24}$, $\frac{1}{2}^{20}$, and $\frac{1}{4}$ pipe \$24.50
 Plug Taps; Round Adjustable Dies, $\frac{1}{2}$ inch outside diameter for
 sizes $\frac{1}{4}$ inch and smaller, and 1 inch for sizes $\frac{3}{8}$ inch and larger;
 2 Stocks, No. 1851 ($6\frac{3}{4}$ inches long) and No. 1852 (9 inches long);
 2 Adjustable Tap Wrenches, "T" Style, Nos. 329 and 333. Weight
 $2\frac{1}{2}$ pounds.
- No. 2501 8 Sizes: $\frac{1}{4}^{28}$, $\frac{5}{16}^{28}$, $\frac{3}{8}^{28}$, $\frac{1}{2}^{20}$, $\frac{7}{8}^{20}$, $\frac{1}{2}^{20}$, $\frac{1}{4}^{20}$, $\frac{1}{2}^{20}$ 17.00
 Plug Taps; Round Adjustable Dies, 1 inch outside diameter;
 Stock, No. 1852 (9 inches long); Adjustable Tap Wrench, "T"
 Style; Spiral Fluted Reamers, 2-in-1 for spindle body and spindle
 arm bushing, 1 for piston pin bushing. Weight $4\frac{1}{4}$ pounds.

LITTLE GIANT REVERSIBLE ADJUSTABLE DIES



FIG. 2324

FRACTIONAL SIZES

United States Standard form of thread furnished unless otherwise specified. Sizes, dimensions and threads not listed are subject to special prices. Left hand dies are special.

We will furnish at regular prices Little Giant Dies from $\frac{1}{4}$ inch to $\frac{3}{8}$ inch $\frac{1}{4}$ inch oversize and from $\frac{1}{4}$ inch to $1\frac{1}{2}$ inches inclusive $\frac{1}{32}$ inch oversize in standard pitches only of V form.

Cut- ting Sizes	Diameter Collets Price Die Each Size			No. of Threads to the Inch			
	1 $\frac{1}{4}$ "	1 $\frac{5}{8}$ "	$\frac{1}{2}$ " 2 $\frac{3}{4}$ " 4" 4 $\frac{1}{2}$ "	Standard Pitches			Other Threads Also Furnished
				U. S.	S. A. E.	Whit.	
$\frac{1}{16}$	\$0.75	....	....	64	..	60	72
$\frac{3}{32}$	.75	....	....	60	..	..	72
$\frac{1}{8}$	.75	....	....	50	..	48	48, 56
$\frac{3}{16}$	.75	....	....	48	..	..	56
$\frac{1}{4}$	.75	....	....	40	..	40	32
$\frac{5}{16}$	.75	....	....	40	..	..	..
$\frac{3}{8}$	.75	....	....	36	..	32	32
$\frac{7}{16}$	.75	....	....	32	..	..	..
$\frac{1}{2}$	.75	....	1.00	24	..	24	30, 32
$\frac{5}{8}$	.75	....	1.00	24	..	..	..
$\frac{3}{4}$	.75	....	1.00	24	..	24	32
$\frac{7}{8}$	.75	....	1.00	24	..	..	..
$1\frac{1}{8}$	.75	1.00	1.00	20	28	20	24, 32
$1\frac{1}{4}$	....	1.00	1.00	18	24	18	20, 32
$1\frac{3}{8}$	....	1.25	1.25	16	24	16	20
$1\frac{1}{2}$	....	....	1.25	14	20	14	24
$1\frac{3}{4}$	....	....	*1.50	13	20	12	12, 24
2	....	....	1.50	12	18	12	..
$2\frac{1}{4}$	....	....	1.75	11	18	11	12
$2\frac{1}{2}$	....	....	1.75	11	16	11	..
$2\frac{3}{4}$	....	....	2.00	10	16	10	12
3	....	....	2.00	10	..	10	..
$3\frac{1}{4}$	....	....	2.75	9	14, 18	9	12
$3\frac{1}{2}$	....	....	2.75	9	..	9	..
$3\frac{3}{4}$	....	....	2.75	8	14	8	12
4	....	....	4.00	7	12	7	..
$4\frac{1}{4}$	....	....	4.00	7	12	7	..
$4\frac{1}{2}$	....	....	5.00	6	12	6	..
$4\frac{3}{4}$	....	....	5.00	6	12	6	..

*In ordering $\frac{1}{2}$ -inch die specify diameter of collet.

†NOTE. 2-in. Diam. Collets take die sizes $\frac{1}{16}$ -in. to $\frac{1}{2}$ -in. inclusive.

2 $\frac{3}{4}$ -in. Diam. Collets take die sizes $\frac{1}{8}$ -in. to 1-in. inclusive.

4-in. Diam. Collets take die sizes $\frac{5}{16}$ -in. to $1\frac{1}{4}$ -in. inclusive.

4 $\frac{1}{2}$ -in. Diam. Collets take die sizes $\frac{1}{2}$ -in. to $1\frac{1}{2}$ -in. inclusive.

PARTS FOR LITTLE GIANT SINGLE STOCKED SCREW PLATES



FIG. 2325

Length	inches	7½	13½	14½	23	26	29	40	52
Diameter of Collets	inches	1¼	1½	2	2¾	2¾	2¾	4	4½
Price, Stocks only	each	\$1.00	1.25	1.50	3.00	3.00	3.00	6.00	8.00

In ordering, be sure to give the numbers of the assortments stock is for.

Guide



FIG. 2326

Cap



FIG. 2327

Collet



FIG. 2328

Diameter of Collet	inches	1¼	1½	2	2¾	2¾	2¾	4	4½
Price, Guides	each	\$.15	.20	.20	.20	.20	.20	.50	.50
Price, Caps	each	.25	.30	.30	.50	.50	.50	1.00	1.50
Price, Collets, Complete	each	.40	.50	.50	.70	.70	.70	1.50	2.00

In ordering, be sure to give the diameter of collet wanted, and the cutting size of the die with which the collet is to be used. A complete collet consists of a cap and a guide.

ADJUSTABLE TAP WRENCHES

Nos. 00 to 24



FIG. 2329

Nos. 329 and 333

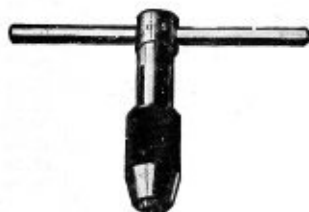


FIG. 2330

G. T. D. Adjustable Tap Wrenches will hold both Hand and Pipe Taps.

Adjustment is obtained by revolving one of the handles.

The jaws are made of fine tool steel, are rigidly held in place, and give a tight, strong grip.

Sizes No. 7 and smaller are made from drop forgings. The body parts of larger sizes are malleable castings, with handles of electrically welded steel tubing, light and very strong.

No.	Capacity (Tap Sizes)				Weight	Price
	Hand Inclusive Inches	Machine Screw Inclusive	Pipe Inclusive Inches	Full Length Inches		
00	$\frac{1}{16}$ to $\frac{3}{16}$	0 to 13	.....	Handle	1½ oz.	\$ 1.25
0	$\frac{1}{16}$ to $\frac{1}{4}$	0 to 18	.....	5	4 oz.	1.50
4	$\frac{1}{16}$ to $\frac{3}{8}$	0 to 24	$\frac{1}{8}$	7	7 oz.	1.75
5	$\frac{1}{16}$ to $\frac{1}{2}$	10 to 30	$\frac{1}{8}$ to $\frac{1}{4}$	9	12 oz.	2.00
6	$\frac{1}{16}$ to $\frac{3}{4}$	14 to 30	$\frac{1}{8}$ to $\frac{3}{8}$	11	2 lbs.	2.50
7	$\frac{3}{16}$ to 1	15 to 30	$\frac{1}{8}$ to $\frac{3}{4}$	15	3½ lbs.	3.50
7½	$\frac{3}{16}$ to 1½	22 to 30	$\frac{1}{4}$ to $\frac{3}{4}$	19	4½ lbs.	6.50
8	$\frac{3}{16}$ to 1½	.....	$\frac{3}{8}$ to 1	31	8 lbs.	8.00
22	1 to 2½	.....	1 to 2	40	12 lbs.	15.00
24	1½ to 4	.....	2 to 4	55	25 lbs.	25.00
				74		
329	$\frac{1}{16}$ to $\frac{5}{16}$	0-18	.....	*Shank		
333	$\frac{1}{16}$ to $\frac{1}{2}$	14-30	$\frac{1}{8}$	2½	3 oz.	.50
336	$\frac{1}{16}$ to $\frac{5}{8}$	0-18	.....	3½	8 oz.	1.00
337	$\frac{1}{16}$ to $\frac{1}{2}$	14-30	$\frac{1}{8}$	8¾	8 oz.	.75
				10½	1¼ lbs.	1.50

* Length from center of T handle to bottom of chuck.

LIGHTNING SINGLE STOCKED SCREW PLATES



FIG. 2331

No.	Length of Stock, In.	Diam. of Collet	One Taper Top and Die for Each Size	Price Per Set
2025	18	2 ³ / ₁₆	$\frac{1}{4}^{20}, \frac{5}{16}^{30}, \frac{3}{8}^{40}, \frac{7}{16}^{50}, \frac{1}{2}^{60}$	18.50
1189	23	2 ³ / ₈	$\frac{1}{4}^{20}, \frac{5}{16}^{30}, \frac{3}{8}^{40}, \frac{7}{16}^{50}, \frac{1}{2}^{60}$	22.75
1195	29	2 ³ / ₈	$\frac{1}{4}^{20}, \frac{5}{16}^{30}, \frac{3}{8}^{40}, \frac{7}{16}^{50}, \frac{1}{2}^{60}$	29.25
1197	29	2 ³ / ₈	$\frac{3}{8}^{40}, \frac{7}{16}^{50}, \frac{1}{2}^{60}, \frac{5}{8}^{70}, \frac{3}{4}^{80}, \frac{7}{8}^{90}$	35.00
1193	23	2 ³ / ₈	$\frac{1}{4}^{20}, \frac{5}{16}^{30}, \frac{3}{8}^{40}, \frac{7}{16}^{50}, \frac{1}{2}^{60}, \frac{5}{8}^{70}, \frac{3}{4}^{80}$	27.50
1207	23	2 ³ / ₈	$\frac{1}{4}^{20}, \frac{5}{16}^{30}, \frac{3}{8}^{40}, \frac{7}{16}^{50}, \frac{1}{2}^{60}, \frac{5}{8}^{70}, \frac{3}{4}^{80}$	30.75
1199	29	2 ³ / ₈	$\frac{1}{4}^{20}, \frac{5}{16}^{30}, \frac{3}{8}^{40}, \frac{7}{16}^{50}, \frac{1}{2}^{60}, \frac{5}{8}^{70}, \frac{3}{4}^{80}, \frac{7}{8}^{90}$	42.00
1204	18 and 29	2 ³ / ₁₆ and 2 ³ / ₈	$\frac{1}{4}^{20}, \frac{5}{16}^{30}, \frac{3}{8}^{40}, \frac{7}{16}^{50}, \frac{1}{2}^{60}, \frac{5}{8}^{70}, \frac{3}{4}^{80}, \frac{7}{8}^{90}, 1^{10}$	43.50
1200	53	4 ¹ / ₄	$\frac{3}{8}, 1, 1\frac{1}{8}, 1\frac{1}{4}, 1\frac{1}{2}, 1\frac{3}{4}$	70.00
1205	23 and 53	2 ³ / ₈ and 4 ¹ / ₄	$\frac{1}{4}^{20}, \frac{5}{16}^{30}, \frac{3}{8}^{40}, \frac{7}{16}^{50}, \frac{1}{2}^{60}, \frac{5}{8}^{70}, \frac{3}{4}^{80}, \frac{7}{8}^{90}, 1, 1\frac{1}{8}, 1\frac{1}{4}, 1\frac{1}{2}, 1\frac{3}{4}, 1\frac{5}{8}, 1\frac{7}{8}$	92.00

U. S. Standard Threads furnished unless otherwise ordered.

LIGHTNING ELASTIC STOCK FOR ABOVE SCREW PLATES



FIG. 2332

The Lightning Elastic Stock is furnished with all Lightning and Green River single stocked screw plates.

These Stocks are provided with an opening and closing device which firmly holds the collets when in use yet prevents their sticking and greatly facilitates their removal when necessary to change dies.

It is never necessary to drive a die out of the Lightning Elastic Stock or force a die in.

Stock No.	Price Each	For Die or Collet, Outside Diam., In.	Length Inches	Stock No.	Price Each	For Die or Collet, Outside Diam., In.	Length Inches
1800	\$1.00	$\frac{7}{8}$	6	1804	\$2.50	2 ³ / ₄	23
1801 ¹ / ₂	1.50	1 ¹ / ₂	15	1805	2.50	2 ³ / ₈	29
1802	2.50	2 ¹ / ₈	18	1806	4.00	2 ³ / ₄	35
1803	2.50	2 ¹ / ₂	22	1807	6.00	3 ¹ / ₈	50
1803 ¹ / ₂	2.50	2 ³ / ₈	29	1809	7.00	4 ¹ / ₄	53

LIGHTNING DIES AND COLLETS **FOR SCREW PLATES**



FIG. 2333



FIG. 2334

Size	Collets Without Dies Outside Diameter			Dies No. 1950		
	2 1/8" No. 1955	2 3/4" No. 1956	4 1/4" No. 1957	Outside Diam.	Thick-ness	Price
3/16	\$.50	\$.50		1 1/8	1/2	\$1.00
1/4	.50	.50		1 1/8	1/2	1.00
5/16	.50	.50		1 1/8	1/2	1.00
3/8	.50	.50		1 1/8	1/2	1.15
7/16	.50	.50		1 3/8	1/2	1.30
1/2	.50	.50		1 3/8	3/4	1.50
5/8		.50		1 3/8	5/8	1.60
3/4		.50		1 3/8	5/8	1.75
7/8		.50		2 1/8	3/4	1.90
1		.50		2 1/8	3/4	2.00
1 1/8		.50		2 1/8	3/4	2.25
1 1/4		.50	\$1.00	2 3/8	7/8	2.50
1 1/2		.50	1.00	2 3/8	1	2.75
1 3/4			1.00	2 3/8	1	3.00
2			1.00	2 3/8	1 1/8	3.50
2 1/4			1.00	2 3/4	1 1/4	4.00
2 1/2			1.00	2 3/4	1 3/4	4.50
2 3/4			1.00	2 3/4	1 1/2	5.00

2 3/8" Dia. Collets used in Screw Plates Nos. 2025, 1204.

2 3/4" Dia. Collets used in Screw Plates Nos. 1205, 1189, 1193, 1195, 1197, 1199, 1204.

4 1/4" Dia. Collets used in Screw Plates Nos. 1200, 1205.

HAND TAPS



FIG. 2335

Diam. in.	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2
Price ... each	\$.45	.50	.55	.60	.70	.80	.90	1.05	1.20	1.40	1.60	1.80	2.00	2.25

Diam. in.	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{7}{8}$	2	$2\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{3}{8}$	$2\frac{1}{2}$	
Price ... each	\$2.25	2.60	3.00	3.50	4.20	5.00	5.80	6.70	8.00	9.20	10.50	11.50

GREEN RIVER SCREW PLATES



FIG. 2336

No.	Length of Stock, Inches	Diam. of Collet, In.	One Taper Tap and One Die for Each Size	Price Per Set
1100	15	1 1/2	1/8 ¹⁰ , 3/16 ¹⁰ , 1/4 ²⁰ , 5/16 ¹⁸ , 3/8 ²⁰ , 7/16 ¹⁸ , 1/2 ¹⁰	20.50
1101	18	2 3/16	1/4 ²⁰ , 5/16 ¹⁸ , 3/8 ¹⁰ , 7/16 ¹⁸ , 1/2 ¹⁰	18.00
1124	22	2 3/16	1/4 ²⁰ , 3/8 ¹⁸ , 1/2 ¹⁰ , 5/8 ¹¹ , 3/4 ¹⁸	22.75
1104	22	2 3/16	1/4 ²⁰ , 5/16 ¹⁸ , 3/8 ¹⁰ , 7/16 ¹⁸ , 1/2 ¹¹ , 5/8 ¹¹ , 3/4 ¹⁶	27.50
1125	22	2 3/16	1/4 ²⁰ , 5/16 ¹⁸ , 3/8 ¹⁰ , 7/16 ¹⁸ , 1/2 ¹¹ , 5/8 ¹¹ , 3/4 ¹⁶	30.75
1108	29	2 3/4	1/2 ¹⁵ , 5/8 ¹¹ , 3/4 ¹⁸ , 7/8 ⁹ , 1 ⁸	29.25
1110	29	2 3/4	3/8 ¹⁰ , 7/16 ¹⁸ , 1/2 ¹¹ , 5/8 ¹¹ , 3/4 ¹⁰ , 7/8 ⁸ , 1 ⁸	35.00
1112	29	2 3/4	1/4 ²⁰ , 5/16 ¹⁸ , 3/8 ¹⁰ , 7/16 ¹⁸ , 1/2 ¹¹ , 5/8 ¹¹ , 3/4 ¹⁰ , 7/8 ⁸ , 1 ⁸	42.00
1114	15 1/2 and 29	1 1/2 and 2 3/4	1/4 ²⁰ , 5/16 ¹⁸ , 3/8 ¹⁰ , 7/16 ¹⁸ , 1/2 ¹¹ , 5/8 ¹¹ , 3/4 ¹⁰ , 7/8 ⁸ , 1 ⁸	43.50
1119	18 and 35	2 3/16 and 2 3/4	1/4 ²⁰ , 5/16 ¹⁸ , 3/8 ¹⁰ , 7/16 ¹⁸ , 1/2 ¹¹ , 5/8 ¹¹ , 3/4 ¹⁰ , 7/8 ⁸ , 1 ⁸ , 1 1/8 ⁷ , 1 1/4 ⁷	68.50
1116	50	3 5/16	3/8 ⁹ , 1 ⁸ , 1 1/8 ⁷ , 1 1/4 ⁷ , 1 3/8 ⁶ , 1 1/2 ⁶	70.00

U. S. Standard Threads furnished unless otherwise ordered.

GREEN RIVER ADJUSTABLE DIES



FIG. 2337

U. S. Std. threads furnished unless otherwise ordered.

Sizes, dimensions and threads not listed are subject to special prices. Left-hand dies are special.

We will furnish at regular prices Green River Dies from $\frac{1}{16}$ " to $\frac{3}{16}$ " $\frac{1}{16}$ " over-size and from $\frac{1}{4}$ " to $1\frac{1}{2}$ " inclusive $\frac{1}{32}$ " oversize in standard pitches only of V form.

Cutting Sizes	Diam., No. and Price of Die Only					Number of Threads per Inch			
						Standard Pitches		Also Furnished	
	$\frac{1}{16}$ Die No. 1960	$\frac{1}{8}$ Die No. 1961	$\frac{3}{16}$ Die No. 1962	$\frac{1}{2}$ Die No. 1963	$\frac{5}{8}$ Die No. 1964	S	S.A.E. Std.	Wht.	U. S. Form
$\frac{1}{16}$	\$1.00	.....	.....	.....	.....	64	Furnished in $\frac{1}{16}$ in. dia. die only.	60	72
$\frac{3}{32}$	1.00	.....	.....	.....	.....	60		..	72
$\frac{1}{8}$	1.00	.....	.....	.....	.....	50		48	48, 56
$\frac{3}{16}$	1.00	.....	.....	.....	.....	48		..	56
$\frac{1}{4}$	1.00	1.25	.....	.....	.....	40		40	32
$\frac{5}{16}$	1.00	1.25	.....	.....	.....	40		..	..
$\frac{3}{8}$	1.00	1.25	.....	.....	.....	36		32	32
$\frac{7}{16}$	1.00	1.25	.....	.....	.....	32		..	..
$\frac{1}{2}$	1.00	1.25	1.25	1.25	.....	24		24	30, 32
$\frac{5}{8}$	1.00	1.25	1.25	1.25	.....	24		..	..
$\frac{3}{4}$	1.00	1.25	1.25	1.25	.....	24		24	32
$\frac{7}{8}$	1.00	1.25	1.25	1.25	.....	24		..	..
$1\frac{1}{8}$	1.00	1.25	1.25	1.25	.....	20		20	24, 32
$1\frac{1}{4}$	1.00	1.25	1.25	1.25	.....	18		18	20, 32
$1\frac{3}{8}$	.....	1.25	1.50	1.50	.....	16		16	20
$1\frac{1}{2}$	.....	1.25	1.50	1.50	.....	14		14	24
$1\frac{5}{8}$	.....	.....	1.50	1.50	.....	13		12	12, 24
$1\frac{3}{4}$	.....	.....	1.60	1.60	.....	12		12	..
$1\frac{7}{8}$	.....	.....	1.75	1.75	.....	11		11	12
2	.....	.....	1.90	1.90	.....	11		11	..
$2\frac{1}{8}$	.....	.....	2.00	2.00	.....	10		10	12
$2\frac{1}{4}$	.....	.....	2.25	2.25	.....	10		10	..
$2\frac{3}{8}$	.....	.....	2.50	2.50	2.50	9	14, 18	9	12
$2\frac{1}{2}$	.....	.....	2.75	2.75	2.75	9	..	9	..
$2\frac{7}{8}$	.....	.....	3.00	3.00	3.00	8	14	8	12
3	.....	.....	.....	3.50	3.50	7	..	7	..
$3\frac{1}{8}$	.....	.....	.....	4.00	4.00	7	..	7	..
$3\frac{1}{4}$	.....	.....	.....	.....	4.50	6	..	6	..
$3\frac{3}{8}$	.....	.....	.....	.....	5.00	6	..	6	..

RANGE OF SIZES AND PRICE OF GUIDES

Die No.	Size	Range	Guide No.	Price Guide
1961	$1\frac{1}{2}$ Diam.	$\frac{1}{16}$ - $1\frac{1}{4}$	1971	\$0.25
1962	$2\frac{1}{8}$	$\frac{1}{16}$ -1	1972	.40
1963	$2\frac{3}{8}$	$\frac{1}{16}$ - $1\frac{1}{4}$	1973	.40
1964	$3\frac{1}{8}$	$\frac{1}{16}$ - $1\frac{1}{4}$	1974	.50

BLACKSMITHS' STOCKS AND DIES

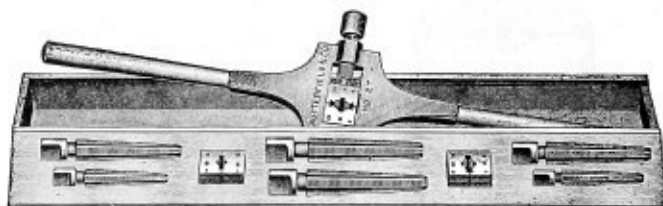


FIG. 2338

No.		Price Each
1	Cuts 2 in. to 1 in. Right Hand, $4\frac{1}{2}$ and 7 threads to inch. Cuts 2 in. to 1 in. Left Hand, $4\frac{1}{2}$ and 7 threads to inch. 8 Taps and 4 pairs of Dies.	\$60.00
2	Cuts 2 in. to $\frac{7}{8}$ in. Right Hand, $4\frac{1}{2}$, 6, 7 and 8 threads to inch. 8 Taps and 4 pairs of Dies.	60.00
3	Cuts $1\frac{3}{4}$ in. to $\frac{7}{8}$ in. Right Hand, 6 and 8 threads to inch. Cuts $1\frac{3}{4}$ in. to $\frac{7}{8}$ in. Left Hand, 6 and 8 threads to inch. 8 Taps and 4 pairs of Dies.	45.00
4	Cuts $1\frac{3}{4}$ in. to $\frac{3}{4}$ in. Right Hand, 6, 7, 8 and 9 threads to inch. 8 Taps and 4 pairs of Dies.	45.00
5	Cuts $1\frac{1}{2}$ in. to $\frac{3}{4}$ in. Right Hand, 8 and 9 threads to inch. Cuts $1\frac{1}{2}$ in. to $\frac{3}{4}$ in. Left Hand, 8 and 9 threads to inch. 8 Taps and 4 pairs of Dies.	35.00
$5\frac{1}{2}$	Cuts $1\frac{1}{2}$ in. to $\frac{3}{4}$ in. Right Hand, 6, 7, 8 and 9 threads to inch. 8 Taps and 4 pairs of Dies.	35.00
7	Cuts $1\frac{1}{4}$ in. to $\frac{3}{8}$ in. Right Hand, 8 and 10 threads to inch. Cuts $1\frac{1}{4}$ in. to $\frac{3}{8}$ in. Left Hand, 8 threads to inch. 6 Taps and 3 pairs of Dies.	12.00
9	Cuts $1\frac{1}{4}$ in. to $\frac{1}{2}$ in. Right Hand, 8, 10 and 12 threads to inch. 6 Taps and 3 pairs of Dies.	12.00
17	Cuts 1 in. to $\frac{1}{2}$ in. Right Hand, 9 and 12 threads to inch. Cuts 1 in. to $\frac{3}{4}$ in. Left Hand, 9 threads to inch. 6 Taps and 3 pairs of Dies.	9.00
19	Cuts 1 in. to $\frac{3}{8}$ in. Right Hand, 9, 12 and 14 threads to inch. 6 Taps and 3 pairs of Dies.	9.00
19A	Cuts 1 in. to $\frac{3}{8}$ in. Right Hand, 8, 10 and 12 threads to inch. 6 Taps and 3 pairs of Dies.	9.00
19B	Cuts 1 in. to $\frac{1}{2}$ in. Right Hand, 8, 9, 10 and 11 threads to in. 4 Taps and 4 pairs of Dies.	9.00
19C	Cuts 1 in. to $\frac{1}{4}$ in. Right Hand, 8, 9, 10, 11 and 12 threads to inch. 5 Taps and 5 pairs of Dies.	10.50
25	Cuts $\frac{3}{4}$ in. to $\frac{3}{8}$ in. Right Hand, 10 and 16 threads to inch. Cuts $\frac{3}{4}$ in. to $\frac{1}{2}$ in. Left Hand, 10 threads to inch. 6 Taps and 3 pairs of Dies.	6.50
27	Cuts $\frac{3}{4}$ in. to $\frac{3}{8}$ in. Right Hand, 10, 12 and 16 threads to inch. 6 Taps and 3 pairs of Dies.	6.50
27A	Cuts $\frac{3}{4}$ in. to $\frac{3}{8}$ in. Right Hand, 10, 11 and 12 threads to inch. 6 Taps and 3 pairs of Dies.	6.50
27B	Cuts $\frac{3}{4}$ in. to $\frac{1}{4}$ in. Right Hand, 10, 11, 12, 14 and 16 threads to in. 5 Taps and 5 pairs of Dies.	7.50

BLACKSMITHS' STOCKS AND DIES—CONTINUED

No.		Price Each
27C	Cuts $\frac{3}{8}$ in. to $\frac{1}{4}$ in. Right Hand, 10, 11, 12, 14, 16 and 18 threads to in. 6 Taps and 6 pairs of Dies.	\$8.50
27D	Cuts $\frac{3}{8}$ in. to $\frac{5}{16}$ in. Right Hand, 10, 11, 12, 14, 16, 18 and 20 thread to inch. 7 Taps and 7 pairs of dies.	9.50
45	Cuts $\frac{5}{8}$ in. to $\frac{3}{16}$ in. Right Hand, 12 and 16 threads to inch. Cuts $\frac{5}{8}$ in. to $\frac{1}{16}$ in. Left Hand, 12 threads to inch. 6 Taps and 3 pairs of Dies.	5.50
47	Cuts $\frac{5}{8}$ in. to $\frac{1}{4}$ in. Right Hand, 12, 14 and 18 threads to inch. 6 Taps and 3 pairs of Dies.	5.50
47A	Cuts $\frac{5}{8}$ in. to $\frac{3}{8}$ in. Right Hand, 11, 12 and 14 threads to inch. 3 Taps and 3 pairs of Dies.	5.00
47B	Cuts $\frac{5}{8}$ in. to $\frac{1}{4}$ in. Right Hand, 11, 12, 14 and 16 threads to inch. 4 taps and 4 pairs of Dies.	5.50
49	Cuts $\frac{1}{2}$ in. to $\frac{1}{4}$ in. Right Hand, 14 and 18 threads to inch. Cuts $\frac{1}{2}$ in. to $\frac{1}{16}$ in. Left Hand, 14 threads to inch. 6 Taps and 3 pairs of Dies.	4.50
51	Cuts $\frac{1}{2}$ in. to $\frac{3}{16}$ in. Right Hand, 14, 18 and 22 threads to inch. 6 Taps and 3 pairs of Dies.	4.50
51A	Cuts $\frac{1}{2}$ in. to $\frac{1}{4}$ in. Right Hand, 12, 14 and 16 threads to inch. 3 Taps and 3 pairs of Dies.	4.00
51B	Cuts $\frac{1}{2}$ in. to $\frac{3}{16}$ in. Right Hand, 12, 14, 16 and 18 threads to inch. 4 Taps and 4 pairs of Dies.	4.50



FIG. 2339

6	Cuts $1\frac{1}{2}$ in. to 1 in. Right Hand, 8 threads to inch. Cuts $1\frac{1}{2}$ in. to 1 in. Left Hand, 8 threads to inch. 4 Taps and 2 sets of Dies.	20.00
11	Cuts $1\frac{1}{4}$ in. to $\frac{5}{8}$ in. Right Hand, 8 and 10 threads to inch. Cuts $1\frac{1}{4}$ in. to $\frac{3}{8}$ in. Left Hand, 8 threads to inch. 4 Taps and 3 sets of Dies.	10.00
15	Cuts $1\frac{1}{4}$ in. to $\frac{1}{2}$ in. Right Hand, 8, 10 and 12 threads to inch. 5 Taps and 3 sets of Dies.	10.00
21	Cuts 1 in. to $\frac{1}{2}$ in. Right Hand, 9 and 12 threads to inch. Cuts 1 in. to $\frac{3}{4}$ in. Left Hand, 9 threads to inch. 4 Taps and 3 sets of Dies.	6.00
23	Cuts 1 in. to $\frac{3}{8}$ in. Right Hand, 9, 10 and 14 threads to inch. 3 Taps and 3 sets of Dies.	5.00
23A	Cuts 1 in. to $\frac{3}{8}$ in. Right Hand, 8, 10, and 12 threads to inch. 3 Taps and 3 sets of Dies.	5.00
23B	Cuts 1 in. to $\frac{1}{2}$ in. Right Hand, 8, 10 and 11 threads to inch. 3 Taps and 3 sets of Dies.	5.00
32	Cuts $\frac{3}{4}$ in. to $\frac{3}{8}$ in. Right Hand, 10 and 14 threads to inch. Cuts $\frac{3}{4}$ in. to $\frac{3}{8}$ in. Left Hand, 10 and 14 threads to inch. 4 Taps and 4 sets of Dies.	5.00
32A	Cuts $\frac{3}{4}$ in. to $\frac{3}{8}$ in. Right Hand, 10, 11, 12 and 14 threads to inch. 4 Taps and 4 sets of Dies.	5.00

BLACKSMITHS' STOCKS AND DIES—CONTINUED

No.		Price Each
32B	Cuts $\frac{3}{8}$ in. to $\frac{1}{4}$ in. Right Hand, 10, 12, 14 and 16 threads to inch. 4 Taps and 4 sets of Dies.	\$5.00
34	Cuts $\frac{3}{8}$ in. to $\frac{5}{16}$ in. Right Hand, 10, 12 and 16 threads to inch. 3 Taps and 3 sets of Dies.	4.50
34A	Cuts $\frac{3}{8}$ in. to $\frac{5}{16}$ in. Right Hand, 10, 12 and 14 threads to inch. 3 Taps and 3 sets of Dies.	4.50
34B	Cuts $\frac{3}{8}$ in. to $\frac{5}{16}$ in. Right Hand, 12, 14 and 16 threads to inch. 3 Taps and 3 sets of Dies.	4.50
34C	Cuts $\frac{3}{8}$ in. to $\frac{5}{16}$ in. Right Hand, 10, 11 and 12 threads to inch. 3 Taps and 3 sets of Dies.	4.50
35	Cuts $\frac{3}{8}$ in. to $\frac{5}{16}$ in. Right Hand, 10 and 14 threads to inch. 2 Taps and 2 sets of Dies.	4.00
37	Cuts $\frac{5}{8}$ in. to $\frac{3}{4}$ in. Right Hand, 14, 18 and 22 threads to inch. 6 Taps and 3 sets of Dies.	4.25
37A	Cuts $\frac{5}{8}$ in. to $\frac{3}{4}$ in. Right Hand, 12, 14 and 16 threads to inch. 6 Taps and 3 sets of Dies.	4.25
37B	Cuts $\frac{5}{8}$ in. to $\frac{3}{4}$ in. Right Hand, 14, 16 and 18 threads to inch. 6 Taps and 3 sets of Dies.	4.25
37C	Cuts $\frac{5}{8}$ in. to $\frac{3}{4}$ in. Right Hand, 11, 12 and 16 threads to inch. 6 Taps and 3 sets of Dies.	4.25
38	Cuts $\frac{5}{8}$ in. to $\frac{3}{4}$ in. Right Hand, 12 and 18 threads to inch. Cuts $\frac{5}{8}$ in. to $\frac{3}{4}$ in. Left Hand, 12 threads to inch. 6 Taps and 3 sets of Dies.	4.50
41	Cuts $\frac{1}{2}$ in. to $\frac{1}{4}$ in. Right Hand, 16, 20 and 26 threads to inch. 6 Taps and 3 sets of Dies.	3.25
41A	Cuts $\frac{1}{2}$ in. to $\frac{1}{4}$ in. Right Hand, 14, 16 and 18 threads to inch. 6 Taps and 3 sets of Dies.	3.25
41B	Cuts $\frac{1}{2}$ in. to $\frac{1}{4}$ in. Right Hand, 16, 18 and 20 threads to inch. 6 Taps and 3 sets of Dies.	3.25
41C	Cuts $\frac{1}{2}$ in. to $\frac{3}{8}$ in. Right Hand, 12, 14 and 16 threads to inch. 6 Taps and 3 sets of Dies.	3.25
41D	Cuts $\frac{1}{2}$ in. to $\frac{3}{8}$ in. Right Hand, 12, 16 and 20 threads to inch. 6 Taps and 3 sets of Dies.	3.25
41E	Cuts $\frac{1}{2}$ in. to $\frac{3}{8}$ in. Right Hand, 12, 14 and 18 threads to inch. 6 Taps and 3 sets of Dies.	3.25
42	Cuts $\frac{1}{2}$ in. to $\frac{3}{8}$ in. Right Hand, 14 and 20 threads to inch. Cuts $\frac{1}{2}$ in. to $\frac{3}{8}$ in. Left Hand, 14 threads to inch. 6 Taps and 3 sets of Dies.	3.50
42A	Cuts $\frac{1}{2}$ in. to $\frac{3}{8}$ in. Right Hand, 12 and 18 threads to inch. Cuts $\frac{1}{2}$ in. to $\frac{3}{8}$ in. Left Hand, 12 threads to inch. 6 Taps and 3 sets of Dies.	3.50
53	Cuts $\frac{7}{16}$ in. to $\frac{1}{2}$ in. Right Hand, 16, 20, 24 and 32 threads to inch. 4 Taps and 4 sets of Dies.	2.75
53A	Cuts $\frac{7}{16}$ in. to $\frac{1}{2}$ in. Right Hand, 18, 20, 24 and 32 threads to inch. 4 Taps and 4 sets of Dies.	2.75
55	Cuts $\frac{7}{16}$ in. to $\frac{1}{2}$ in. Right Hand, 18, 24 and 32 threads to inch. 4 Taps and 3 sets of Dies.	2.50
60	Cuts $\frac{3}{4}$ in. to $\frac{1}{2}$ in. Right Hand, 10, 12 14 and 18 threads to inch. 6 Taps and 4 sets of Dies.	6.50

HOLLANDS' MALLEABLE HINGED PIPE VISES

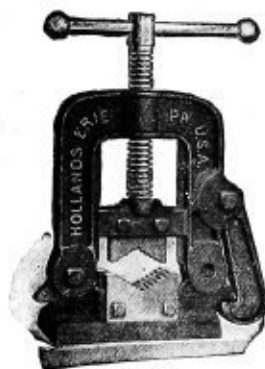


FIG. 2340

Screws are one-piece steel turned from solid bars and have acme thread, giving maximum strength and rapidity of action.

Pipe jaws are tool steel milled from solid bars and oil tempered.

The base is flat with all bracing flanges underneath, making it convenient to use a wrench in fastening with lag screws or bolts.

No.	Pipe Capacity	Weight	List Price Each
412	$\frac{1}{8}$ to $2\frac{1}{2}$ in.	12 lbs.	\$ 5.00
403	$\frac{1}{8}$ to $3\frac{1}{2}$ in.	18 lbs.	7.50
404	$\frac{1}{8}$ to $4\frac{1}{2}$ in.	24 lbs.	11.00
406	$\frac{1}{8}$ to 6 in.	55 lbs.	23.50
408	1 to 8 in.	80 lbs.	47.50

REED PIPE VISES

Extra Heavy Vise,
Nos. 61 to 66, Inclusive

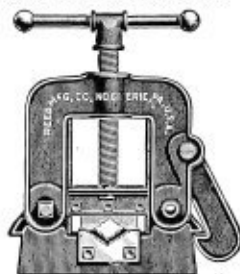


FIG. 2341

Standard Vise
Nos. 7000 to 73, Inclusive

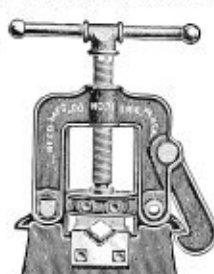


FIG. 2342

Vise No.	List Price	Holds Pipe, Inches	List Price, Per Set (3)
61	\$ 6.00	$\frac{1}{8}$ to $2\frac{1}{2}$	\$ 1.75
62	9.00	$\frac{1}{8}$ to $3\frac{1}{2}$	2.50
63	12.50	$\frac{1}{8}$ to $4\frac{1}{2}$	3.50
64	23.50	$\frac{1}{8}$ to 6	6.00
65	47.50	1 to 8	8.50
66	70.00	$1\frac{1}{2}$ to 12	13.50
7000	2.50	$\frac{1}{8}$ to $1\frac{1}{4}$	1.20
700	3.60	$\frac{1}{8}$ to $1\frac{1}{2}$	1.40
70	4.25	$\frac{1}{8}$ to 2	1.75
71	5.00	$\frac{1}{8}$ to $2\frac{1}{2}$	1.75
72	7.50	$\frac{1}{8}$ to $3\frac{1}{2}$	2.50
73	11.00	$\frac{1}{8}$ to $4\frac{1}{2}$	3.50

SAUNDERS MALLEABLE PIPE VISES

Nos. 1 & 2

Nos. 3, 4, 5 and 6



FIG. 2343



FIG. 2344

No.	1	2	3	4	5	6
Holds pipe	ins. $\frac{1}{4}$ to 2	$\frac{1}{4}$ to 3	$\frac{1}{2}$ to 4	2 to 6	$2\frac{1}{2}$ to 8	4 to 12
Price	each \$10.00	13.00	24.00	30.00	45.00	70.00

ARMSTRONG HINGED PIPE VISES



FIG. 2345

No.	Junior	0	1	2	3
Holds pipe	ins. $\frac{1}{4}$ to $1\frac{1}{4}$	$\frac{1}{8}$ to $2\frac{1}{2}$	$\frac{1}{4}$ to $2\frac{1}{2}$	$\frac{1}{2}$ to $4\frac{1}{2}$	1 to 6
Price	each \$2.50	5.00	6.00	12.50	23.50

"VULCAN" DROP FORGED CHAIN PIPE VISE

These vises are unbreakable, compact, rapid in action and positive in gripping pipe.

For holding pipe, bolts, bars, shafts, etc., from $\frac{1}{8}$ to 4 inches diameter.

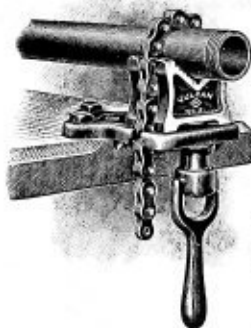


FIG. 2346

Number	Capacity, Pipe Sizes, Inches	Complete Vise	Jaws, Pair	Chain and Screw	Screw	Handle and Nut	Nut
1	$\frac{1}{8}$ to 2	\$3.50	1.50	1.25	.40	1.10	.70
2	$\frac{1}{4}$ to 4	7.50	3.50	2.40	.70	2.10	1.35
4	$\frac{3}{4}$ to 8	18.00	9.00	6.00	1.25	3.50	2.00

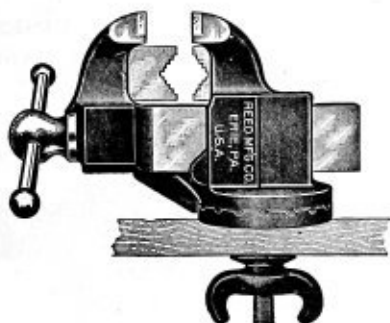


FIG. 2347

REED COMBINATION PIPE VISE

No.	Width Jaw, Inches	Weight, Lbs.	Capacity Pipe, Inches	List Price, Each	List Price, Set (3)
31	3 1/8	46	1/8 to 2 1/2	\$16.00	\$1.25
32	4 1/4	72	1/8 to 3 1/2	22.00	1.50
33	5	119	1/8 to 4 1/2	32.00	1.75
34	6	178	1/8 to 6	45.00	2.50

ATHOL COMBINATION PIPE VISES

Stationary Base Nos. 145, 147 and 149

Swivel Base Nos. 144, 146 and 148

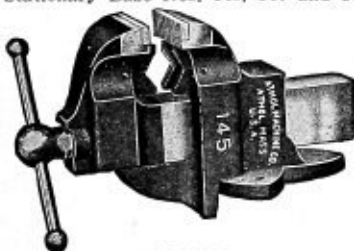


FIG. 2348

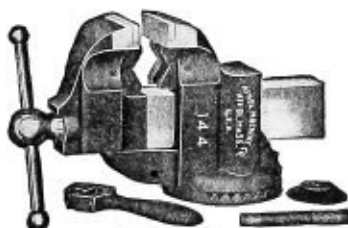


FIG. 2349

No.	No.	Width Jaws	Jaws Open	Capacity Pipe, Inches	Price, Either Style		Weight Stationary Base Lbs.	Weight Swivel Base Lbs.
Stationary Base	Swivel Base				Vises Each	Jaws Set (3)		
145	144	3 3/4 in.	5 in.	1/8 to 2 1/2 in.	\$16.00	\$1.25	43	48 1/2
147	146	4 1/2 in.	6 in.	1/8 to 3 1/2 in.	22.00	1.50	60	70
149	148	5 1/2 in.	7 in.	1/4 to 4 in.	32.00	1.75	93	100

COLUMBIAN MALLEABLE COMBINATION PIPE VISE SWIVEL BASE

The front pipe jaw is reversible, so that it can be turned if desired. This means practically two sets of jaws.

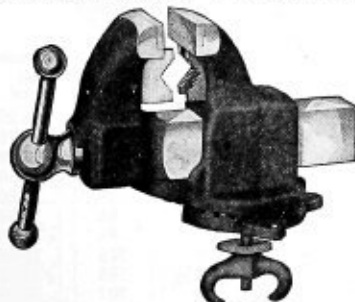


FIG. 2350

Vise No.	Width Jaw Inches	Holds Pipe, Inches	Jaws Open Inches	Weight Pounds	List Price	Jaws Per Set List Price
203 1/2	3 1/2	1/8 to 2 1/2	4	46	\$16.00	\$1.50
204 1/2	4 1/2	1/8 to 3 1/2	5	72	22.00	1.75
205	5	1/8 to 4 1/2	6 1/4	119	32.00	2.00
206	6	1/8 to 6	8 1/4	178	45.00	3.00

COLUMBIAN MALLEABLE IRON MACHINISTS' VISES

SOMETHING NEW. ENTIRE VISE EXCEPT SCREW AND HANDLE MADE OF MALLEABLE IRON. PRACTICALLY INDESTRUCTIBLE

Series 500—Solid Jaw
Stationary Base

FIG. 2351

Series 600—Solid Jaw
Swivel Base

FIG. 2352

Vise No.	Width Jaw Inches	Jaws Open Inches	Depth Opening Jaws Inches	Weight Pounds	List Price
502	2	3	2	9	\$4.75
502½	2½	3½	2½	13	5.25
503	3	4½	2½	20	6.00
503½	3½	5	2¾	27	7.00
504	4	6	2¾	36	8.50
504½	4½	7	3½	46	10.00
505	5	8	4	58	13.00
505½	5½	9	4	75	18.50
506	6	10	4½	82	25.00
507	7	12	5½	116	37.50
508	8	13	5½	150	50.00

Vise No.	Width Jaw Inches	Jaws Open Inches	Depth Opening Jaws Inches	Weight Pounds	List Price
602	2	3	2	12	\$5.75
602½	2½	3½	2¾	17	6.50
603	3	4½	2½	25	7.50
603½	3½	5	2¾	35	8.75
604	4	6	2¾	44	10.50
604½	4½	7	3½	56	12.50
605	5	8	4	74	16.00
605½	5½	9	4	86	22.00
606	6	10	4½	90	30.00
607	7	12	5½	126	42.50
608	8	13	5½	165	55.00

Series 300—Swivel Jaw
Stationary Base

FIG. 2353

Series 400—Swivel Jaw
Swivel Base

FIG. 2354

Vise No.	Width Jaw Inches	Jaws Open Inches	Weight Pounds	List Price
302	2	2½	13	\$ 5.00
302½	2½	3	17	5.50
303	3	4	24	6.25
303½	3½	4¾	28	7.00
304	4	5½	41	9.00
304½	4½	6	54	10.50
305	5	7½	78	14.00
305½	5½	9	110	17.00
306	6	9½	146	24.00
307	7	11	184	30.00
308	8	12	270	40.00

Vise No.	Width Jaw Inches	Jaws Open Inches	Weight Pounds	List Price
402	2	2½	15	\$ 6.25
402½	2½	3	20	6.75
403	3	4	26	7.50
403½	3½	4¾	32	8.50
404	4	5½	46	10.50
404½	4½	6	65	12.50
405	5	7½	90	16.00
405½	5½	9	118	19.00
406	6	9½	168	27.00
407	7	11	207	35.00
408	8	12	300	45.00

REED MACHINISTS' VISES

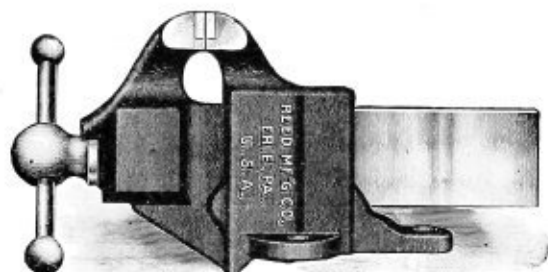


FIG. 2355

SOLID JAW STATIONARY BASE VISE

No.	Width Jaw, Inches	Opens, Inches	Weight, Pounds	List Price	No.	Width Jaw, Inches	Opens, Inches	Weight, Pounds	List Price
102	2	3	10½	\$4.75	105	5	8	71	\$13.00
102½	2½	3½	14	5.25	105½	5½	9	105	18.50
103	3	4	20	6.00	106	6	10	128	25.00
103½	3½	5	29	7.00	107	7	12	174	37.50
104	4	6	41	8.50	108	8	12	248	50.00
104½	4½	7	54	10.00	109	9	13	290	62.50

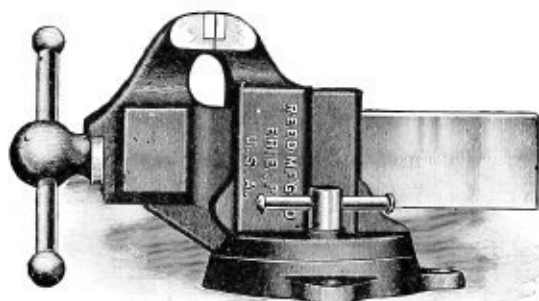


FIG. 2356

SOLID JAW SWIVEL BASE VISE

No.	Width Jaw, Inches	Opens, Inches	Weight, Pounds	List Price	No.	Width Jaw, Inches	Opens, Inches	Weight, Pounds	List Price
202	2	3	12½	\$5.75	205	5	8	87	\$16.00
202½	2½	3½	18	6.50	205½	5½	9	118	22.00
203	3	4	28	7.50	206	6	10	147	30.00
203½	3½	5	36	8.75	207	7	12	203	42.50
204	4	6	49	10.50	208	8	12	278	55.00
204½	4½	7	64	12.50	209	9	13	324	67.50

REED MACHINISTS' VISES

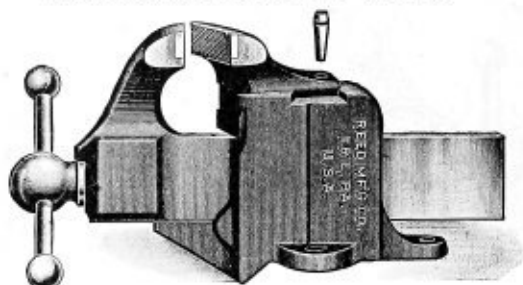


FIG. 2357

SWIVEL JAW STATIONARY BASE VISE

Number	Width Jaw, Inches	Opens, Inches	Weight, Pounds	List Price
302	2	2½	13	\$5.00
302½	2½	3	17	5.50
303	3	3½	25	6.25
303½	3½	4	34	7.00
304	4	4¾	48	9.00
304½	4½	5½	64	10.50
305	5	6½	82	14.00
305½	5½	7¾	116	17.00
306	6	9	141	24.00
307	7	11½	198	30.00
308	8	12	273	40.00

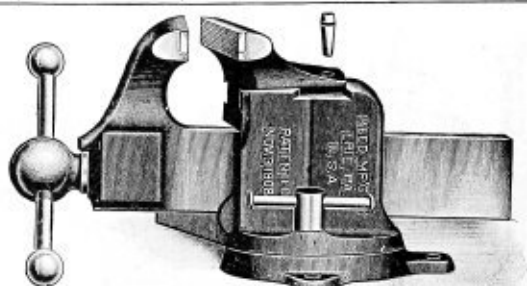


FIG. 2358

SWIVEL JAW SWIVEL BASE VISE

Number	Width Jaw, Inches	Opens, Inches	Weight, Pounds	List Price
402	2	2½	15	\$6.25
402½	2½	3	20	6.75
403	3	3½	30	7.50
403½	3½	4	41	8.50
404	4	4¾	56	10.50
404½	4½	5½	72	12.50
405	5	6½	98	16.00
405½	5½	7¾	138	19.00
406	6	9	157	27.00
407	7	11½	218	35.00
408	8	12	300	45.00

STARRETT'S IMPROVED MACHINISTS' VISES WITH PATENT ADJUSTABLE HANDLE



FIG. 2359

Stationary Base

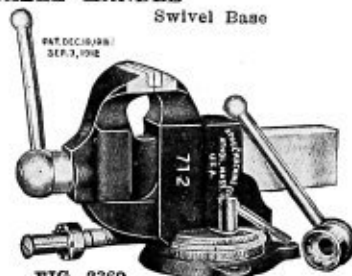


FIG. 2360

Swivel Base

No.	Width Jaws	Jaws Open	Weight	Price	No.	Width Jaws	Jaws Open	Weight	Price
705	2½ in.	2 in.	6 lbs.	\$4.75	704	2½ in.	2 in.	7½ lbs.	\$5.75
707	2½ in.	2¾ in.	10 lbs.	5.25	706	2½ in.	2¾ in.	11½ lbs.	6.50
709	3 in.	3½ in.	16½ lbs.	6.00	708	3 in.	3½ in.	19 lbs.	7.50
711	3½ in.	4 in.	27 lbs.	7.00	710	3½ in.	4 in.	31 lbs.	8.75
713	4 in.	5 in.	40 lbs.	8.50	712	4 in.	5 in.	49 lbs.	10.50
715	4½ in.	6 in.	54 lbs.	10.00	714	4½ in.	6 in.	66 lbs.	12.50
717	5 in.	7 in.	68 lbs.	13.00	716	5 in.	7 in.	85 lbs.	16.00
719	5½ in.	9½ in.	97 lbs.	18.50	718	5½ in.	9½ in.	112 lbs.	22.00
721	6 in.	10½ in.	135 lbs.	25.00	720	6 in.	10½ in.	155 lbs.	30.00

No. 705 has smooth-faced, tempered steel jaws. Other numbers will be furnished with check jaws unless smooth jaws are specified.

No. 704 has smooth-faced, tempered steel jaws. Other numbers will be furnished with check jaws unless smooth jaws are specified.

STARRETT'S MACHINISTS' SWIVEL JAW VISES WITH PATENT ADJUSTABLE HANDLES



FIG. 2361

Stationary Base

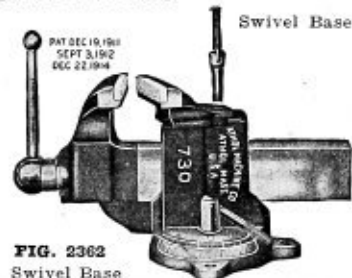


FIG. 2362

Swivel Base

No.	Width Jaws	Jaws Open	Weight	Price	No.	Width Jaws	Jaws Open	Weight	Price
725	2½ in.	3½ in.	17 lbs.	\$7.00	724	2½ in.	3½ in.	18 lbs.	\$8.50
727	3 in.	4 in.	21 lbs.	8.00	726	3 in.	4 in.	23 lbs.	9.50
729	3½ in.	5 in.	31 lbs.	9.00	728	3½ in.	5 in.	36 lbs.	10.75
731	4 in.	6 in.	42 lbs.	11.25	730	4 in.	6 in.	49 lbs.	13.25
733	4½ in.	7 in.	57 lbs.	13.25	732	4½ in.	7 in.	68 lbs.	15.75
735	5 in.	8 in.	74 lbs.	17.50	734	5 in.	8 in.	87 lbs.	20.00
737	5½ in.	9 in.	93 lbs.	21.25	736	5½ in.	9 in.	108 lbs.	23.75

Check-faced, tempered steel jaws will be furnished unless smooth-faced jaws are specified.

ATHOL MACHINISTS' VISES

Swivel Base

SWIVEL BASE

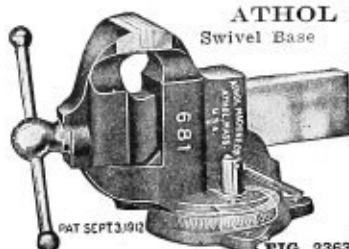


FIG. 2363

Vise No.	Width Jaw	Jaws Open	Weight	Price
677	2 1/8 in.	2 in.	7 1/2 lbs.	\$5.75
678	2 1/2 in.	2 3/4 in.	11 1/2 lbs.	6.50
679	3 in.	3 1/2 in.	18 1/2 lbs.	7.50
680	3 1/2 in.	4 in.	30 1/2 lbs.	8.75
681	4 in.	5 in.	48 lbs.	10.50
682	4 1/2 in.	6 in.	64 1/2 lbs.	12.50
683	5 in.	7 in.	83 1/2 lbs.	16.00

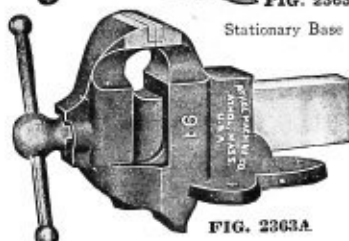


FIG. 2363A

STATIONARY BASE

87	2 1/8 in.	2 in.	5 1/2 lbs.	\$4.75
88	2 1/2 in.	2 3/4 in.	9 lbs.	5.25
89	3 in.	3 1/2 in.	16 lbs.	6.00
90	3 1/2 in.	4 in.	26 1/2 lbs.	7.00
91	4 in.	5 in.	38 lbs.	8.50
92	4 1/2 in.	6 in.	50 lbs.	10.00
93	5 in.	7 in.	65 lbs.	13.00
94	5 1/2 in.	8 in.	100 lbs.	18.50
95	6 in.	9 in.	135 lbs.	25.00
96	7 in.	10 1/2 in.	190 lbs.	30.00
97	8 in.	12 1/2 in.	260 lbs.	50.00

Stationary Base

PAT. SEPT. 13/12
DEC. 22/14

Swivel Base



FIG. 2364

ATHOL MACHINISTS' VISES

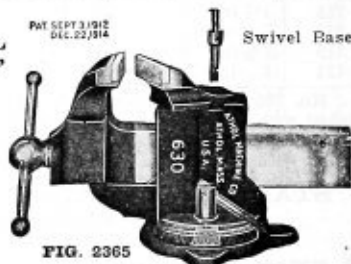


FIG. 2365

STATIONARY BASE

SWIVEL BASE

Number	Width Jaw	Jaws Open	Weight	Price	Number	Width Jaw	Jaws Open	Weight	Price
625	2 1/8 in.	3 1/2 in.	17 lbs.	\$5.50	624	2 1/8 in.	3 1/2 in.	18 lbs.	\$6.75
627	3 in.	4 in.	21 lbs.	6.25	626	3 in.	4 in.	23 lbs.	7.50
629	3 1/2 in.	5 in.	30 lbs.	7.00	628	3 1/2 in.	5 in.	35 lbs.	8.50
631	4 in.	6 in.	41 lbs.	9.00	630	4 in.	6 in.	48 lbs.	10.50
633	4 1/2 in.	7 in.	57 lbs.	10.50	632	4 1/2 in.	7 in.	68 lbs.	12.50
635	5 in.	8 in.	74 lbs.	14.00	634	5 in.	8 in.	87 lbs.	16.00
637	5 1/2 in.	9 in.	93 lbs.	17.00	636	5 1/2 in.	9 in.	108 lbs.	19.00

ATHOL PIPE GRIPS—SWIVEL JAWS

No. 150A. Fits any 3 to 4 1/2 in. Machinist's Vise. Will hold 1/4 to 2 1/2 in. pipe.

Price\$2.50

No. 150B. Fits any 4 3/4 to 5 1/2 in. Machinist's Vise. Will hold 1/4 to 5 in. pipe.

Price\$2.75

No. 150C. Fits any 6 to 8 1/2 in. Machinist's Vise. Will hold 1/4 to 6 in. pipe.

Price\$3.00



FIG. 2366

PRENTISS' PATENT SELF-ADJUSTING JAW VISES

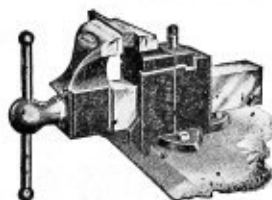


FIG. 2367

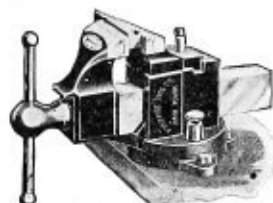


FIG. 2368

MACHINISTS'
STATIONARY BOTTOM VISESMACHINISTS'
PATENT SWIVEL BOTTOM VISES

No.	Width Jaw	Opens	Weight	List Price	No.	Width Jaw	Opens	Weight	List Price
1	2½ in.	3½ in.	13½ lbs.	\$5.50	18	2½ in.	3½ in.	17 lbs.	\$6.75
2	3½ in.	4¾ in.	28 lbs.	7.00	19	3½ in.	4¾ in.	32 lbs.	8.50
2½	4 in.	5¼ in.	41 lbs.	9.00	19½	4 in.	5¼ in.	46 lbs.	10.50
3	4½ in.	6 in.	54 lbs.	10.50	20	4½ in.	6 in.	65 lbs.	12.50
4	5½ in.	8 in.	96 lbs.	17.00	21	5½ in.	8 in.	109 lbs.	19.00
5	6 in.	9 in.	146 lbs.	24.00	22	6 in.	9 in.	168 lbs.	27.00
6	7 in.	11 in.	184 lbs.	30.00	23	7 in.	11 in.	207 lbs.	35.00

SHEPARD NEW VISES
STATIONARY AND SWIVEL BASES

Jaws Inches	Opens Inches	Stationary			Swivel		
		No.	Wt. lbs.	Price	No.	Wt. lbs.	Price
2	2	158	2½	\$0.75	159	3	\$1.00
2	2	160	4	1.50	60	5½	1.65
2½	3	161	10	2.00	61	12	2.25
3	3½	161½	12	2.40	61½	14	2.65
3½	4	162	16	2.75	62	18	3.00
4	6	163	30	4.00	63	32	4.50
4½	7½	164	44	6.00	64	48	6.75

Stationary Base



FIG. 2369

Stationary Base



FIG. 2370

SHEPARD
WOOD WORKERS' VISES

Jaws, Inches	Opens, Inches	Stationary			Swivel		
		No.	Wt. lbs.	Price	No.	Wt. lbs.	Price
3½	7	168	33	\$5.25	169	38	\$6.00
4½	9	68	42	6.25	69	46	7.25

A good Tool at a moderate cost.

REED WOOD WORKERS' VISES

GUARANTEED

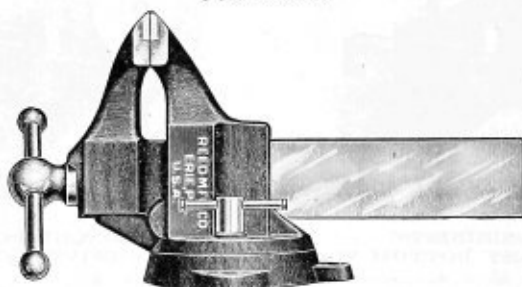


FIG. 2371

STATIONARY JAW VISE

No.	Style of Base	Width Jaw, Inches	Opens, Inches	Weight, Pounds	List Price
124	Stationary	4	7	46	\$ 8.50
124½	Stationary	4½	11	60	10.00
224	Swivel	4	7	52	10.50
224½	Swivel	4½	11	65	12.50

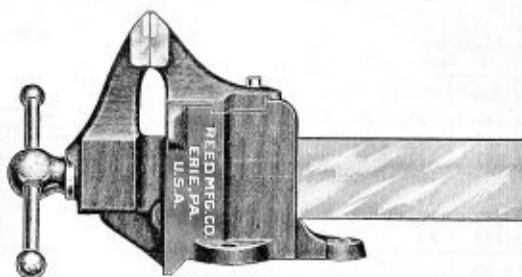


FIG. 2372

SWIVEL JAW VISE

No.	Style of Base	Width Jaw, Inches	Opens, Inches	Weight, Pounds	List Price
324	Stationary	4	6¼	50	\$ 9.00
324½	Stationary	4½	10	66	10.50
424	Swivel	4	6¼	60	10.50
424½	Swivel	4½	10	75	12.50

Both of the above vises can be furnished with either a stationary or a swivel base. The upper cut shows the style of the swivel base and the lower cut shows the style of the stationary base.

EMMERT UNIVERSAL VISES

THE STANDARD VISE FOR TOOL MAKERS, MACHINISTS, METAL PATTERN MAKERS, DIE SINKERS, ETC.

Natural Position

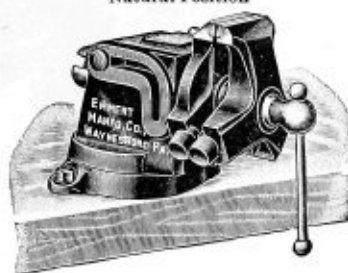


FIG. 2273

Loose Position to Hold Wedge or Tapered Shaped Pieces



FIG. 2274

These Vises are supplied with five pairs of holding jaws so arranged as to hold all kinds of work within the jaw capacity and in any possible position to suit the convenience of the operator.

This is positively the only Vise made having more than one jaw on the main stem or beam and at the same time having a Triple Swivel movement.

Vise No.	Size of Jaw, Inches	Open, Inches	Weight, Pounds	Net Price
4a	4	6	100	\$25.00
6a	3	5	55	20.00

EMMERT UNIVERSAL VISES

FOR WOOD WORKERS AND PATTERN MAKERS

Vise Holding Odd-Shaped Work in a Form at an Angle



FIG. 2275

Vise Reversed to Hold Work Above the Bench



FIG. 2276

Another Very Useful and Convenient Position



FIG. 2277

These Vises are supplied with seven pairs of jaws adopted to grasp any kind of work regardless of irregularity of form.

Vise No.	Size of Jaws, Inches	Opens, Inches	Weight, Pounds	Price
1	7 x 18½	14	86	\$25.00
2	5 x 14	12	56	22.50

SHEPARD TABLE CLAMP VISES

No.	Jaws Inches	Opens, Inches	Weight lbs.	Price
152	1½	1½	1½	\$0.50
153	1¾	1¾	2½	.75
154	2	2	3	.95
155	2¼	2½	5½	1.25
156	2¾	3½	9	1.75

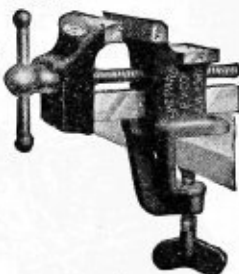


FIG. 2378

CHENEY'S COMBINED ANVIL AND VISE

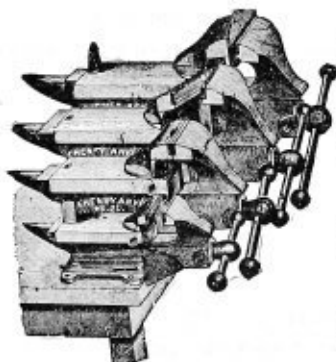


FIG. 2379

No. 10. Weight, about 9 lbs.; jaws, about 2½ in. wide, opens 3 inches.

Priceeach, \$3.50

No. 20. Weight, about 25 lbs.; jaws, about 3¼ in. wide, opens 4 inches.

Priceeach, \$4.50

No. 30. Weight, about 35 lbs.; jaws, about 3¾ in. wide, opens 5 inches.

Priceeach, \$5.50

No. 40. Weight, about 50 lbs.; jaws, about 4¼ in. wide, opens 5 inches.

Priceeach, \$6.50

No. 10. The smallest size is shown, the jaws partially extended. It is adapted for use of Jewelers, Amateurs, Boys, or anyone who wishes a small, strong and convenient tool. Face of Anvil, 4½x3 inches.

No. 20 is shown with the jaws closed. This size is especially the Householders' favorite, and is useful to make such repairs as are constantly needed about every house. Face of Anvil, 6½x3 inches.

No. 30 is shown with jaws adjusted to hold a wedge. Face of Anvil, 8x3½ inches. For general use among Mechanics and Farmers who wish a strong, durable tool, and not too heavy, this size is especially adapted.

No. 40 is the largest size made. Face of Anvil, 8½x4 inches. This size is used by Mechanics, Miners, Planters, and others who have need of an extra strong, heavy tool.

YOST DRILL PRESS VISE

No.	Width Jaw, In.	Opens, Inches	Weight, Lbs.	List Price
1D	3½	3½	12½	\$5.20
2D	5	5½	23	\$8.50



FIG. 2380

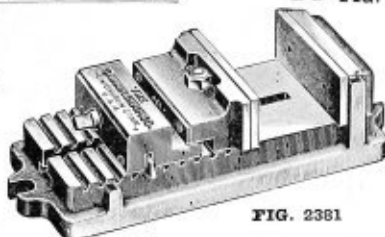
SKINNER
DRILL
PRESS
VISE

FIG. 2381

Size No.	Width Jaw	Depth Jaw	Jaw Open	Weight Lbs.	Space Required	List Price
2½	2½	1	2½	4½	6x2½	\$10.00
3½	3½	1½	4½	12	9½x4½	12.00
4½	4½	2	5	37	14x5½	15.00
5½	5½	2	6	43	15x6	18.00
7½	7½	2½	9	98	19½x9	30.00



FIG. 2382

SOLID BOX VISES

No.	Size of Jaw, Inches	List Price, Each	No.	Size of Jaw, Inches	List Price, Each
25	3¾	\$12.00	105	6	\$23.00
30	3½	11.00	110	6¾	24.00
35	3¾	10.00	115	6¾	25.00
40	4	10.50	120	6½	26.00
45	4¼	11.00	125	6½	27.50
50	4¼	11.50	135	6¾	29.00
55	4½	12.00	135	6¾	31.50
60	4½	13.00	140	7	33.00
65	4¾	14.00	145	7	35.00
70	5	15.00	150	7	36.00
75	5	16.00	160	7¼	41.50
80	5¼	17.50	170	7¼	44.50
85	5¼	18.50	180	8	47.00
90	5½	20.00	190	8	53.00
95	5¾	21.00	200	8	56.00
100	6	22.00	...	...	.....

VISE BOXES AND SCREWS

No. 1—1½-in. Screw for Vises Nos. 30 to 50.	
Price	each, \$ 3.50
No. 2—1¼-in. Screw for Vises Nos. 55 to 70.	
Price	each, 4.00
No. 3—1¼-in. Screw for Vises Nos. 75 to 85.	
Price	each, 4.50
No. 4—1½-in. Screw for Vises Nos. 90 to 125.	
Price	each, 6.50
No. 6—1¾-in. Screw for Vises Nos. 130 to 195.	Price.....each, \$ 9.50
No. 7—2 in. Screw for Vises Nos. 200 to 250.	Price.....each, 11.00

Showing Extra Box
and Screw

FIG. 2383

HICKORY TOOL HANDLES

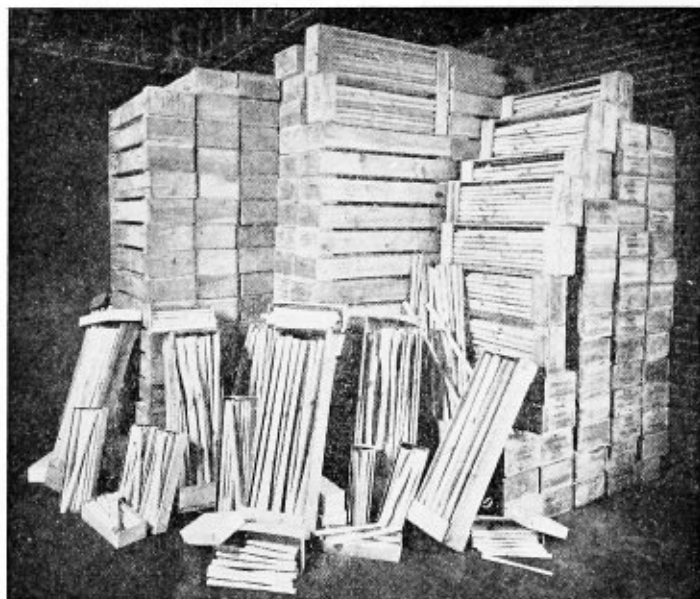


FIG. 2384

Brands and Gradings.

“PARAMOUNT”

All our handles sold under this brand are hand shaved from super extra second growth young hickory, all white wood. To insure delivery to the user, unsoiled, each handle is packed in paper envelope.

“BESTOVALL”

Turned from all white second growth hickory, free from defects or blemishes.

“MONARCH”

This is a good commercial grade of handle, used extensively by railroads and car builders. Small handles will run nearly all white, while large handles may contain red streaks and slight imperfections.

“PACKING”

All handles over 24 inches long packed two dozen to crate.

Handles 24 inches and smaller packed in paper cartons of one dozen each, 5 dozen to crate.

**"PARAMOUNT"
HAND SHAVED HICKORY HANDLES**

SUPER EXTRA SECOND GROWTH YOUNG TENNESSEE HICKORY

"YE OLDE TYME QUALITYE"

SINGLE BIT AXE, OVAL



FIG. 2385

36 Inches, Weight per Crate of 2 Dozen, 42 lbs.....list, per doz. \$12.00

SINGLE BIT AXE, OCTAGON



FIG. 2386

36 Inches, Weight per Crate of 2 Dozen, 42 lbs.....list, per doz. \$12.00

DOUBLE BIT AXE, OVAL



FIG. 2387

36 Inches, Weight per Crate of 2 Dozen, 42 lbs.....list, per doz. \$12.00

DOUBLE BIT AXE, OCTAGON



FIG. 2388

36 Inches, Weight per Crate of 2 Dozen, 42 lbs.....list, per doz. \$12.00

All packed two dozen in a crate. Every handle carefully wrapped.

"PARAMOUNT"
HAND SHAVED HICKORY HANDLES—
 CONTINUED

SUPER EXTRA SECOND GROWTH, YOUNG TENNESSEE HICKORY
 "YE OLDE TYME QUALITYE"

SLEDGE, OVAL



FIG. 2389

36 Inches, Weight per Crate of 2 Dozen, 40 lbs.....	list, per doz.	\$ 9.00
30 Inches, Weight, per Crate of 2 Dozen, 35 lbs.....	list, per doz.	10.00

SLEDGE, OCTAGON



FIG. 2390

30 Inches, weight per Crate of 2 Dozen, 35 lbs.....	list, per doz.	\$ 9.00
36 Inches, Weight per Crate of 2 Dozen, 40 lbs.....	list, per doz.	10.00

SPIKE MAUL, OVAL



FIG. 2391

30 Inches, Weight per Crate of 2 Dozen, 34 lbs.....	list, per doz.	\$ 9.00
36 Inches, Weight per Crate of 2 dozen, 40 lbs.....	list, per doz.	10.00

All above packed two dozen in crate. Each handle carefully wrapped.

MACHINIST HAMMER, OVAL



FIG. 2392

16 Inches, Weight per Crate of 2 Dozen, 8 lbs.....	list, per doz.	\$ 4.00
18 Inches, Weight per Crate of 2 Dozen, 9 lbs.....	list, per doz.	4.50
24 Inches, Weight per Crate of 2 Dozen, 12 lbs.....	list, per doz.	8.00

All above packed in neat pasteboard box.

HICKORY TOOL HANDLES

AXE, SINGLE BIT, CROOKED OR STRAIGHT



FIG. 2393

Inches	34	36
Weight, per crate 2 dozen.....	pounds 40	42
"Monarch"	list, per dozen \$ 7.00	\$ 7.00
"Bestovall"	list, per dozen 10.00	10.00

DOUBLE BIT AXE HANDLE



FIG. 2394

Inches	34	36
Weight, per crate 2 dozen.....	pounds 40	42
"Monarch"	list, per dozen \$ 7.00	\$ 7.00
"Bestovall"	list, per dozen 10.00	10.00

MINERS' AXE HANDLE



FIG. 2395

Inches	26	28
Weight, per crate 2 dozen.....	pounds 28	30
"Monarch"	list, per dozen \$ 4.25	\$ 4.25
"Bestovall"	list, per dozen 7.00	7.00

ADZE, RAILROAD OR CARPENTER HANDLE



FIG. 2396

Inches	34	36
Weight, per crate 2 dozen.....	pounds 45	45
"Monarch"	list, per dozen \$ 7.00	\$ 7.00
"Bestovall"	list, per dozen 10.00	10.00

PICK, RAILROAD, CONTRACTORS, SURFACE AND MATTOCK HANDLE



FIG. 2397

Inches	36	
Weight, per crate 2 dozen.....	pounds 65	
"Monarch"	list, per dozen \$ 7.00	\$ 7.00
"Bestovall"	list, per dozen 10.00	10.00

HICKORY TOOL HANDLES—CONTINUED

OVAL DRIFTING PICK HANDLES



FIG. 2398

Inches	34
Weight, per crate 2 dozen	pounds 50
"Monarch"	list, per dozen \$7.00
"Bestovall"	list, per dozen 10.00

OVAL POLL PICK HANDLE



FIG. 2399

Inches	34
Weight, per crate 2 dozen	pounds 50
"Monarch"	list, per dozen \$7.00
"Bestovall"	list, per dozen 10.00

BITUMINOUS COAL PICK HANDLE



FIG. 2400

Size	1	2	3	4
Width of Eye	inches 3x $\frac{5}{8}$	3x $\frac{3}{4}$	3 $\frac{1}{2}$ x $\frac{7}{8}$	3 $\frac{1}{2}$ x $\frac{7}{8}$
Weight, per crate 2 dozen	pounds 40	40	42	45
"Monarch"	list, per dozen \$4.75	\$4.75	\$4.75	\$5.75
"Bestovall"	list per dozen 6.75	6.75	6.75	7.75

ANTHRACITE MINERS' PICK, 36 INCHES



FIG. 2401

Width of Eye	inches 3 $\frac{1}{2}$ x1	4x1	4 $\frac{1}{2}$ x1 $\frac{1}{8}$
Weight per crate 2 dozen	pounds 63	75	100
"Monarch"	list, per dozen \$6.50	7.25	7.60

OVAL SLEDGE HAMMER HANDLE



FIG. 2402

Inches	24	26	28	30	32	34	36	38	40
W't per crate 2 doz....lbs.	24	28	32	36	38	40	42	46	52
"Monarch," list per dozen	\$3.00	3.25	3.25	4.25	4.25	4.75	4.75	5.25	6.00
"Bestovall," list per dozen	5.00	5.50	5.50	6.50	6.50	7.25	7.25	8.00	8.50

HICKORY TOOL HANDLES—CONTINUED

OVAL ANVIL TOOL HANDLES



FIG. 2403

List Prices

Inches	16	18	20	24	30	36
Weight per crate, 2 dozen.....lbs.	15	18	20	24	34	40
"Monarch"	list per doz. \$1.80	1.95	2.20	3.00	4.25	4.75
"Bestovall"	list per doz. 3.00	3.25	3.50	5.00	6.50	7.25

OVAL SPIKE MAUL HANDLE



FIG. 2404

List Prices

Inches	24	26	28	30	32	34	36	38	40
W't per crate, 2 doz.....lbs.	22	26	30	34	36	38	40	44	48
"Monarch"	list per doz. \$3.00	3.25	3.25	4.25	4.25	4.75	4.75	5.25	6.00
"Bestovall"	list per doz. 5.00	5.50	5.50	6.50	6.50	7.25	7.25	8.00	8.50

OVAL NAPPING HAMMER HANDLE



FIG. 2405

List Prices

Inches	24	26	28	30	32	34	36	38	40
W't per crate, 2 doz.....lbs.	22	25	28	32	34	36	38	42	46
"Monarch"	list per doz. \$3.00	3.25	3.25	4.25	4.25	4.75	4.75	5.25	6.00
"Bestovall"	list per doz. 5.00	5.50	5.50	6.50	6.50	7.25	7.25	8.00	8.50

ADZE EYE HAMMER HANDLE



FIG. 2406

List Prices

Inches	13	14	15	16
Weight per crate, 5 doz.....lbs.	30	30	32	38
"Monarch"	list per doz. \$1.65	1.65	1.65	1.80
"Bestovall"	list per doz. 2.50	2.50	2.50	3.00

STONE HAMMER HANDLE



FIG. 2407

List Prices

Inches	12	14	16
Weight per crate, 5 Doz.....lbs.	20	24	28
"Monarch"	list per doz. \$1.65	1.65	1.80
"Bestovall"	list per doz. 2.50	2.50	3.00

HICKORY TOOL HANDLES—CONTINUED

BLACKSMITH HAND HAMMER HANDLE



FIG. 2408

Note.—Machine Hammer and Blacksmith Hand Hammer take same list. Blacksmith Hand Hammer handles are heavier than Machine.



FIG. 2409

LIST PRICES

Inches	12	14	15	16	18	20	22	24	26
Weight, per crate,									
5 doz. ....lbs.	24	26	28	32	36	40	50	60	65
"Monarch" ...list per doz.	\$1.65	1.65	1.65	1.80	1.95	2.20	2.50	3.00	3.25
"Bestovall" ..list per doz.	2.50	2.50	2.50	3.00	3.25	3.50	4.00	5.00	5.50

SHINGLING HATCHET HANDLE



FIG. 2410

LIST PRICES

Inches	13	14	15
Weight, per crate, 5 dozen.....lbs.	25	27	30
"Monarch"	list per doz. \$1.65	1.65	1.65
"Bestovall"	list per doz. 2.50	2.50	2.50

BROAD HATCHET HANDLE



FIG. 2411

Inches	16	18
Weight, per crate, 5 dozen.....lbs.	38	42
"Monarch"	list per doz. \$2.00	2.30
"Bestovall"	list per doz. 3.30	3.60

POLICE BILLIES



FIG. 2412

Furnished in any length, size or color desired.

List pricelist per doz. \$36.00

"BESTOVALL" HATCHETS

Forged from high grade steel, extra tempered. Sharpened ready for use. Fire blued finish. Deep etched. Select second growth hickory handles.

Half

**FIG. 2413****HALF HATCHETS**

Nos.	1	2	3
Width of Cut.....ins.	3¼	3½	4
Length Over All...ins.	12½	13½	14½
Weight per doz., about	20	23	30
List price....per doz.	\$8.50	9.00	9.50

Shingling

**FIG. 2414****SHINGLING HATCHETS**

Nos.	0	1	2	3
Width of Cut.....ins.	3¼	3½	4	4½
Length Over All...ins.	12	13	14	14½
Weight per doz., about	20	22	25	30
List price...doz.	\$7.50	8.00	8.50	9.00

Claw

**FIG. 2415****CLAW HATCHETS**

Nos.	1	2	3
Width of Cut.....ins.	3¼	4	4½
Length Over All...ins.	13	14	14½
Weight per doz., about	23	28	30
List price....per doz.	\$9.00	9.50	10.00

Lathing

**FIG. 2416****LATHING HATCHETS**

Nos.	1	2
Width of Cut.....ins.	2¼	2½
Length Over All...ins.	12	13
Weight per doz., about	18	22
List price.....per doz.	\$8.00	8.50

“BESTOVALL” BROAD OR BENCH HATCHETS



FIG. 2417

Nos.	1	2	3	4	5	6
Width of Cut.....inches	4	4½	5	5½	6	6½
Length Over All.....inches	14	14½	15	15½	16½	17½
Weight per dozen, about.....lbs.	23	26	30	36	42	49
List price .....per dozen	\$10.50	11.50	13.00	14.50	16.50	18.00

“BESTOVALL” BARREL OR BOX HATCHETS

Gold Bronzed Body, Extra Polished Bit and Head, With Special Top Nail Slot, Square Checkered Face.

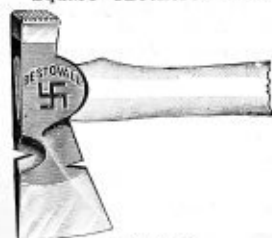


FIG. 2418

Width of Cut.....inches	2
Length Over All.....inches	11½
Weight per dozen, about.....lbs.	14
List price .....per doz.	\$12.00

“BESTOVALL” HUNTERS AXES

Yankee Pattern, Full Polished and Etched, With Sportsmen's Pattern Handle.



FIG. 2419

Width of Cut.....inches	2¾
Length Over All.....inches	13½
Weight per dozen, about.....lbs.	20
List price .....per dozen	\$11.00

"FORT PITT" HATCHETS

Made of High Grade Steel. Hand Forged and Tempered. Fire Bronze Finish.
Polished Bit. Best Quality Handle.



FIG. 2420



FIG. 2421



FIG. 2422

HALF HATCHETS

Size 1. Cuts $3\frac{1}{4}$ in.; weight per doz., 22 lbs.	price per doz. \$ 8.50
Size 2. Cuts $3\frac{3}{4}$ in.; weight per doz., 25 lbs.	price per doz. 9.00

SHINGLING HATCHETS

Size 1. Cuts $3\frac{1}{2}$ in.; weight per doz., 20 lbs.	price per doz. \$ 8.00
Size 2. Cuts $3\frac{3}{4}$ in.; weight per doz., 25 lbs.	price per doz. 8.50

CLAW HATCHETS

Size 1. Cuts $3\frac{1}{2}$ in.; weight per doz., 22 lbs.	price per doz. \$ 9.00
Size 2. Cuts $3\frac{3}{4}$ in.; weight per doz., 25 lbs.	price per doz. 9.50



FIG. 2423

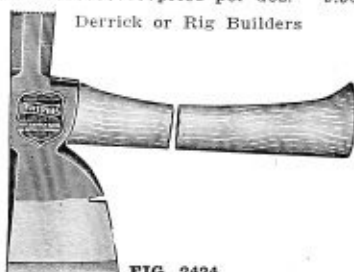


FIG. 2424

LATHING HATCHETS

Size 1. Cuts $2\frac{1}{2}$ in.; weight per doz., 18 lbs.	price per doz. \$ 8.00
Size 2. Cuts $2\frac{3}{4}$ in.; weight per doz., 20 lbs.	price per doz. 8.50

DERRICK OR RIG BUILDERS HATCHETS

Size 3. Cuts 3 in.; weight per doz., 40 lbs.	price per doz. \$20.00
--	------------------------

18 Inch Handles.

Broad or Bench



FIG. 2425

BROAD OR BENCH HATCHETS

Size 2. Cuts $4\frac{1}{2}$ in.; weight per doz., 28 lbs.	price per doz. \$11.50
Size 3. Cuts 5 in.; weight per doz., 33 lbs.	price per doz. 13.00
Size 4. Cuts $5\frac{1}{2}$ in.; weight per doz., 37 lbs.	price per doz. 14.50

"BESTOVALL" AXES

BLUE FINISH

POLISHED BITS

Dayton Pattern
Single Bit,
Unhandled

Dayton Pattern Single Bit, Handled



Fig. 2426



FIG. 2427

Plain Pattern Double Bit, Handled



FIG. 2428

Plain Pattern
Double Bit,
Unhandled

FIG. 2429

Single Bit, Unhandled.....base price per dozen \$.....
 Double Bit, Unhandled.....base price per dozen
 Extra for Handled Axes.....per dozen

See Following Page for Standard Extras

"BESTOVALL" FIREMEN'S AXES

RED FINISH

Size	lbs.	3½	4	4½	5	5½	6
Per dozen		\$30.00	30.50	31.00	31.50	32.00	32.50



FIG. 2430

"BESTOVALL" MINERS' AXES HANDLED

EBONY FINISH

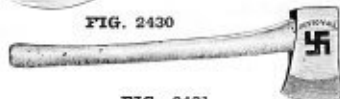


FIG. 2431

Base price per dozen..... \$.....

Subject to Standard Axe List of Extras
 for heavier weights.

STANDARD AXE LIST

SHOWING EXTRAS FOR WEIGHTS HEAVIER THAN BASE

3½ POUND GROUP

Base price as quoted

All 2, 2¼, 2½, 2¾, 3, 3¼ or 3½ lbs. or assorted

2 to 2¼	2¼ to 3¼	2¾ to 3¾
2 to 2½	2½ to 3½	2¾ to 4
2 to 2¾	2½ to 3¾	3 to 3¼
2 to 3	2½ to 2	3 to 3½
2 to 3¼	2½ to 3¼	3 to 3¾
2¼ to 3½	2½ to 3½	3 to 4
2¼ to 2½	2¾ to 3	3¼ to 3½
2¼ to 2¾	2¾ to 3¼	3¼ to 3¾
2 to 3	2¾ to 3½	

Total weight per dozen not over 42 lbs.
No axe over 4 lbs.

4 POUND GROUP

25c extra above base

All 3¾ lbs. or 4 lbs. of assorted.

3 to 4¼	3¼ to 4¼	3½ to 4½
3 to 4½	3½ to 3¾	3¾ to 4
3¼ to 4	3½ to 4	3¾ to 4¼
3¼ to 4¼	3½ to 4¼	

Total weight per dozen not over 48 lbs.
No axe over 4½ lbs.

4½ POUND GROUP

50c extra above base

All 4¼ lbs. or 4½ lbs. or assorted

3½ to 4¾	3¾ to 5	4 to 5
3½ to 5	4 to 4¼	4¼ to 4½
3¾ to 4½	4 to 4½	4¼ to 4½
3¾ to 4¾	4 to 4¾	

Total weight per dozen not over 54 lbs.
No axe over 5 lbs.

5 POUND GROUP

75c extra above base

All 4¾ lbs. or 5 lbs. assorted

4 to 5½	4½ to 5½	4½ to 5½
4 to 5¾	4½ to 5¾	4½ to 5¾
4 to 6	4½ to 6	4½ to 6
4 to 4¾	4½ to 4¾	4¾ to 5
4½ to 5	4½ to 5	4¾ to 5½
4½ to 5½	4½ to 5½	

Total weight per dozen not over 60 lbs.
No axe over 6 lbs.

5½ POUND GROUP

\$1.00 extra above base

All 5¼ lbs. or 5½ lbs. or assorted

4¾ to 5½	5 to 5¼	5 to 6
4¾ to 5¾	5 to 5½	5¼ to 5½
4¾ to 6	5 to 5¾	5¼ to 5¾

Total weight per dozen not over 66 lbs.
No axe over 6 lbs.

6 POUND GROUP

\$1.25 extra above base

All 5¾ lbs. or 6 lbs. or assorted

5¼ to 6	5½ to 5¾	5½ to 6½
5¼ to 6¼	5½ to 6	5¾ to 6
5¼ to 6½	5½ to 6¼	5¾ to 6¼

Total weight per dozen not over 72 lbs.
No axe over 6½ lbs.

6½ POUND GROUP

\$1.75 extra above base

All 6¼ lbs. or 6½ lbs. or assorted

5¾ to 6½	6 to 6¼	6 to 7
5¾ to 6¾	6 to 6½	6¼ to 6½
5¾ to 7	6 to 6¾	6¼ to 6¾

Total weight per dozen not over 78 lbs.
No axe over 7 lbs.

7 POUND GROUP

\$2.25 extra above base

All 6¾ lbs. or 7 lbs. or assorted

6¼ to 7	6½ to 6¾	6½ to 7½
6¼ to 7¼	6½ to 7	6¾ to 7
6¼ to 7½	6½ to 7¼	6¾ to 7¼

Total weight per dozen not over 84 lbs.
No axe over 7½ lbs.

7½ POUND GROUP

\$2.75 extra above base

All 7¼ lbs. or 7½ lbs. or assorted

6¾ to 7½	6¾ to 8¼	7 to 7¾
6¾ to 7¾	7 to 7½	7 to 8
	7 to 7	

Total weight per dozen not over 90 lbs.
No axe over 8 lbs.

8 POUND GROUP

\$3.25 extra above base

All 7¾ lbs. or 8 lbs.

"BESTOVALL" BROAD AXES

PITTSBURGH PATTERN

BLUED FINISH

POLISHED HEAD AND BIT



FIG. 2432

Weights in a Box, Assorted.....lbs.	6 to 7	7 to 8
Width of Cutting Edge.....inches	11 to 12	12 to 13
Weight per dozen, about.....lbs.	90	102
List price .....per dozen	\$32.00	35.00

"BESTOVALL" ADZES

BLUED FINISH

POLISHED BITS

Railroad

Carpenters

Ship



FIG. 2433



FIG. 2434



FIG. 2435

	Width of Cut	Price per Dozen
Railroad	4 to 6 inches	\$30.00
Carpenter's	3½ to 4½ inches	30.00
Ship	4 to 4½ inches	36.00

STONE MASONS' MALLET

Plain finish, extra selected and seasoned hickory head; hardwood handle, 6 inches long, fitted to head.

Size	inches 5 to 6	6 to 7	7 to 8
Per dozen	\$18.00	28.00	36.00



FIG. 2436

RUBBER MALLET

Heads of firm and tough rubber, resilient and durable. Handles of best second growth hickory.



FIG. 2437

No.	Length of Head, Inches	Diam. of Face, Inches	Weight, Lbs.	List Price, Per Doz.
1-Small	3	2¼	1½	\$15.00
2-Med.	4	2¾	1¾	20.00
3-Large	4½	2½	2½	27.00

ROUND MALLET

s. 1 to 3, Hickory; Nos. 5 to 7, Lignumvitæ.

Mortised Handles



FIG. 2438

No.	Length Head, Inches	Diam. Head, Inches	List Price, Per Doz.
1	5	3	\$2.40
2	5½	3½	3.00
3	6	4	3.84
5	5	3	1.68
6	5½	3½	4.56
7	6	4	6.00

SQUARE MALLET

Mortised Handles.
Nos. 8 to 10, Hickory;
Nos. 11 to 13,
Lignumvitæ



FIG. 2439

No.	Length Head, Inches	Diam. Head, Inches	List Price, Per Doz.
8	6	2½x3½	\$2.76
9	6½	2¾x3¾	3.60
10	7	3 x4	4.20
11	6	2½x3½	5.76
12	6½	2¾x3¾	7.32
13	7	3 x4	8.88

ROUND MALLET



FIG. 2440

Mortised Handles.
Iron Rings.

No.	Length Head, Inches	Diam. Head, Inches	List Price, Per Doz.
14	6	4	\$8.04
14½	5½	3½	5.88



FIG. 2441

16 Round Mallet, Heavy Malleable Iron Socket, Mortised, Hickory Ends, 3 in. diameter.

List price, per dozen...\$10.44

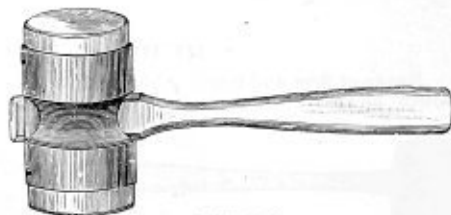


FIG. 2442



FIG. 2443

ROUND MALLETS

MORTISED HANDLES

15 Round Iron Mallet, Mortised, Hickory Ends, 2½ in. diameter.

List price, per dozen.....\$5.64

TINNERS' MALLETS

No. 4 Round Hickory, 5½ in. long, assorted, 2¼ and 2½ in. diameter.

List price, per dozen.....\$1.68

HIDE FACED HAMMERS

A valuable hammer for machinists, etc. Strikes a blow without bruising. When worn out, faces are renewed at slight cost, by fastening hammer in a vise, when, with a few blows, the faces drop out.

LIST OF PRICES WITHOUT EXTRA FACES

No.	Weight	Diam. of Face	Price, Per Doz.	Extra Faces, Per Doz. Pairs
0	½ lb.	¾ in.	\$10.80	\$ 3.36
1	1¼ lb.	1¼ in.	12.60	3.60
2	1½ lb.	1½ in.	16.08	4.32
3	2¼ lb.	1¾ in.	19.20	5.52
4	4 lb.	2 in.	27.84	7.68
5	5¼ lb.	2¾ in.	39.96	10.92



FIG. 2444

RAW HIDE MALLETS



FIG. 2445

No.	Diam.	Length	Weight	Price, Per Doz.
0	1 in.	2¾ in.	2 oz.	\$ 4.32
1	1¼ in.	3¼ in.	4 oz.	5.52
2	1½ in.	3¼ in.	6 oz.	6.60
3	1¾ in.	3¾ in.	8 oz.	7.68
4	2 in.	3½ in.	10 oz.	9.72
5	2¾ in.	4¼ in.	22 oz.	21.60
6	2¾ in.	4¾ in.	24 oz.	24.36

BOYER RIVETING, CHIPPING AND CALKING HAMMERS

No. 80 Riveting Hammer



FIG. 2446

The Boyer Hammer, in its various forms, is divided into three distinct members—cylinder, handle and valve—a principle of construction that provides for quick examination and economical upkeep and repairs. In each of these members there is a moving part subject to wear but in varying degrees. It is frequently possible to replace but one of these members and obtain a comparatively new hammer as a result. All parts are made with jigs and templates and are absolutely interchangeable.

No.	Boyer Diameter Piston Inches	Riveting Length Stroke Inches	Hammer Capacity Rivets	Cu. Ft. Free Air Per Min.	Net Weight Lbs.
50	1 1/8	5	3/4	25	20
60	1 1/8	6	1 1/8	25	23
80	1 1/8	8	1 3/4	25	25
90	1 1/8	9	1 3/4	25	26
80-X	1 1/8	8	1 3/4	25	25 1/2
11	1 1/8	11	1 3/4	30	31 1/2

B-K Chipping and Calking Hammer

BOYER CHIPPING AND CALKING HAMMERS



FIG. 2447

Capacity	Size	Diameter Piston Inches	Length Stroke Inches	Cu. Ft. Free Air Per Min.	Net Weight Lbs.
Light chipping	BK-1	1 1/8	1 1/2	10	11 1/2
Light chipping or calking	BK-1X	1 1/8	1 1/2	11	12 1/2
Average chipping and calking	BK-2	1 1/8	2	12	13
Average chipping and calking	BK-2X	1 1/8	2 1/2	12 1/2	14
Heavy chipping or calking and light riveting	BK-3	1 1/8	3	13	14 1/2
Heavy chipping or calking and light riveting	BK-3X	1 1/8	3 1/2	13 1/2	15
Heaviest chipping	BK-4	1 1/8	4	14	15 1/2

BOYER RIVET BUSTERS

The Boyer Rivet Buster is a handy machine for cutting off rivets in structural iron works, boiler and railway shops, also in scrap yards, and in the dismantling and removal of steel structures of all kinds. It is fitted with a chisel holder which prevents the shooting out of the chisel and piston and will cut off 3/4" and 1" rivets in from 3 to 8 seconds. Made in two sizes.



FIG. 2448

Size No.	1	2
Diameter piston	1 1/8"	2 1/8"
Length stroke	9"	12"
Blows per minute	680	360
Cu. ft. free air per min.	40	50
Length over all, including chisel	38 3/4"	40"
Net wt. with chisel, lbs.	66	137

"BESTOVALL" ADZE EYE NAIL HAMMERS

No. 31½ Octagon Poll

No. 51½-A Ripping

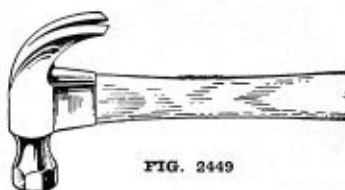


FIG. 2449

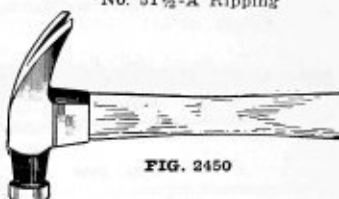


FIG. 2450

NO. 31½ ROUND NECK, OCTAGON POLL, FULL NICKED, HICKORY HANDLE

No.	31	31½	32	33
Size	1	1½	2	3
Weight	1 lb. & 4 oz.	1 lb.	13 oz.	7 oz.
Length over all...inches	13½	13	13	12
List.....per dozen	\$14.00	13.50	13.00	12.50

NO. 51½-A-ROUND NECK, ROUND POLL, POLISHED, HICKORY HANDLE

No.	51 A	51½ A	52 A
Size	1	1½	2
Weight	1 lb. & 4 oz.	1 lb.	13 oz.
Length over all...inches	13½	13	13
List.....per dozen	\$9.00	8.50	8.00

"FORT PITT" ADZE EYE NAIL HAMMERS

No. 51½ Bell Face

No. 41½ Plain

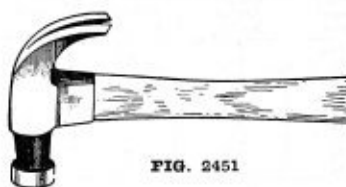


FIG. 2451

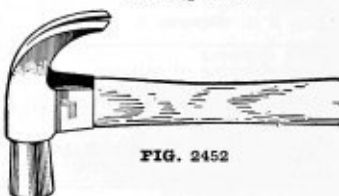


FIG. 2452

NO. 51½-ROUND NECK AND POLL, POLISHED, HICKORY HANDLES

No.	50	51	51½	52	52½	53	54
Size	0	1	1½	2	2½	3	4
Weight	1 lb. & 12 oz.	1 lb. & 4 oz.	1 lb.	13 oz.	10 oz.	7 oz.	5 oz.
Length over all, in.	15	13½	13	13	12½	12	12
List.....per dozen	\$12.50	9.00	8.50	8.00	7.75	7.50	7.25

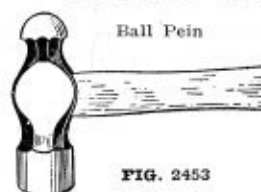
NO. 41½-PLAIN NECK AND POLL, POLISHED, HICKORY HANDLES

No.	40	41	41½	42	43	44
Size	0	1	1½	2	3	4
Weight	1 lb. & 12 oz.	1 lb. & 4 oz.	1 lb.	13 oz.	7 oz.	5 oz.
Length over all...inches	15	13½	13	13	12	12
List.....per dozen	\$12.50	9.00	8.50	8.00	7.50	7.25

Weights given do not include handles.

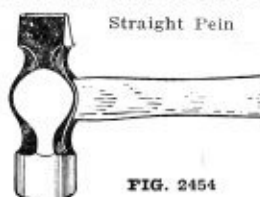
MACHINISTS' HAMMERS

"BESTOVALL"—FIRST QUALITY CAST STEEL, RUSTLESS BLACK FINISH
 "FORT PITT"—HAND MADE, BLACK FORGE, SEMI-POLISHED



Ball Pein

FIG. 2453



Straight Pein

FIG. 2454



Cross Pein

FIG. 2455

Size	00000	0000	000	00	0	1	2
Weight	4 oz.	6 oz.	8 oz.	12 oz.	1 lb.	1 lb., 4 oz.	1 lb., 8 oz.
"Bestovall"...per dozen	\$12.00	12.00	12.00	12.00	12.50	13.50	14.50
"Fort Pitt"...per dozen	12.00	12.00	12.00	12.00	12.50	13.50	14.50

Size	3	4	5	6	7	8	9
Weight	1 lb.	2 lbs.	2 lbs.	2 lbs.	2 lbs.	3 lbs.	3 lbs.
	12 ozs.	2 lbs.	4 ozs.	8 ozs.	12 ozs.	3 lbs.	8 ozs.
"Bestovall"...per doz.	\$15.50	16.50	17.50	19.00	20.50	22.00	24.00
"Fort Pitt"...per doz.	15.50	16.50	17.50	19.00	20.50	22.00	24.00

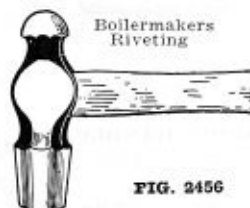
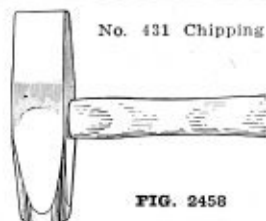
Boilermakers
Riveting

FIG. 2456

No. 1060
Boilermakers

FIG. 2457



No. 431 Chipping

FIG. 2458

BOILERMAKERS' RIVETING HAMMERS

No.	441B	442B	443B	443C
Size	1	2	3	4
Weight	1 lb., 8 ozs.	2 lbs.	2 lbs., 8 ozs.	3 lbs.
List.....per dozen	\$14.50	16.50	19.00	22.00

NO 1060 BOILERMAKERS' HAMMERS

Weight	lbs.	2	2½	3
Length	inches	7	7¾	8
List price.....	each	\$1.10	1.40	1.70

Handles extra on above.

NO. 431 CHIPPING HAMMERS
STRAIGHT PEIN, POLISHED, HICKORY HANDLES

No.	430	431	432	433	434
Size	0	1	2	3	4
Weight	1 lb., 4 ozs.	1 lb., 8 ozs.	2 lbs.	2 lbs., 8 ozs.	2 lbs., 14 ozs.
List...per doz.	\$13.00	13.50	14.50	15.50	16.50

Weights given do not include handles

ENGINEERS' HAMMERS

No. 382 Cross Pein

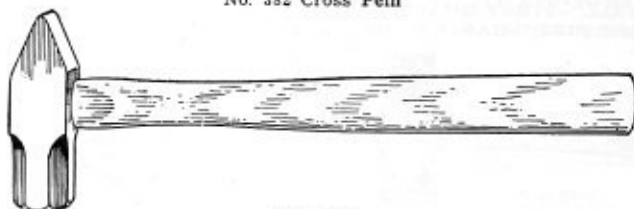


FIG. 2459

NO. 382—CROSS PEIN, POLISHED, HICKORY HANDLE

No.	380	381	382	383	384	385	386
Size	0	1	2	3	4	5	6
Weight	1 lb. 2 ozs.	1 lb., 10 ozs.	2 lbs.	2 lbs., 8 ozs.	3 lbs.	3 lbs., 8 ozs.	4 lbs., 8 ozs.
List, per doz.	\$12.00	13.00	14.00	15.00	16.00	17.00	19.00

No. 392 Double Face



FIG. 2460

NO. 392—DOUBLE FACE, POLISHED, HICKORY HANDLE

No.	391	392	393	394
Size	1	2	3	4
Weight	1 lb., 8 ozs.	2 lbs., 6 ozs.	3 lbs.	3 lbs., 10 ozs.
List.....per dozen	\$14.50	16.50	18.00	19.50

BLACKSMITHS' HAND HAMMERS

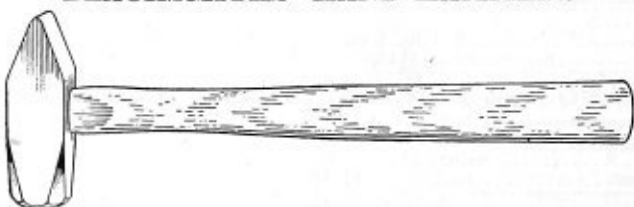


FIG. 2461

PLAIN EYE, POLISHED, HICKORY HANDLE

No.	400	401	402	403	404	405
Size	0	1	2	3	4	5
Weight	1 lb., 10 ozs.	2 lbs.	2 lbs., 10 ozs.	3 lbs.	3 lbs., 8 ozs.	4 lbs., 8 ozs.
List...per doz.	\$13.00	14.00	15.00	16.00	17.00	19.00

Weights given do not include handle.

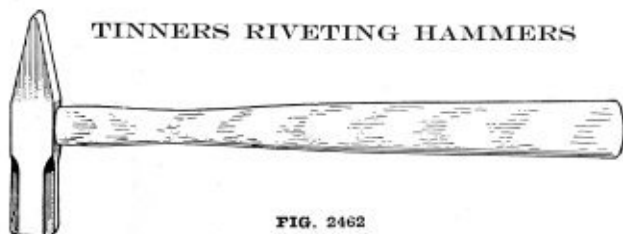
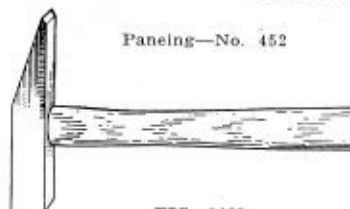


FIG. 2462

PLAIN EYE, POLISHED, HICKORY HANDLE

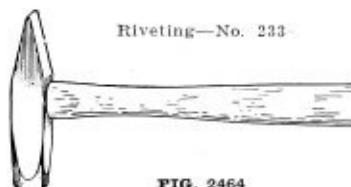
No.	461	462	463	464	465
Size	1	2	3	4	5
Weight	8 ozs.	12 ozs.	1 lb.	1 lb., 4 ozs.	1 lb., 8 ozs.
List.....per doz.	\$6.00	6.25	6.75	7.25	7.75

TINNERS HAMMERS



Paneing—No. 452

FIG. 2463



Riveting—No. 233

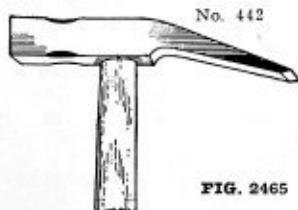
FIG. 2464

NO. 452—PLAIN EYE, POLISHED, HICKORY HANDLE

No.	450	451	452	453	454
Size	0	1	2	3	4
Weight	5 ozs.	8 ozs.	12 ozs.	1 lb.	1 lb., 4 ozs.
List.....per doz.	\$5.75	6.00	6.25	6.75	7.25

NO. 233—PLAIN EYE, POLISHED, HICKORY HANDLE
FOR ORDINARY RIVETING

No.	230	231	232	233	234	235	236	237
Size	0	1	2	3	4	5	6	7
Weight	4 ozs.	7 ozs.	9 ozs.	12 ozs.	15 ozs.	1 lb., 2 ozs.	1 lb., 6 ozs.	1 lb., 10 ozs.
List...per doz.	\$5.50	5.75	6.00	6.25	6.50	7.00	7.50	8.00



No. 442

FIG. 2465

BRICKLAYERS HAMMERS
PLAIN EYE, POLISHED, HICKORY HANDLE

No.	441	442	443	444
Size	1	2	3	4
Weight ...	1 lb., 2 ozs.	1 lb., 8 ozs.	2 lbs.	2 lbs., 8 ozs.
List, per doz.	\$11.00	12.00	13.00	14.00

Weights given do not include handles.

SLEDGES AND HAMMERS

Cross Pein
Sledge

FIG. 2466

Blacksmiths'
Straight Pein
Sledge

FIG. 2467

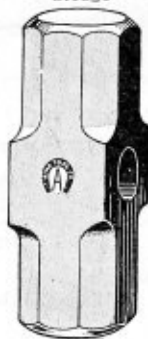
Double Face
Sledge

FIG. 2468

Blacksmiths'
Hand Hammer

FIG. 2469

Weight	pounds	5 or Over	3 to 5	Under 3
Blacksmiths' Sledges, Cross Pein	per lb.	\$0.30	.40	.50
Blacksmiths' Sledges, Straight Pein	per lb.	.30	.40	.50
Blacksmiths' Sledges, Double Face	per lb.	.30	.40	.50
Blacksmiths' Hand Hammers	per lb.	...	.40	.50

Striking and
Drilling

FIG. 2470

Napping



FIG. 2471

Ship Mauls



FIG. 2472

Macadamizing
Hammer

FIG. 2473

Weight	pounds	5 or Over	3 to 5	Under 3
Striking and Drilling Hammers	per lb.	\$0.30	.40	.50
Napping Hammers	per lb.	.30	.40	.50

SHIP OR TOP MAULS

Sizes made, pounds.... 4, 4½, 5, 5½, 6, 7, 8.....price, per lb. \$0.42

MACADAMIZING HAMMERS

Sizes made, pounds.... 1, 1½, and 2.....price, per lb. \$0.75

SLEDGES AND HAMMERS—CONTINUED

Stone Sledge,
Oval Face

FIG. 2475

Masons' Hammer



No. 2476

Spalling or Stone
Hammer

FIG. 2477

Weight	pounds .5 or Over	3 to 5	Under 5
Stone, Oval Face.....	per lb. \$.30	...	...
Stone, Flat Face.....	per lb. .30	...	...
Masons' Hammers	per lb. .50	.55	.60
Spalling Hammers	per lb. .40	.50	.55

Hand Drilling
Hammer

FIG. 2478

Coal Sledge



FIG. 2479

Button Set



FIG. 2480

Weight	pounds .5 or Over	3 to 5	Under 5
Hand Drilling Hammer.....	per lb. \$.40	.50	.55
Coal Sledge	per lb. .30	...	...

BUTTON HEAD RIVET SETS

The catalogue size is the size of rivet for which tool is intended.

Carried in stock.....inches	..	1½	¾	¾	7/8	..
On special order.....inches	¾	..	..	..	..	1
Diameter Cup	¾	¾	1½	1¼	1½	1½
Length	6¼	6¼	7	7	7	7
Weight	3½	3½	5½	5½	7	7
Price	each \$2.70	2.70	3.95	3.95	5.05	5.05

MAULS

PLAIN MAUL



FIG. 2481

BELL FACED MAUL



FIG. 2482

10 lb. each.....list	\$5.25 per doz.	16 lb. each.....list	\$7.00 per doz.
12 lb. each.....list	6.00 per doz.	18 lb. each.....list	7.75 per doz.
13 lb. each.....list	6.25 per doz.	20 lb. each.....list	8.25 per doz.
14 lb. each.....list	6.50 per doz.	25 lb. each.....list	9.75 per doz.
15 lb. each.....list	6.75 per doz.		

WOOD END MAUL



FIG. 2483

8 lb. each.....list	\$5.25 per doz.	12 lb. each.....list	\$6.50 per doz.
9 lb. each.....list	5.50 per doz.	14 lb. each.....list	7.50 per doz.
10 lb. each.....list	5.75 per doz.	16 lb. each.....list	8.50 per doz.
11 lb. each.....list	6.00 per doz.	18 lb. each.....list	9.50 per doz.

COPPER HAMMERS



FIG. 2484

Not cast, but forged from a bar of pure rolled copper.

1 lb.	Per lb.	\$1.00
2 lbs.	Per lb.	.90
3 lbs. or heavier	Per lb.	.80

RAILROAD TRACK TOOLS

SPIKE MAULS

Regular Pattern



FIG. 2485

Weight	lbs.	6	8	10	12
Per lb.		\$0.30	.30	.30	.30

SPIKE MAULS

Pittsburgh Pattern



FIG. 2486

Weight	lbs.	7	8	9	10
Per lb.		\$0.30	.30	.30	.30

TRACK PUNCHES



FIG. 2487

Weight	lbs.	5
Price	each	\$1.50

TRACK CHISELS



FIG. 2488

Weight	lbs.	4	4½	5	5½	6
Price	each	\$1.20	1.35	1.50	1.65	1.80

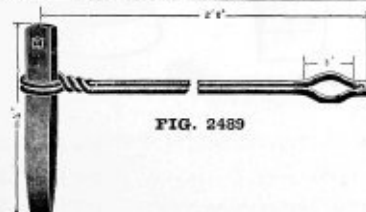


FIG. 2489

IRON HANDLE TRACK CHISEL

This Chisel should be used for all overhead work.

Weight, including handle, 8 lbs.

List price per lb., \$0.40

WOOD CHOPPERS, WEDGES AND MAULS

Truckee Wedge
Straight Bit

FIG. 2490

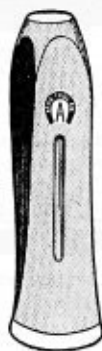
Truckee Wedge
Flared Bit

FIG. 2491

Oregon Pattern
Wedge

FIG. 2492

Truckee, straight bit; weights, 3, 3½, 4, 4½, 5, 5½, 6, 7, 8, 9, 10 lbs.....per lb. \$0.25
 Truckee, flared bit; weights, 5, 6, 7, 8, 9 lbs.....per lb. .36
 Oregon pattern; weights, 4, 5, 5½, 6, 7, 8, 9, 10 lbs.....per lb. .36

Tie Wedge



FIG. 2493

Stave Wedge



FIG. 2494

Straight Bit
Maul

FIG. 2495

Oregon Pattern
Maul

FIG. 2496

Tie wedge; weights, 3, 3½, 4, 4½, 5, 6, 8 lbs.....per lb. \$0.25
 Stave wedge; weights, 3, 3½, 4, 4½, 5 lbs.....per lb. .25
 Straight bit maul; weights, 5, 6, 7, 8, 9 lbs.....per lb. .36
 Oregon pattern maul; weights, 5, 6, 7, 8, 9, 10 lbs.....per lb. .36

RAILROAD TRACK TOOLS

CROW BARS

No. 1160 Wedge Point

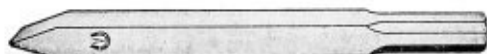


FIG. 2497

No. 1161 Pinch Point

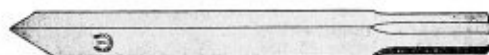


FIG. 2498

Weight, lbs.	10	12	14	16	18	20	22	24	25
Length, ft.	4	4½	4¾	4½½	5	5½	5¾	5¾	5¾
Price, each	\$1.15	1.20	1.25	1.45	1.60	1.80	2.00	2.15	2.25

LINING BARS

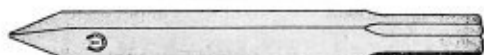


FIG. 2499

Weight	lbs.	16	18	20	22	24	25
Length	inches	59	60	64	67	69	69
Price	each	\$1.70	1.90	2.10	2.30	2.50	2.65

TAMPING BARS

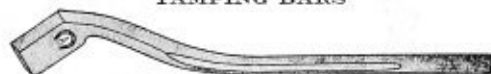


FIG. 2500

Length, 68 inches. Weight, 14 pounds.

Price, each \$1.80

GOOSE NECK RIPPING BARS

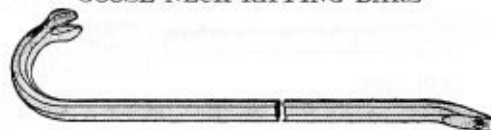


FIG. 2501

Length	inches	24	30	36
Weight	lbs.	3½	4¼	5
Price	per doz.	\$9.00	10.50	12.00

STRAIGHT RIPPING BARS

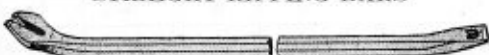


FIG. 2502

Length	inches	24	30	36
Weight	lbs.	3	3¾	4½
Price	per doz.	\$9.00	10.50	12.00

RAILROAD TRACK TOOLS

CLAW BARS

RAILROAD PATTERN



FIG. 2503

Length, 5 ft. 5 in.; weight, 30 lb. For $\frac{3}{4}$ -in. spikes.

Weight for $\frac{3}{4}$ -inch spikes, about 30 lbs. per lb. \$.....

Weight for smaller spikes, 20 to 25 lbs. per lb. \$.....

Above shows claw bar with heel, can also be furnished without heel.

GOOSE NECK PATTERN



FIG. 2504

Length 5 ft., 3 inches

Weight 25 lbs.

Price, each \$4.90



FIG. 2505

TRACK TONGS

Will open to take up to 6-inch girder rail as specified.

Weight 17 lbs.

Price, each \$2.80



FIG. 2506

RAIL FORKS

Length 34 inches

Weight 15 lbs.

Price, each \$2.50

TRACK WRENCHES

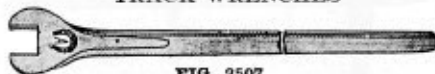


FIG. 2507

Catalogue size is the size bolt the opening will take.

Size inches	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{3}{16}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$
Opening "	$\frac{1}{2}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{3}{8}$	$2\frac{1}{8}$
Length "	24	24	24	24	24	24	24
Weight lbs.	$4\frac{3}{4}$	$4\frac{3}{4}$	$4\frac{3}{4}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$
Price each	\$0.70	.70	.70	1.00	1.00	1.00	1.00
Length inches	30	30	30	30	30	30	30
Weight lbs.	$5\frac{3}{4}$	$5\frac{3}{4}$	$5\frac{3}{4}$	8	8	8	8
Price each	\$0.85	.85	.85	1.20	1.20	1.20	1.20

SPIKE PULLERS

No. 343
Two Knob

FIG. 2508

No. 344
Three Knob

FIG. 2509

No. 343. Two Knob.

1½ lbs.....per dozen \$....

No. 344. Three Knob.

2 lbs.....per dozen \$....

TIE HOLDER

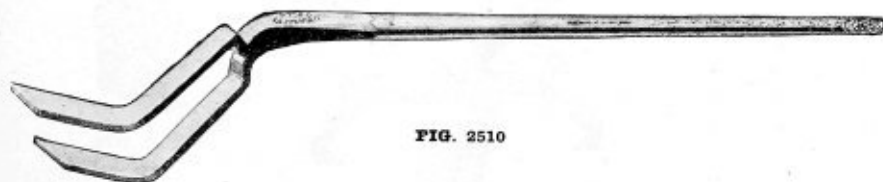


FIG. 2510

Our Tie Holder is made in two sizes. No. 1 is for use with 12 and 16-lb. rails. No. 2 is for use with 20 and 25-lb. rails and is forged from one solid piece of hard steel without a weld. This tool enables roadmen or trackmen to hold the tie against the rail while spiking. Order by number and specify size.

No. 1. Tie Holder	each \$....
No. 2. Tie Holder	each

NATIONAL COMBINATION TIE AND RAIL TONGS



FIG. 2511

These tongs are made in two styles, "A" and "B," and of high carbon steel. The points will not harm the softest wood ties or timbers, and are so designed that they will stay sharp indefinitely.



FIG. 2512

With these combination tongs the laborer can handle ties easier, handier and quicker and they protect the laborer from getting his hands or fingers pinched, or dropping the ties on his feet.

These tongs can be used for carrying ties or pulling old ones out of the track, and new ones into the track. They also can be used to transfer timber or ties from one car to another, or to carry rails. In fact they can be used any place where rails or ties have to be handled.

Prices upon application.

STONE CUTTERS TOOLS

No. 130
Chisel

FIG. 2513

No. 131
Chisel With Teeth

FIG. 2514

No. 132
Point

FIG. 2515

No. 133
Pitching Tool

FIG. 2516

PLAIN HEAD. EXTRA QUALITY STEEL

No. 130.	$\frac{1}{4}$ to 2-inch bit.....	per lb.	\$0.50
No. 131.	With teeth, $\frac{1}{4}$ to 2-inch bit.....	per lb.	.60
No. 132.	Point	per lb.	.50
No. 133.	$1\frac{1}{4}$ to $2\frac{1}{2}$ -inch bit.....	per lb.	.50

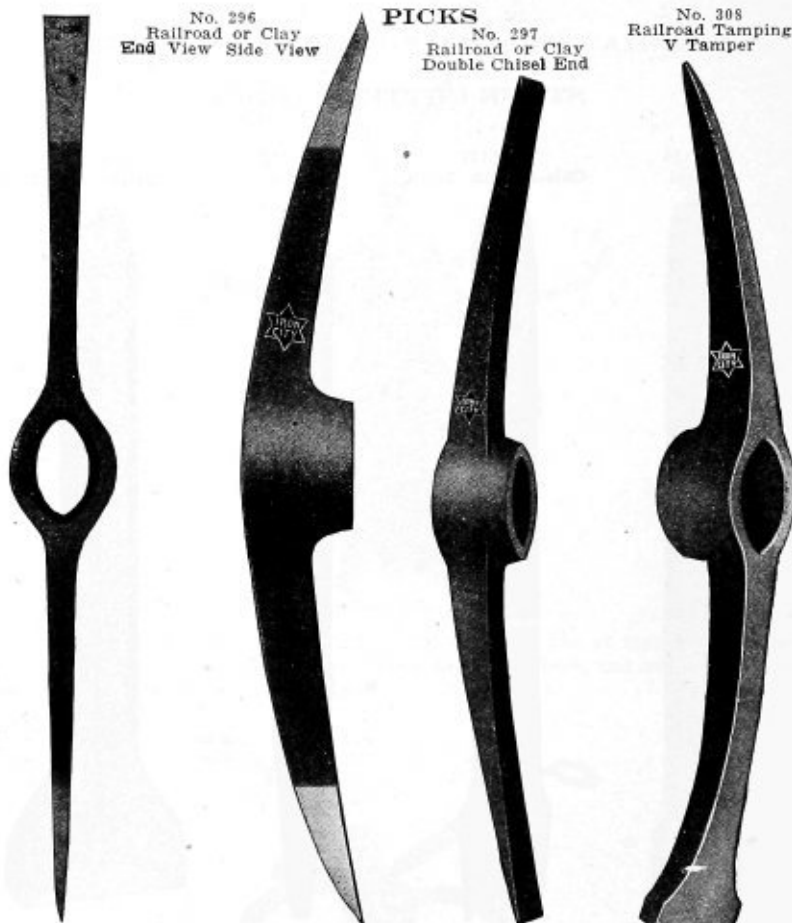


FIG. 2517

FIG. 2518

FIG. 2519

RAILROAD OR CLAY PICKS, NOS. 296 AND 297

Weights	lbs.	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10
Per dozen, assorted weights.....		\$13.00	14.00	15.00	16.00	18.00	20.00
Weight	lbs.	4	5	6	7	8	10
Per dozen, straight weights....		\$13.00	13.50	14.50	15.50	17.00	21.00

WIDE CHISEL END CLAY PICKS

Same list as above but adding for:

Chisel End—Width	inches	1½	2	2½	3
Add	per dozen	\$1.00	1.50	2.00	2.50

TAMPING PICKS, NO. 308

Weight	lbs.	6 to 7	7 to 8	8 to 9
Tamping, No. 308. Assorted weights.....	per dozen	\$18.00	19.00	20.00
Weight	lbs.	6	7	8
Tamping No. 308. Straight weights.....	per dozen	\$18.00	18.50	19.50

PICKS

No. 275
Locomotive
Coal

FIG. 2520

No. 278
Concrete
or Asphalt

FIG. 2521

No. 280
Contractors'
Adze Eye

FIG. 2522

No. 282
Drifting
Adze Eye

FIG. 2523

LOCOMOTIVE COAL PICKS NO. 275

No. 275. Weight, 4 to 5 lbs. per dozen, \$....

CONCRETE OR ASPHALT PICKS, NO. 278									
Weight	7	7½	8	8½	9	9½	10	11	
Per dozen	\$18.50	19.00	19.50	20.50	21.50	22.50	23.50	24.50	

CONTRACTORS' ADZE EYE PICKS, NO. 280

Long slim pencil points. When ordered, can furnish both points square, or square point and chisel end.

Weight	7	7½	8	8½	9	9½	10	11	
Per dozen	\$18.50	19.00	19.50	20.50	21.50	22.50	23.50	24.50	

DRIFTING PICKS, NO. 282

No.	1	1½	2	3	4	5	6		
Weight	3	3½	4	4½	5	6	7		
Per dozen	\$12.50	13.25	14.00	15.00	16.00	17.50	20.00		

MATTOCKS

Soft steel body, adze eye, with extra full weight highest grade crucible steel bits and points, polished and tempered; axe finish.



FIG. 2524

	List Per Dozen
Adze Eye, Long Cutter, 6 lbs.....	\$17.00
" " Short " 5½ "	16.50
" " Long " Light	16.00
" " Short " "	16.00
Hunt " Long " 6 lbs.....	17.00
" " Short " 5½ "	16.50
Adze Eye, Pick Mattocks.....	17.00
Hunt " " "	17.00



FIG. 2525

REGULAR ASPHALT MATTOCKS



FIG. 2526

Weight.....	Pounds	9
Size of cutter.....	Inches	9 x 2¾
List per dozen.....		\$25.00

IMPROVED ASPHALT MATTOCKS



FIG. 2527

Weight.....	Pounds	11
Size of cutter.....	Inches	9 x 2¾
List per dozen.....		\$30.00

HAZEL HOES

Width of Blade 6 inches.....per dozen, \$16.00

GRUB HOES



FIG. 2528

	List Per Dozen
Western Pattern No. 0, 3 lbs.....	\$12.50
" " " 1, 3½ "	13.00
" " " 2, 4 "	13.50
" " " 3, 4½ "	14.00

PICKS

No. 291
Ore

FIG. 2534

No. 292
Poll

FIG. 2535

No. 294
Stone

FIG. 2536

No. 295
Quarry

FIG. 2537

ORE PICKS, NO. 291

Short arms and extra strong. Regular point and chisel end. Double pointed when ordered. Extra quantity and quality of steel when ordered.

Weight	lbs.	6 to 7	7 to 8	8 to 9	9 to 10
Per dozen		\$15.00	16.00	18.00	20.00

POLL PICKS, NO. 292

Size	No.	1	2	3	4	5	6
Weight	lbs.	3½	4	4½	5	6	6¾
Per dozen		\$15.00	16.00	17.00	18.50	20.00	21.50

STONE AND QUARRY PICKS, NOS. 294 AND 295

Prices either style.

Weights	lbs.	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10
Per dozen		\$16.50	17.50	18.50	19.50	21.00

BITUMINOUS COAL PICKS

Brennen No. 261



FIG. 2538

Clearfield No. 262



FIG. 2539

Anchored No. 263



FIG. 2540

Lewis Long No. 264



FIG. 2541

Straight No. 265



FIG. 2542

See list prices for above styles on following page.

BITUMINOUS COAL PICKS—CONTINUED

River No. 266



FIG. 2543

Standard No. 267



FIG. 2544

Alton Short Ear Mining No. 268



FIG. 2545

Alton Short Ear Cutting No. 269



FIG. 2546

Alton Pattern short ear shown, long ear furnished at advanced list price of 50 cents per dozen.

Weight, lbs.	Per Dozen	Weight, lbs.	Per Dozen
1 $\frac{3}{4}$	\$8.50	4	\$10.50
2	8.50	4 $\frac{1}{2}$	11.00
2 $\frac{1}{4}$	8.50	5	11.50
2 $\frac{1}{2}$	9.00	5 $\frac{1}{2}$	12.00
2 $\frac{3}{4}$	9.50	6	12.50
3	9.50	6 $\frac{1}{2}$	13.00
3 $\frac{1}{2}$	10.00	7	14.00

STEEL BALLS



FIG. 2547

Size in Inches	List Price Per 1000 Balls	Number of Balls per Standard Package	Decimal Size	Number per Pound	Weight in Ounces
$\frac{1}{8}$	\$ 3.00	3,000	.1250	3,400	....
$\frac{5}{32}$	3.60	3,000	.1562	1,770	....
$\frac{3}{16}$	4.00	3,000	.1875	1,030	....
$\frac{7}{32}$	4.80	2,000	.2187	640	....
$\frac{1}{4}$	6.00	2,000	.2500	430	....
$\frac{5}{16}$	12.00	1,000	.3125	220	....
$\frac{3}{8}$	20.00	750	.3750	125	....
$\frac{7}{16}$	28.00	500	.4375	80	....
$\frac{1}{2}$	40.00	500	.5000	52	....
$\frac{5}{8}$	56.00	400	.5625	36	....
$\frac{3}{4}$	68.00	250	.6250	28	....
$\frac{7}{8}$	80.00	200	.6875	21	....
$\frac{15}{16}$	96.00	200	.7500	16	....
1	110.00	150	.8125	....	1 $\frac{1}{4}$
$1\frac{1}{8}$	130.00	100	.8750	....	1 $\frac{5}{8}$
$1\frac{1}{4}$	160.00	100	.9375	....	2
1 $\frac{3}{8}$	190.00	75	1.000	....	2 $\frac{3}{8}$
1 $\frac{1}{2}$	240.00	50	1.125	....	3 $\frac{1}{2}$
1 $\frac{3}{4}$	310.00	50	1.250	....	4 $\frac{3}{4}$
1 $\frac{7}{8}$	420.00	25	1.375	....	6 $\frac{1}{4}$
1 $\frac{1}{2}$	580.00	25	1.500	....	8
1 $\frac{5}{8}$	740.00	25	1.625	....	10
1 $\frac{3}{4}$	900.00	25	1.750	....	13
1 $\frac{7}{8}$	1,100.00	25	1.875	....	15 $\frac{1}{2}$
2	1,400.00	25	2.000	....	19

FILE CLEANERS



FIG. 2548

No. 1. Nicholson hardwood back and handle, varnished. List price...per doz. \$4.50



FIG. 2549

No. 3. Nicholson hardwood frame and handle, varnished. List price...per doz. \$6.75
Back bristle brush on reverse side.



FIG. 2550

No. 4. File Cleaner or File Card. The teeth are of tempered steel wire and will not turn over by coming in contact with file. Handles are hardwood, neatly finished. List price.....per doz. \$3.50



FIG. 2551

No. 10. Colton, steel back, frame, and wire bristles. Has soft steel tapered pick to remove substances imbedded deeply in teeth. List price...per doz. \$3.00

COMMON FILE HANDLES



FIG. 2552

Heavy Polished Seamless Steel Ferrules.

Nos.	1	2	3	4	5
Length	in. 4	4¼	4½	4¾	5
Diam.	in. 1	1⅛	1¼	1⅝	1⅞
Price	per gross \$3.80	4.00	4.40	4.80	5.20
Assorted sizes.....	Price per gross				4.80

"STRONGHOLD" FILE HANDLE



FIG. 2553

Made with radial slots to prevent splitting. Ferrule will not come loose.

The patent spring ferrule grips and holds the tang.

Nos.	2	3	4	5
Price	per gross \$6.00	8.00	10.00	12.00

NO. 448 FILE HANDLE



FIG. 2554

Tinned malleable iron handle and clamp; steel clamping screw, adjustable to hold any size small shank tool. Length, 5 in. Weight, per dozen, about 4 lbs.

Price.....per doz. 3.60

PRICE PER DOZEN

Inch	Half-R'd & Three Sq.			Warding			Inch	Pit Saw	Cant Saw	G. A. X-Cut	Planer Knt'e		Inserted Tooth or Chisel Tool
	B'st'r'd	2d Cut	S'm't'h	B'st'r'd	2d Cut	S'm't'h		Single Cut	Single Cut	Single Cut	Single Cut	Double Cut	
4	\$4.80	\$5.60	\$6.10	\$4.00	\$4.80	\$5.40	4	\$4.80	\$4.30	\$4.80	.....	.....	.....
5	5.40	6.10	6.40	4.50	5.30	5.80	5	5.40	4.70	5.40	.....	.....	.....
6	6.10	6.70	7.10	4.90	5.90	6.40	6	6.10	5.40	6.10	.....	.....	.....
7	7.00	7.70	8.20	5.40	6.90	7.50	7	7.00	6.10	7.00	.....	.....	.....
8	7.60	8.30	8.90	6.40	7.50	8.20	8	7.60	6.40	7.50	\$6.40	\$7.40	\$8.30
9	8.50	9.40	9.90	7.80	9.00	9.90	9	8.50	7.80	8.50	7.40	8.60	9.40
10	9.10	10.10	10.70	8.70	10.10	11.00	10	9.10	8.70	9.10	8.60	10.90	10.10
11	10.70	11.80	12.70	10.90	12.70	13.70	11	10.70	10.40	10.70	10.90	12.10	.....
12	11.80	13.00	13.90	12.30	14.30	15.40	12	11.80	11.40	11.80	12.10	14.70	.....
13	14.10	15.40	16.60	15.20	17.40	18.70							
14	15.50	17.00	18.30	17.00	19.40	21.00							
15	18.50	20.40	21.70	Stave Saw									
16	20.60	22.50	24.20	8-inch.....\$9.40			Climax, adv. 2 in. on Half-Round Bastard						
17	24.70	27.00	28.90				Round Gulletting, take Pit Saw price						
18	27.50	29.90	32.00	Stave Saw, Improved									
19	32.80	35.70	38.10	6-inch.....\$6.40									
20	36.20	39.40	42.30	7 " 7.40									
Ginsaw, take bastard price,				8 " 8.10									
Crossing ".....adv. 2 in.				9 " 9.70									
Tumbler "....." 2 "				10 " 10.70									
Feather Edge, (Blunt) "....." 2 "				12 " 15.40									
High Back Half Round "....." 2 "													
								6	7	8	9	10	
								\$3.50	3.50	3.90	4.40	4.90	

Irregular Goods, all lengths above those listed, advance 20 per cent on next lower inch price
Files varying from standard sizes, to be classed as irregular and subject to special prices.

STANDARD FILE LIST

NOVEMBER, 1899—PRICE PER DOZEN

Inch	Mill One Round Edge			Mill Two Round Edges			Inch	Tapers		Slim Tapers		Band Saw Blunt & Tapet	
	B'st'd	2d Cut	Sm'th	B'st'd	2d Cut	Sm'th		Single Cut	Double Cut	Single Cut	Double Cut	Reg'lr	Slim
4	\$3.40	\$3.90	\$4.40	\$3.80	\$4.40	\$4.90	3	\$2.10	\$2.50	\$2.10	\$2.50	\$2.50	\$2.50
5	3.60	4.30	4.60	4.00	4.80	5.10	3½	2.10	2.50	2.10	2.50	2.50	2.50
6	3.90	4.50	5.10	4.40	5.00	5.60	4	2.20	2.90	2.20	2.60	2.90	2.60
7	4.40	5.20	5.50	4.90	5.80	6.10	4½	2.40	3.10	2.30	3.00	3.10	3.00
8	4.80	5.50	6.10	5.40	6.10	6.80	5	2.60	3.50	2.50	3.20	3.50	3.20
9	5.50	6.50	7.10	6.10	7.30	7.90	5½	3.00	4.00	2.90	3.50	4.00	3.50
10	6.30	7.20	7.90	7.00	8.00	8.80	6	3.40	4.70	3.10	3.90	4.70	3.90
11	7.50	8.80	9.60	8.40	9.80	10.60	7	4.30	5.60	3.80	4.50	5.60	4.50
12	8.40	9.70	10.60	9.40	10.80	11.80	8	5.40	6.70	4.50	5.30	6.70	5.30
13	10.60	12.00	13.20	11.80	13.40	14.60	9	6.60	8.10	5.40	6.30	8.10	6.30
14	12.00	13.70	14.70	13.40	15.30	16.40	10	8.10	9.70	6.40	7.50	9.70	7.50
15	14.70	16.90	18.10	16.40	18.80	20.10	11	10.70	12.10	8.30	9.10	12.10	9.10
16	16.50	18.90	20.10	18.40	21.00	22.40	12	12.50	14.70	9.50	11.00	14.70	11.00
17	20.50	22.70	24.40	22.80	25.30	27.10	13	15.90	17.50	12.10	13.10	17.50	13.10
18	22.70	25.50	27.30	25.30	28.40	30.40	14	18.20	20.60	13.80	15.40	20.60	15.40

Inch	Horse Rasps			File Rasps		Inch	Wood Files			Wood Rasps		
	Plain	Bev'd and ½ Rasp	Tang'd	Flat	Half Round		Flat	Half Round	Cab- inet	Flat	Half Round	Cab- inet
6	.....	.....	.....	\$7.40	\$8.10	6	\$4.30	\$6.10	\$8.10	\$7.40	\$8.10	\$10.10
7	.....	.....	.....	8.60	9.30	7	4.80	7.00	9.30	8.60	9.30	11.70
8	.....	.....	.....	9.40	10.10	8	5.30	7.50	10.10	9.40	10.10	12.80
9	.....	.....	.....	11.40	12.20	9	6.30	8.50	12.20	11.40	12.20	15.50
10	\$9.40	\$10.70	\$12.80	12.80	13.70	10	7.00	9.10	13.70	12.80	13.70	17.50
11	11.40	12.90	15.20	15.50	16.80	11	8.60	10.70	16.80	15.50	16.80	20.70
12	12.80	14.40	16.80	17.50	18.70	12	9.70	11.80	18.70	17.50	18.70	22.80
13	15.20	17.00	19.60	20.90	22.40	13	11.80	14.10	22.40	20.90	22.40	26.80
14	17.80	20.10	23.10	23.20	24.80	14	13.30	15.50	24.80	23.20	24.80	29.60
15	20.90	23.60	27.30	27.80	29.70	15	16.00	18.50	29.70	27.80	29.70	33.90
16	24.40	27.50	32.20	30.80	32.90	16	17.80	20.60	32.90	30.80	32.90	36.90
17	28.90	31.50	.....	36.20	38.90	17	21.50	24.70	38.90	36.20	38.90	42.40
18	32.90	36.20	.....	40.90	43.60	18	23.90	27.50	43.60	40.90	43.60	46.90

Inch	Knife			Inch	Shoe Rasps		
	Bastard	2d Cut	Smooth		Flat	Half Round	Oval
4	\$5.40	\$6.10	\$6.40	6	\$8.10	\$8.10	\$9.30
5	6.10	6.70	7.10	7	9.30	9.30	10.10
6	6.90	7.50	7.90	8	10.10	10.10	12.20
7	7.80	8.50	8.90	9	12.20	12.20	13.70
8	8.50	9.10	9.50	10	13.70	13.70	16.80
9	9.40	10.60	11.30	11	16.80	16.80	18.70
10	10.10	11.50	12.30	12	18.70	18.70	22.40
11	12.20	13.70	14.60	13	22.40	22.40	.....
12	13.70	15.20	16.10	14	24.80	24.80	.....
13	16.80	17.90	19.20				
14	18.20	19.90	21.20				

Last Makers' Rasps
One inch advance on Cabinet Rasp

Sizes below 4 inches, not extended, take 4-inch price.
Half inches, not specified, take next higher full inch price.
Dead Smooth, double the price of Bastard Cut.
One Round Edge, advance 12½ per cent.
Blunt Files, not specified, advance one inch on respective kinds and cuts.
Single or Float Cut, not specified, on regular shapes take Double Cut price.
Equalings, (Beilled), advance two inches on respective kinds and cuts.
Two Round Edges, advance 25 per cent.
Cuts not specified, made upon regular blanks, advance one inch on respective kinds and nearest cuts.
Irregular Goods, all lengths above those listed, advance 20 per cent on next lower inch price.
Files varying from standard sizes, to be classed as Irregular and subject to special prices.

FILES

"BESTOVALL"

"Bestovall" brand files for uniformity of pattern, perfection in finish, toughness in temper and satisfactory service have no equal.

Forged from highest grade crucible steel; natural gas tempered, which gives the metal a peculiar hardening and toughness; cut in the latest improved machines; carefully tested and selected.

"FORT PITT"

Forged from special crucible steel; natural gas tempered; tested and selected.

REGULAR TAPER SAW—SINGLE CUT



FIG. 2555

Especially designed for filing hand saws.

Size	inches	2½	3	3½	4	4½	5	5½	6	7	8	10
Weight per Dozen, about lbs.		¾	1¼	1¾	2¼	3	3½	4½	5½	6½	7½	9
"Bestovall"	list, per doz.	\$2.10	2.10	2.10	2.20	2.40	2.60	3.00	3.40	4.30	5.40	8.10
"Fort Pitt"	" " "	2.10	2.10	2.10	2.20	2.40	2.60	3.00	3.40	4.30	5.40	8.10

SLIM TAPER SAW—SINGLE CUT



FIG. 2556

Especially designed for filing hand saws.

Size	inches	3	3½	4	4½	5	5½	6	7	8	10
Weight per dozen	about lbs.	¾	1¼	1¾	2¼	3	3½	4½	5½	6½	9
"Bestovall"	list, per doz.	\$2.10	2.10	2.20	2.30	2.50	2.90	3.10	3.80	4.50	6.40
"Fort Pitt"	" " "	2.10	2.10	2.20	2.30	2.50	2.90	3.10	3.80	4.50	6.40

STUBS PATTERN SAW—DOUBLE CUT TO POINT



FIG. 2557

Preferred by some in filing fine tooth hand and hack saws, also metal workers' saws, which are considerably harder than those used on wood.

Size	inches	3	3½	4	4½	5	6
Weight per dozen	about lbs.	¾	1¼	1¾	2¼	3	3½
"Bestovall"	list, per doz.	\$2.60	2.50	2.90	3.10	3.50	4.70
"Fort Pitt"	" " "	2.50	2.50	2.90	3.10	3.50	4.70

FILES—CONTINUED

DOUBLE ENDED TAPERS—SINGLE CUT

FIG. 2558

Especially designed for filing hand saws.

Size	inches	3½	4	4½	5
Weight per dozen about.....	lbs.	1	1½	2	2½
"Bestovall".....	list price, per dozen	\$3.50	3.90	4.40	4.90
"Fort Pitt".....	"	3.50	3.90	4.40	4.90

MILL BASTARD—SQUARE EDGES**FIG. 2559**

Used principally for sharpening Mill Saws; also Mowing Machine knives and plows; in machine shops for lathe work, draw-filing, etc.

Size	inches	3	4	5	6	7	8	9	10	11	12	13	14	16
Weight per dozen about.....	lbs.	¾	¾	1	1½	2	4	4½	6	8	12	14	15	22
"Bestovall".....	list price, per doz.	\$3.00	3.00	3.20	3.50	3.90	4.30	4.90	5.60	6.70	7.50	9.40	10.70	14.70
"Fort Pitt".....	"	3.00	3.00	3.20	3.50	3.90	4.30	4.90	5.60	6.70	7.50	9.40	10.70	14.70

MILL BASTARD—SQUARE AND ROUND EDGES**FIG. 2560**

Used principally for sharpening Mill Saws; also Mowing Machine knives and plows; in machine shops for lathe work, draw-filing, and, to some extent, finishing the several compositions of brass and bronze.

Size	inches	6	8	10	12
Weight per dozen about.....	lbs.	1½	4	6	12
"Bestovall".....	list price, per dozen	\$3.90	4.80	6.30	8.40
"Fort Pitt".....	"	3.90	4.80	6.30	8.40

MILL BASTARD—ROUND EDGES**FIG. 2561**

Size	inches	6	8	10	12
Weight per dozen about.....	lbs.	1½	4	6	12
"Bestovall".....	list price, per dozen	\$4.40	5.40	7.00	9.40
"Fort Pitt".....	"	4.40	5.40	7.00	9.40

MILL 2D CUT**FIG. 2562**

Size	inches	6	8	10	12	14	16
Weight per dozen about.....	lbs.	1½	3	6	12	15	22
"Bestovall".....	list price, per dozen	\$4.00	4.90	6.40	8.00	12.20	16.80
"Fort Pitt".....	"	4.00	4.90	6.40	8.00	12.20	16.80

FILES—CONTINUED

FLAT BASTARD



FIG. 2563

Inches	3	4	5	6	7	8	9	10
Weight per dozen about.....lbs.	$\frac{1}{4}$	$\frac{3}{8}$	1	$1\frac{1}{4}$	3	4	6	$7\frac{1}{4}$
"Bestoval".....per doz.	\$3.70	3.70	3.90	4.30	4.80	5.30	6.30	7.00
"Fort Pitt"....." "	3.70	3.70	3.90	4.30	4.80	5.30	6.30	7.00

Inches	11	12	13	14	15	16	18	.....
Weight per dozen about.....lbs.	10	13	16	19	24	27	39	.....
"Bestoval".....per doz.	8.60	9.70	11.80	13.30	16.00	17.80	23.90	.....
"Fort Pitt"....." "	8.60	9.70	11.80	13.30	16.00	17.80	23.90	.....

FLAT SMOOTH

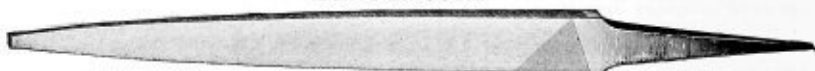


FIG. 2564

Inches	3	4	6	8	10	12	14	16
Weight per dozen about.....lbs.	$\frac{1}{4}$	$\frac{1}{2}$	$1\frac{1}{4}$	$2\frac{1}{4}$	7	12	18	27
"Bestoval".....per doz.	\$4.70	4.70	5.30	6.60	8.70	12.10	16.70	22.30
"Fort Pitt"....." "	4.70	4.70	5.30	6.60	8.70	12.10	16.70	22.30

FLAT 2D CUT



FIG. 2565

Inches	6	8	10	12	14	16
Weight per dozen about.....lbs.	$1\frac{3}{4}$	$3\frac{1}{2}$	7	12	14	28
"Bestoval".....list, per doz.	\$4.80	6.10	8.10	11.00	15.30	20.10
"Fort Pitt"....." "	4.80	6.10	8.10	11.00	15.30	20.10

HAND BASTARD—ONE SAFE EDGE



FIG. 2566

Inches	8	10	12	14	16
Weight per dozen about.....lbs.	5	10	15	22	36
"Bestoval".....list, per doz.	\$5.40	7.50	10.70	15.00	20.10
"Fort Pitt"....." "	5.40	7.50	10.70	15.00	20.10

HAND 2D CUT—ONE SAFE EDGE

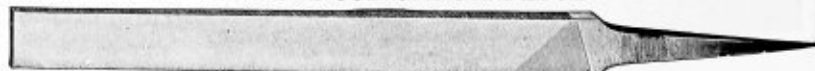
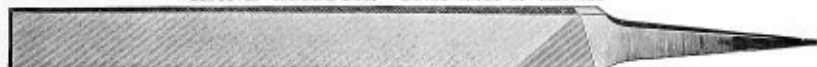


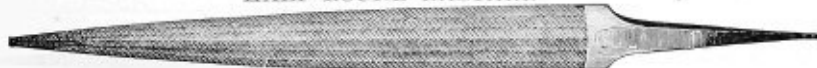
FIG. 2567

Inches	8	10	12
Weight per dozen about.....lbs.	5	9	15
"Bestoval".....list per doz.	\$6.30	8.70	12.30
"Fort Pitt"....." "	6.30	8.70	12.30

FILES—CONTINUED
HAND SMOOTH ONE SAFE EDGE

**FIG. 2568**

Inches	8	10	12	14
Weight, per dozen, about.....lbs.	5	9	75	23
"Bestovall".....list, per doz.	\$6.70	9.40	13.50	18.20
"Fort Pitt"....." "	6.70	9.40	13.50	18.20

HALF ROUND BASTARD**FIG. 2569**

Inches	3	4	5	6	7	8
Weight, per dozen, about.....lbs.	$1\frac{1}{4}$	$1\frac{1}{2}$	1	$1\frac{1}{2}$	$2\frac{1}{4}$	4
"Bestovall".....list, per doz.	\$4.80	4.80	5.40	6.10	7.00	7.50
"Fort Pitt"....." "	4.80	4.80	5.40	6.10	7.00	7.50

Inches	9	10	11	12	14	16
Weight, per dozen, about.....lbs.	5	6	9	12	17	25
"Bestovall".....list, per doz.	\$8.50	9.10	10.70	11.80	15.50	20.60
"Fort Pitt"....." "	8.50	9.10	10.70	11.80	15.50	20.60

HALF ROUND SMOOTH**FIG. 2570****HAS A WIDE USE IN THE MACHINE SHOP**

Inches	4	6	8	10	12	14	16
Weight, per dozen, about.....lbs.	$1\frac{1}{2}$	$1\frac{1}{2}$	4	6	11	17	25
"Bestovall".....list, per doz.	\$6.10	7.10	8.90	10.70	13.90	18.30	24.20
"Fort Pitt"....." "	6.10	7.10	8.90	10.70	13.90	18.30	24.20

HALF ROUND 2D CUT**FIG. 2571**

Inches	6	8	10	12	14	16
Weight, per dozen, about.....lbs.	$1\frac{1}{2}$	4	6	12	17	25
"Bestovall".....list, per doz.	\$6.70	8.30	10.10	13.00	17.00	22.50
"Fort Pitt"....." "	6.70	8.30	10.10	13.00	17.00	22.50

HALF ROUND CAB. FILES**FIG. 2572****USED BY CABINET MAKERS AND OTHER WOOD WORKERS GENERALLY**

Inches	10	12	14
Weight, per dozen, about.....lbs.	5	9	14
"Bestovall".....list, per doz.	\$13.70	18.70	24.80
"Fort Pitt"....." "	13.70	18.70	24.80

FILES—CONTINUED

SQUARE BASTARD

FIG. 2573

Used in almost all branches of mechanical industry, principally for enlarging apertures of a square or rectangular shape.

Inches.....	4	6	8	10	12	14	16	18
Weight per dozen about.....lbs.	$\frac{1}{2}$	1	$2\frac{1}{4}$	4	9	16	27	36
"Bestovall".....list per dozen	\$3.80	4.60	5.50	7.40	10.20	13.90	18.70	25.10
"Fort Pitt"....." " "	3.80	4.60	5.50	7.40	10.20	13.90	18.70	25.10

ROUND BASTARD

FIG. 2574

For enlarging round holes and shaping internal angles which are filled in, for which use the quadrangular section would be unsuitable.

Inches.....	3	4	5	6	7	8	10	11	12	14	16
Weight per doz. about.....lbs.	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$3\frac{1}{4}$	6	7	13	21
"Bestovall".....list per doz.	\$3.00	3.00	3.20	3.50	3.90	4.30	5.60	6.70	7.50	10.70	14.70
"Fort Pitt"....." " "	3.00	3.00	3.20	3.50	3.90	4.30	5.60	6.70	7.50	10.70	14.70

PIT SAW FILES

FIG. 2575

For filing the teeth of what are known as pit and frame saws.

Inches.....	6	8
Weight per dozen about.....lbs.	$1\frac{3}{4}$	$3\frac{1}{2}$
"Bestovall".....list per dozen	\$6.10	7.50
"Fort Pitt"....." " "	6.10	7.50

BLUNT SAW FILES

FIG. 2576

Used for filing saws, having M shaped teeth.

Inches.....	5	6	8	10
Weight per dozen about.....lbs.	1	$1\frac{1}{2}$	3	5
"Bestovall".....list per dozen	\$4.70	5.40	6.40	8.70
"Fort Pitt"....." " "	4.70	5.40	6.40	8.70

GREAT AMERICAN CROSS CUT SAW FILES

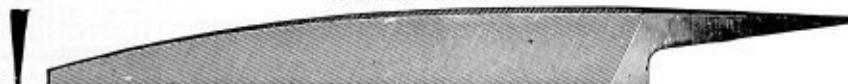
FIG. 2577

Inches.....	7	8	10
Weight per dozen about.....lbs.	2	4	$6\frac{1}{2}$
"Bestovall".....list per dozen	\$7.00	7.50	9.10
"Fort Pitt"....." " "	7.00	7.50	9.10

FILES—CONTINUED
BAND SAW FILES. BLUNT, SLIM

**FIG. 2578**

Inches	5	6	8
Weight, per dozen.....about lbs.	1	1 1/4	3
"Bestovall".....list per doz.	\$3.20	\$3.90	\$5.30
"Fort Pitt"....." " "	3.20	3.90	5.30

KNIFE BASTARD**FIG. 2579**

Inches	4	5	6
Weight, per dozen.....about lbs.	3/4	1	1 1/4
"Bestovall".....list, per doz.	\$5.40	\$6.10	\$6.90
"Fort Pitt"....." " "	5.40	6.10	6.90

WARDING BASTARD**FIG. 2580**

Inches	3	4	5	6
Weight, per dozen.....about lbs.	1 1/4	1 1/2	1 3/4	1
"Bestovall".....list, per doz.	\$4.00	\$4.00	\$4.50	\$4.90
"Fort Pitt"....." " "	4.00	4.00	4.50	4.90

WARDING 2D CUT**FIG. 2581**

Inches	3	4	5	6
Weight, per dozen.....about lbs.	1 1/4	1 1/2	1 3/4	1
"Bestovall".....list, per dozen	\$4.80	\$4.80	\$5.30	\$5.90
"Fort Pitt"....." " "	4.80	4.80	5.30	5.90

FLAT WOOD FILE**FIG. 2582**

Inches	10	12
Weight, per dozen.....about lbs.	6	10
"Bestovall".....list, per dozen	\$7.00	\$9.70
"Fort Pitt"....." " "	7.00	9.70

FILES—CONTINUED

HALF ROUND WOOD RASPS



FIG. 2583

Used principally by wheelwrights and carriage builders and to some extent by plumbers and marbleworkers.

Inches	10	12	14
Weight per dozen about.....lbs.	8	10	18
"Bestovall," List.....per dozen	\$13.70	18.70	24.90
"Fort Pitt".....	13.70	18.70	24.90

FLAT WOOD RASPS



FIG. 2584

Inches	10	12	14
Weight per dozen about.....lbs.	8	12	17
"Bestovall," List.....per dozen	\$12.80	17.50	23.20
"Fort Pitt".....	12.80	17.50	23.20

TANGED HORSE RASP— $\frac{1}{2}$ FILE

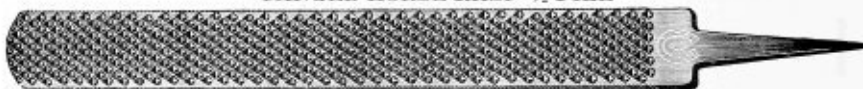


FIG. 2585

Used by horseshoers.

Inches	14	16
Weight per dozen about.....lbs.	30	40
"Bestovall," List.....per dozen	\$25.10	32.20

HORSE RASP— $\frac{1}{2}$ FILE

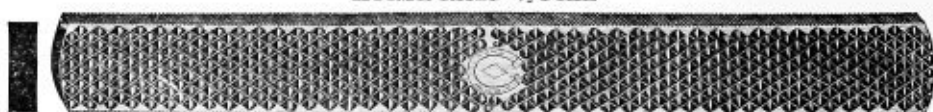


FIG. 2586

Inches	10	12	14	15	16	18
Weight per dozen about.....lbs.	10	16	22	24	29	34
"Bestovall," List.....per dozen	\$9.40	12.80	17.80	20.90	24.40	32.10
"Fort Pitt".....	9.40	12.80	17.80	20.90	24.40	32.10

HALF ROUND SHOE RASP— $\frac{1}{4}$ FILE

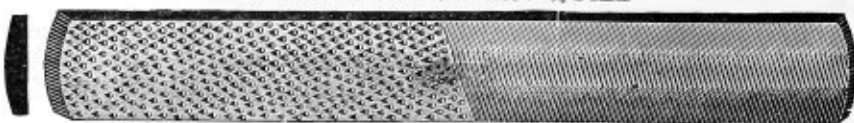


FIG. 2587

Inches	8
Weight per dozen about.....lbs.	8
"Bestovall," List.....per dozen	\$10.10
"Fort Pitt".....	10.10

SWISS PATTERN FILE

LIST OF NOV. 1st, 1913.

PRICE PER DOZEN.

HAND.							PILLAR, PILLAR NARROW, PILLAR EXTRA NARROW.							3-SQUARE AND METAL SAW.							KNIFE.							WARDING.						
No.	00-2	3-4	5	6	7	8	No.	00-2	3-4	5-6	7-8	No.	00-2	3-5	6-8	No.	00-2	3-4	5-6	No.	00-2	3-4	5-6	No.	00-2	3-4	5-6	7-8						
3431	1.85	1.65	2.05	2.80	3.35	3.50	3431	1.65	1.20	1.75	1.85	31	1.75	1.75	1.75	31	1.15	1.75	1.75	31	1.15	1.75	1.75	31	1.50	1.65	1.75	1.95						
2	2.20	1.90	2.30	3.00	3.55	3.70	2	1.85	1.25	2.05	2.15	32	2.20	2.35	2.50	32	2.30	2.35	2.50	32	2.30	2.40	2.50	32	1.85	1.95	2.10	2.25						
3	2.45	2.60	2.75	3.00	3.25	3.50	3	2.10	2.20	2.35	2.45	33	2.40	2.55	2.70	33	2.40	2.55	2.70	33	2.40	2.55	2.70	33	1.85	1.95	2.10	2.25						
4	2.70	2.85	3.00	3.25	3.50	3.75	4	2.35	2.50	2.65	2.75	34	2.60	2.75	2.90	34	2.60	2.75	2.90	34	2.60	2.75	2.90	34	2.00	2.10	2.20	2.30						
5	3.15	3.35	3.55	3.85	4.25	4.55	5	2.75	2.85	3.00	3.35	4	2.85	3.00	3.20	4	3.30	3.40	3.55	4	3.30	3.40	3.55	4	2.20	2.35	2.45	2.55						
6	3.45	3.65	3.95	4.40	4.75	5.05	6	3.30	3.50	3.70	3.90	5	3.40	3.65	3.90	5	3.85	4.00	4.20	5	3.85	4.00	4.20	5	2.40	2.55	2.70	2.85						
7	4.10	4.30	4.65	5.25	5.85	6.05	7	4.05	4.40	4.75	5.05	6	4.15	4.50	4.85	6	4.40	4.75	5.10	6	4.40	4.75	5.10	6	2.60	2.80	3.00	3.20						
8	4.50	4.75	5.05	5.65	6.25	6.45	8	4.50	5.00	5.60	6.05	7	4.60	5.10	5.65	7	4.80	5.30	5.85	7	4.80	5.30	5.85	7	2.80	3.05	3.30	3.55						
9	5.25	5.50	5.85	6.60	7.35	7.55	9	5.25	5.80	6.60	7.15	8	5.30	5.95	6.80	8	5.60	6.25	7.10	8	5.60	6.25	7.10	8	3.00	3.30	3.60	3.90						
10	5.55	5.90	6.30	7.20	8.10	8.30	10	5.55	6.20	7.20	7.75	9	5.60	6.35	7.40	9	6.00	6.75	7.90	9	6.00	6.75	7.90	9	3.20	3.55	3.95	4.30						
12	6.10	6.50	7.00	8.10	9.25	9.50	12	6.10	6.80	8.10	8.65	10	6.15	6.95	8.25	10	6.50	7.35	8.70	10	6.50	7.35	8.70	10	3.40	3.80	4.30	4.70						
14	6.65	7.10	7.65	8.90	10.25	10.50	14	6.65	7.40	8.90	9.45	12	6.70	7.55	9.00	12	7.10	8.05	9.50	12	7.10	8.05	9.50	12	3.60	4.10	4.65	5.10						
INCHES							2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	10	12	14	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
Width in Decimal parts of an inch stated as near as practicable.							11	11 1/2	12	12 1/2	13	13 1/2	14	15	16	17	18	20	22	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
							21	21 1/2	22	22 1/2	23	23 1/2	24	25	26	27	28	30	32	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
							31	31 1/2	32	32 1/2	33	33 1/2	34	35	36	37	38	40	42	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
							41	41 1/2	42	42 1/2	43	43 1/2	44	45	46	47	48	50	52	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
							51	51 1/2	52	52 1/2	53	53 1/2	54	55	56	57	58	60	62	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
							61	61 1/2	62	62 1/2	63	63 1/2	64	65	66	67	68	70	72	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
							71	71 1/2	72	72 1/2	73	73 1/2	74	75	76	77	78	80	82	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
							81	81 1/2	82	82 1/2	83	83 1/2	84	85	86	87	88	90	92	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
							91	91 1/2	92	92 1/2	93	93 1/2	94	95	96	97	98	100	102	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
							101	101 1/2	102	102 1/2	103	103 1/2	104	105	106	107	108	110	112	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
							111	111 1/2	112	112 1/2	113	113 1/2	114	115	116	117	118	120	122	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
							121	121 1/2	122	122 1/2	123	123 1/2	124	125	126	127	128	130	132	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
							131	131 1/2	132	132 1/2	133	133 1/2	134	135	136	137	138	140	142	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
							141	141 1/2	142	142 1/2	143	143 1/2	144	145	146	147	148	150	152	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
							151	151 1/2	152	152 1/2	153	153 1/2	154	155	156	157	158	160	162	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
							161	161 1/2	162	162 1/2	163	163 1/2	164	165	166	167	168	170	172	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
							171	171 1/2	172	172 1/2	173	173 1/2	174	175	176	177	178	180	182	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
							181	181 1/2	182	182 1/2	183	183 1/2	184	185	186	187	188	190	192	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
							191	191 1/2	192	192 1/2	193	193 1/2	194	195	196	197	198	200	202	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
							201	201 1/2	202	202 1/2	203	203 1/2	204	205	206	207	208	210	212	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
							211	211 1/2	212	212 1/2	213	213 1/2	214	215	216	217	218	220	222	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
							221	221 1/2	222	222 1/2	223	223 1/2	224	225	226	227	228	230	232	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
							231	231 1/2	232	232 1/2	233	233 1/2	234	235	236	237	238	240	242	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
							241	241 1/2	242	242 1/2	243	243 1/2	244	245	246	247	248	250	252	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
							251	251 1/2	252	252 1/2	253	253 1/2	254	255	256	257	258	260	262	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
							261	261 1/2	262	262 1/2	263	263 1/2	264	265	266	267	268	270	272	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
							271	271 1/2	272	272 1/2	273	273 1/2	274	275	276	277	278	280	282	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
							281	281 1/2	282	282 1/2	283	283 1/2	284	285	286	287	288	290	292	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
							291	291 1/2	292	292 1/2	293	293 1/2	294	295	296	297	298	300	302	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														

HAND.							PILLAR, PILLAR NARROW, PILLAR EXTRA NARROW.							3-SQUARE AND METAL SAW.							KNIFE.							WARDING.						
No.	00-2	3-4	5	6	7	8	No.	00-2	3-4	5-6	7-8	No.	00-2	3-5	6-8	No.	00-2	3-4	5-6	No.	00-2	3-4	5-6	No.	00-2	3-4	5-6	7-8						
3431	1.85	1.65	2.05	2.80	3.35	3.50	3431	1.65	1.20	1.75	1.85	31	1.75	1.75	1.75	31	1.15	1.75	1.75	31	1.15	1.75	1.75	31	1.50	1.65	1.75	1.95						
2	2.20	1.90	2.30	3.00	3.55	3.70	2	1.85	1.25	2.05	2.15	32	2.20	2.35	2.50	32	2.30	2.35	2.50	32	2.30	2.40	2.50	32	1.85	1.95	2.10	2.25						
3	2.45	2.60	2.75	3.00	3.25	3.50	3	2.10	2.20	2.35	2.45	33	2.40	2.55	2.70	33	2.40	2.55	2.70	33	2.40	2.55	2.70	33	1.85	1.95	2.10	2.25						
4	2.70	2.85	3.00	3.25	3.50	3.75	4	2.35	2.50	2.65	2.75	34	2.60	2.75	2.90	34	2.60	2.75	2.90	34	2.60	2.75	2.90	34	2.00	2.10	2.20	2.30						
5	3.15	3.35	3.55	3.85	4.25	4.55	5	2.75	2.85	3.00	3.35	4	2.85	3.00	3.20	4	3.30	3.40	3.55	4	3.30	3.40	3.55	4	2.20	2.35	2.45	2.55						
6	3.45	3.65	3.95	4.40	4.75	5.05	6	3.30	3.50	3.70	3.90	5	3.40	3.65	3.90	5	3.85	4.00	4.20	5	3.85	4.00	4.20	5	2.40	2.55	2.70	2.85						
7	4.10	4.30	4.65	5.25	5.85	6.05	7	4.05	4.40	4.75	5.05	6	4.15	4.50	4.85	6	4.40	4.75	5.10	6	4.40	4.75	5.10	6	2.60	2.80	3.00	3.20						
8	4.50	4.75	5.05	5.65	6.25	6.45	8	4.50	5.00	5.60	6.05	7	4.60	5.10	5.65	7	4.80	5.30	5.85	7	4.80	5.30	5.85	7	2.80	3.05	3.30	3.55						
9	5.25	5.50	5.85	6.60	7.35	7.55	9	5.25	5.80	6.60	7.15	8	5.30	5.95	6.80	8	5.60	6.25	7.10	8	5.60	6.25	7.10	8	3.00	3.30	3.60	3.90						
10	5.55	5.90	6.30	7.20	8.10	8.30	10	5.55	6.20	7.20	7.75	9	5.60	6.35	7.40	9	6.00	6.75	7.90	9	6.00	6.75	7.90	9	3.20	3.55	3.95	4.30						
12	6.10	6.50	7.00	8.10	9.25	9.50	12	6.10	6.80	8.10	8.65	10	6.15	6.95	8.25	10	6.50	7.35	8.70	10	6.50	7.35	8.70	10	3.40	3.80	4.30	4.70						
14	6.65	7.10	7.65	8.90	10.25	10.50	14	6.65	7.40	8.90	9.45	12	6.70	7.55	9.00	12	7.10	8.05	9.50	12	7.10	8.05	9.50	12	3.60	4.10	4.65	5.10						
INCHES							2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	10	12	14	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
Width in Decimal parts of an inch stated as near as practicable.							11	11 1/2	12	12 1/2	13	13 1/2	14	15	16	17	18	20	22	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
							21	21 1/2	22	22 1/2	23	23 1/2	24	25	26	27	28	30	32	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
							31	31 1/2	32	32 1/2	33	33 1/2	34	35	36	37	38	40	42	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
							41	41 1/2	42	42 1/2	43	43 1/2	44	45	46	47	48	50	52	Pillar, Pillar Narrow, and Pillar Extra Narrow, with or without edge cut, also with one or two side edges.														
							51	51 1/2	52	52 1/2	53	53 1/2	54	55	56	57	58	60	62</															

SWISS PATTERN FILES

4 INCH ROUND NO.0.



FIG. 2588

4 INCH METAL SAW NO.1.



FIG. 2589

4 INCH HALF ROUND NO.1.

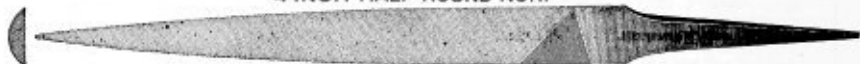


FIG. 2590

4 INCH BARRETTE NO.2.



FIG. 2591

4 INCH EXTRA NARROW PILLAR NO.2.



FIG. 2592

4 INCH THREE SQUARE NO.2.



FIG. 2593

4 INCH SQUARE NO.3.



FIG. 2594

4 INCH NARROW PILLAR NO.3.

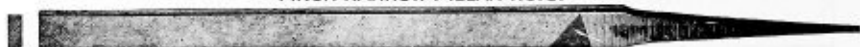


FIG. 2595

4 INCH PILLAR NO. 4.



FIG. 2596

4 INCH ROUND STRAIGHT NO.4.



FIG. 2597

4 INCH CROSSING NO.5.



FIG. 2598

4 INCH HAND NO.6.



FIG. 2599

SWISS PATTERN FILES

—CONTINUED.

ONE SET OF 12 ASSORTED 3½ INCH DIE SINKERS FILES.

OVAL.

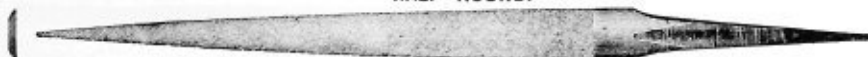
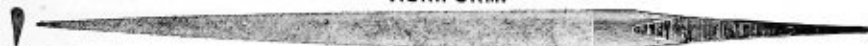
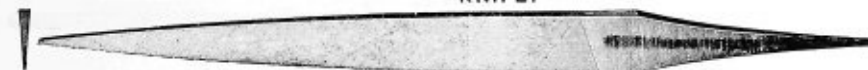
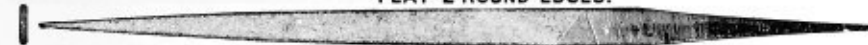
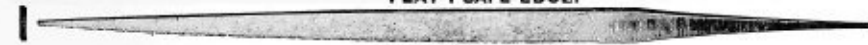
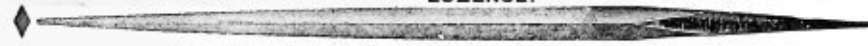
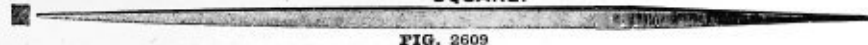
FIG. 2600
HALF ROUND.FIG. 2601
ROUND.FIG. 2602
FLAT.FIG. 2603
AURIFORM.FIG. 2604
OVAL | SHARP EDGE.FIG. 2605
KNIFE.FIG. 2605A
FLAT 2 ROUND EDGES.FIG. 2606
FLAT | SAFE EDGE.FIG. 2607
LOZENGE.FIG. 2608
SQUARE.FIG. 2609
THREE SQUARE.

FIG. 2610

SWISS PATTERN FILES

—CONTINUED.

ASSORTED SET OF TWELVE 5½ INCH SQUARE HANDLE NEEDLE OR ESCAPEMENT FILES
HALF ROUND BLUNT.

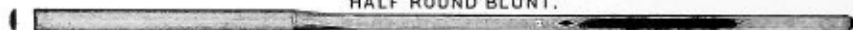


FIG. 2611

FLAT.



FIG. 2612

EQUALING.



FIG. 2613

JOINT.

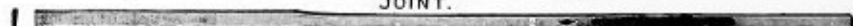


FIG. 2614

SLITTING.



FIG. 2615

KNIFE.

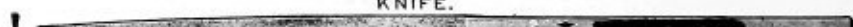


FIG. 2616

SQUARE.

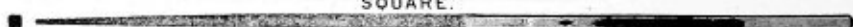


FIG. 2617

ROUND.



FIG. 2618

OVAL



FIG. 2619

3 SQUARE.



FIG. 2620

BARRETTE.

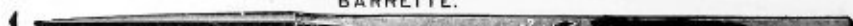


FIG. 2621

HALF ROUND.



FIG. 2622

SWISS PATTERN FILES

—CONTINUED.

SET OF 6 1/4 INCH ROUND HANDLE NEEDLE FILES.

ROUND.



FIG. 2623

HALF ROUND.

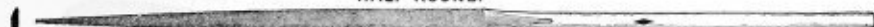


FIG. 2624

FLAT.

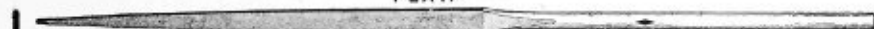


FIG. 2625

OVAL.



FIG. 2626

KNIFE.

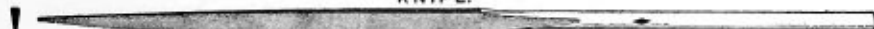


FIG. 2627

SQUARE.

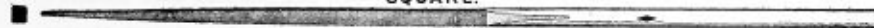


FIG. 2628

THREE SQUARE.



FIG. 2629

EQUALLING.



FIG. 2630

BARRETTE.



FIG. 2631

JOINT.

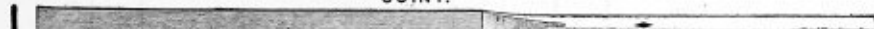


FIG. 2632

SLITTING.



FIG. 2633

MARKING.

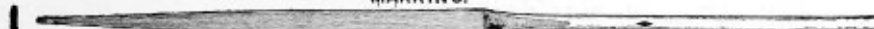


FIG. 2634

VIXEN FILES

Flat



FIG. 2635

Pillar



FIG. 2636

Half-Round, Complete, With Back and Handle



FIG. 2637

The flat Vixen Files are now made in the ordinary tang pattern, conforming very closely in size to the ordinary file, and do not require the special back and handle as heretofore. This applies to the flat files only, the half-round files still being made in the original pattern requiring the special back and handle.

Vixen Regular Cut corresponds to ordinary "bastard" cut and used on all classes of rough work—cast iron, soft steel, copper, brass, aluminum and soft metals. Also excellent for wood, slate, marble, fibre, rubber, etc.

Vixen Fine Cut should be used on all work where ordinary "bastard" and "second cut" files are used, such as hard metals—steel, cast iron, phosphor-bronze, white brass, etc.

Vixen Smooth Cut is used where amount of metal to be removed is slight and also where superior finish is desired. Excellent for lathe work.

Vixen Dead-Smooth Cut is for die and tool work and finishing hard metals.

Vixen Utility File has regular cut on one side and smooth on the other. Valuable as equipment for automobile, motor boat, machinist's kit, household tool chest, etc.

Vixen Babbitt Files are coarser than regular cut.

Price Per Dozen—In Effect September 1, 1917

DESCRIPTION	FLAT, PILLAR AND FLEXIBLE							HALF ROUND						
Size inches	8	10	12	14	16	18		8	10	12	14	16	18	
Regular	\$10.50	13.10	15.80	18.90	22.60	27.30		\$8.50	10.50	12.90	15.60	18.80	23.00	
Fine	12.60	15.20	17.90	21.00	24.70	29.40		10.00	12.00	14.40	17.10	20.30	24.50	
Smooth	13.70	16.30	18.90	22.00	25.70	30.40		10.80	12.80	15.20	17.90	21.10	25.30	
Dead smooth	14.70	18.40	22.00	26.20	29.90	34.60		11.80	14.80	18.20	21.90	25.10	29.30	
Utility	12.00	14.70	17.30	20.50	24.00	....		....	....	....	....	....	....	
Babbitt .....	....	....	19.40	21.50	....	....		....	....	....	....	....	....	
Resharpener	1.10	1.30	1.60	1.90	2.30	2.70		1.10	1.30	1.60	1.90	2.30	2.70	
Surface Holders..	12.00	12.00	13.50	13.50	15.00	15.00		12.00	12.00	13.50	13.50	15.00	15.00	
Backs	6.00	6.50	7.00	7.50	8.00	8.50		6.00	6.50	7.00	7.50	8.00	8.50	
Bolts and Nuts per doz. sets (2 bolts —2 nuts in one set)	2.00	2.00	2.00	2.50	2.50	2.50		2.00	2.00	2.00	2.50	2.50	2.50	

RESHARPENING

The Vixen File after becoming dulled may be resharpened from four to six times, depending upon the grade of cut (number of teeth per inch) and how much the teeth have been worn after becoming dull. Transportation charges to be paid by the customer.

COLD CHISELS

Tool Steel

Hand Forged



FIG. 2638

No. 280. Natural finish.

No. 282. Polished taper ebony shank.

Size, oct. steel.....in.	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
Length.....in.	5	5	5	6	6 $\frac{3}{4}$	7 $\frac{1}{2}$	8	8
Wt. per doz. about.....lbs.	$\frac{3}{4}$	1 $\frac{1}{2}$	2 $\frac{1}{4}$	4	7	11	15	20
No. 280.....per doz.	\$1.40	1.50	1.70	2.00	2.90	4.50	7.00	8.00
No. 282.....per doz.	1.40	1.50	1.70	2.00	2.90	4.50	7.00	8.00

CAPE CHISELS

Tool Steel

Hand Forged



FIG. 2639

No. 288. Natural finish.

No. 290. Polished taper, ebony shank.

Size, oct. steel.....in.	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
Size cutting edge.....in.	$\frac{1}{16}$	$\frac{3}{32}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
Length.....in.	5	5 $\frac{1}{2}$	5 $\frac{1}{2}$	6 $\frac{1}{2}$	7 $\frac{1}{2}$	8	8 $\frac{1}{2}$	9
Wt. per doz., about.....lbs.	$\frac{3}{4}$	1 $\frac{1}{2}$	2	3 $\frac{3}{4}$	7	10	15	20
No. 288.....per doz.	\$1.40	1.50	1.70	2.00	2.90	4.50	7.00	8.00
No. 290.....per doz.	1.40	1.50	1.70	2.00	2.90	4.50	7.00	8.00

HALF ROUND NOSE CHISELS

Crucible Tool Steel

Hand Forged



FIG. 2640

No. 296. Natural finish.

No. 298. Polished taper, ebony shank.

Size Octagon steel.....in.	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
Size point.....in.	$\frac{3}{32}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{1}{2}$
No. 296.....per doz.	\$1.65	1.90	3.60	4.00	5.00
No. 298.....per doz.	1.65	1.90	3.60	4.00	5.00

KEY SEATING CHISELS

Crucible Tool Steel

Hand Forged



FIG. 2641

No. 304. Natural finish.

No. 306. Polished taper, ebony shank.

Size Octagon steel.....in.	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
Size point.....in.	$\frac{3}{32}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{1}{2}$
No. 304.....per doz.	\$1.65	1.90	3.60	4.00	5.00
No. 306.....per doz.	1.65	1.90	3.60	4.00	5.00

DIAMOND POINT CHISELS

Crucible Tool Steel

Hand Forged



FIG. 2642

No. 312. Natural Finish.

No. 314. Polished Taper, Ebony Shank.

Size Octagon Steel, inch.....	$\frac{1}{16}$	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
Size Point, inch.....	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
No. 312. Per dozen	\$1.65	1.90	3.60	4.00	5.00	7.00	8.00
No. 314. Per dozen	1.65	1.90	3.60	4.00	5.00	7.00	8.00

CHIPPING CHISELS

Crucible Tool Steel

Hand Forged



FIG. 2643

No. 320. Natural Finish.

No. 322. Polished Taper, Ebony Shank.

Size Octagon Steel, inch.....	$\frac{1}{16}$	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$
Length, inches	5	5	6	$6\frac{3}{4}$	$7\frac{1}{2}$	8
Weight per dozen, about, pounds.....	$1\frac{1}{2}$	$2\frac{1}{4}$	4	7	11	15
No. 320. Per dozen	\$1.50	1.70	2.00	2.90	4.50	7.00
No. 322. Per dozen	1.50	1.70	2.00	2.90	4.50	7.00

PACKING CHISELS

Cast Steel

Hand Forged



FIG. 2644

Size Octagon Steel, inch.....	$\frac{3}{4}$
Length over all, inch.....	8
Width Blade, inch.....	$1\frac{1}{2}$
Thickness of Blade, inch.....	$\frac{3}{4}$
Length of Blade, ins.....	2
No. 520. Natural Finish, per doz.....	\$4.50

PLUMBERS' YARNING TOOLS

Cast Steel

Hand Forged



FIG. 2645

Size Octagon Steel, inch.....	$\frac{5}{8}$	$\frac{3}{4}$
Length Shanks, inch.....	5	5
Length Blades, assorted, inch.....	5 to 10	5 to 10
No. 528. Natural Finish, per doz.....	\$3.60	4.00

TINNERS' PRICK PUNCHES

Crucible Tool Steel

Hand Forged

**FIG. 2646**

No. 450. Natural finish.

No. 452. Polished taper, ebony shank.

Size octagon steel.....	in.	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$
Length	in.	4 $\frac{3}{4}$	5	5 $\frac{1}{2}$	6	6
No. 450	per doz.	\$1.20	1.44	1.56	1.68	1.80
No. 452	per doz.	1.20	1.44	1.56	1.68	1.80

MACHINISTS' CENTER PUNCHES

Crucible Tool Steel

Hand Forged

**FIG. 2647**

No. 458. Natural finish.

No. 460. Polished taper, ebony shank.

Size octagon steel.....	in.	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	
Length	in.	5	5	5	5 $\frac{1}{4}$	
No. 458	per doz.	\$1.20	1.44	1.56	1.68	
No. 460	per doz.	1.20	1.44	1.56	1.68	

MACHINISTS' SOLID PUNCHES

Crucible Tool Steel

Hand Forged

**FIG. 2648**

No. 466. Natural finish.

No. 468. Polished taper, ebony shank.

Size octagon steel.....	in.	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
Length	in.	5	5	5 $\frac{1}{2}$	6	6	6 $\frac{1}{2}$
Size point	in.	$\frac{3}{16}$	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{7}{16}$	$\frac{1}{4}$	$\frac{3}{8}$
No. 466	per doz.	\$1.20	1.44	1.56	1.68	1.80	2.00
No. 468	per doz.	1.20	1.44	1.56	1.68	1.80	2.00

MACHINISTS' DRIFT PUNCHES

Crucible Tool Steel

Hand Forged

**FIG. 2649**

No. 474. Natural finish.

No. 476. Polished taper, ebony shank.

Size octagon steel.....	in.	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	
Length	in.	4 $\frac{1}{2}$	4 $\frac{3}{4}$	5 $\frac{1}{2}$	6	
Size point	in.	$\frac{3}{16}$	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{7}{16}$	
No. 474	per doz.	\$1.20	1.44	1.56	1.68	
No. 476	per doz.	1.20	1.44	1.56	1.68	

DRIFT PINS

Tool Steel

Stock Type

Hand Forged



FIG. 2650

No. 254. Natural Finish

Size	$\frac{7}{16}$	$\frac{3}{8}$	$\frac{11}{16}$	$\frac{1}{2}$	$\frac{13}{16}$	$\frac{7}{8}$
Length .....inches	5½	6	6½	7	7	7
Weight per dozen.....lbs.	2	4	6¾	7½	9¾	13
No. 254 .....per dozen	\$2.30	2.60	2.70	2.90	3.00	3.20

FLUE BEADING TOOLS

Crucible Tool Steel

Hand Forged

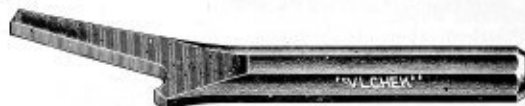


FIG. 2651

Size Octagon Steel.....inches	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$
Length .....inches	8	8½	9
Weight, per doz., about.....lbs	7	10½	15
No. 508, Natural Finish.....per dozen	\$6.00	6.60	7.20

COTTER PIN EXTRACTORS

Cast Steel

Hand Forged



FIG. 2652

Size Square Steel.....inches	$\frac{5}{16}$	$\frac{3}{8}$
Length .....inches	5½	6½
No. 832. Ebony .....per dozen	\$1.20	1.70
No. 834. Full Polished .....per dozen	1.70	2.40

MOUND SCRAPING TOOLS

FOR SCRAPING VALVES, BABBITT METAL,
JOURNALS, BEARINGS, ETC.



FIG. 2653



FIG. 2654

Set consists of six Scrapers, varying in size 8 to 14 inches.

The Scrapers are made of the best tool steel, carefully forged, tempered and hollow ground.

In oak case, with metal form for holding each tool in its place.

- No. 22—Set of six Mound Hollow Ground Scraping Tools. Oak case.....\$3.00
No. 2—Set of six, Hollow Ground..... 4.00
No. 1—Set of six, Flat..... 3.00

MOUND CURVED BEARING SCRAPERS NO. 7



FIG. 2655

Have just the right curve on blade for scraping Babbitt metal, bearings, oil grooves, etc.

Forged from the finest grade of steel, properly tempered for effective work.

Hollow ground and polished finish.

Mounted in Rosewood handles.

- No. 7—Set of 3 Mound Bearing Scrapers.....\$1.00

MOUND THREE-SQUARE SCRAPERS



FIG. 2656

Made of the best file steel and hollow ground, with hard maple handle, stained and polished.

- No. 29—Priceper dozen \$4.20



FIG. 2657

Size of Steel	No.	Kind
$\frac{1}{2}$, $\frac{3}{8}$	2	Cape Chisels
$\frac{3}{8}$, $\frac{5}{8}$, $\frac{3}{4}$	3	Cold Chisels
$\frac{5}{8}$	1	Diamond Point Chisel
$\frac{3}{8}$	1	Round-Nose Cape Chisel
$\frac{1}{2}$	1	Half Cape Chisel
$\frac{1}{2}$	1	Steel Metal Chisel

No. 20—Set of 20 Tools.....	\$4.00
No. 21—Set of 20 Tools Highly Polished.....	5.00

MOUND COLD CHISELS

These Chisels are made from a high grade crucible steel that costs twice as much as the steel usually found in blacksmith shops, thus insuring good results in forging and tempering. These Chisels are made up in sets of 5 tools: a flat chisel, a narrow cape chisel, a bent grooving chisel for cutting oil ways in engine brasses and bearings, a diamond point and calking tool, suitable for calking seams and rivets of boilers. The average length is about 8 inches. Made of $\frac{3}{4}$ - and $\frac{5}{8}$ -inch steel.

Set of 5 Cold Chisels.....	\$2.00
Highly Polished.....	2.50



FIG. 2658

MOUND PACKING TOOLS

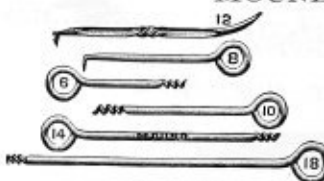


FIG. 2659

These tools are made from a special tool steel, are warranted not to break in removing packing from stuffing boxes of engines, pumps, etc., and need only to be seen to be appreciated. Can be bent to meet any requirements. Handsomely nickel-plated. The small styles in above set are made from $\frac{3}{16}$ the medium from $\frac{1}{4}$ and the large from $\frac{5}{8}$ -inch steel.

No. 1—Set of 4 Packing Tools, Nos. 6, 10, 12, 14.....	\$1.50
No. 6—Set of Packing Tools, Nos. 6, 8, 10, 12, 14, 18.....	2.25

SPECIAL LARGE PACKING TOOLS

Made of $\frac{3}{4}$ steel, heavy screw point.

20 inches long, Nickel-Plated.....	\$1.00
26 inches long, Nickel-Plated.....	1.25

MOUND IMPROVED TOOLS
NO. 20

This cut represents a new set of 20 tools gotten up for the use of Engineers, Machinists, Electricians, Millwrights. Strictly high-grade tools with all the good points of toolsmithing in their make-up.

Conveniently arranged in finished oak case and every tool highly polished and guaranteed.

SET CONSISTS OF

Size of Steel	No.	Kind
$\frac{1}{4}$	1	Scribe
$\frac{3}{8}$	1	Bent Grooving Chisel
$\frac{1}{2}$	1	Oil Groove Scraping Tool
$\frac{1}{4}$	1	Square Punch
$\frac{3}{8}$	1	Rivet Punch
$\frac{5}{8}$	2	Nail Sets
$\frac{1}{4}$	1	Prick Punch
$\frac{3}{8}$	1	Center Punch
$\frac{1}{2}$	1	Drift
$\frac{3}{8}$	1	Round Point Flat Chisel

MOUND CHISELS

FOR ENGINEERS, MACHINISTS
AND AUTOISTS

SET OF 12 NO. 12

Conveniently arranged in finished canvas roll, and every tool is highly polished and guaranteed. The set consists of:

- 1 $\frac{5}{8}$ -in. Cape Chisel
- 1 $\frac{5}{8}$ -in. Flat Chisel
- 1 $\frac{5}{8}$ -in. Diamond Point
- 1 $\frac{1}{4}$ -in. Half Cape
- 1 $\frac{1}{8}$ -in. Center Punch
- 1 $\frac{3}{8}$ -in. Solid Punch
- 1 $\frac{1}{4}$ -in. Square Punch
- 1 $\frac{1}{8}$ -in. Round Nose
- 1 $\frac{1}{8}$ -in. Flat Drift
- 1 $\frac{1}{8}$ -in. Round Flat
- 1 Bent Grooving Chisel
- 1 $\frac{5}{8}$ -in. Sheet Metal Chisel

No. 12. Set of 12 Mound Polished
Chisels, Canvas Roll....\$2.50

No. 17. Black Finish 1.75

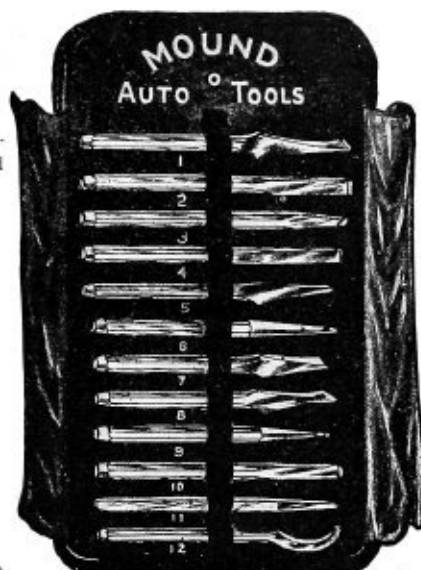


FIG. 2660

MOUND CYLINDER CARBON SCRAPERS

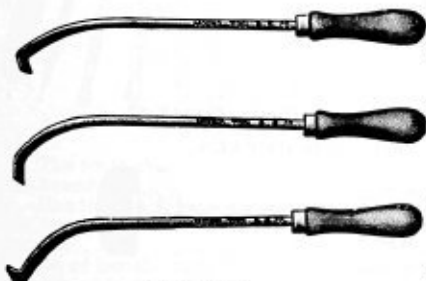


FIG. 2661

Designed for use in removing scot from the top of a piston without taking off the head of cylinder.

Made of $\frac{1}{4}$ inch crucible steel. Hand forged, nickel plated. Fastened into applewood handle.

Each set packed in a neat box.

No. 25. Set of 3 Carbon Scrapers, polished, nickel finish\$1.00

No. 55. Set of 3 Carbon Scrapers, plain nickel finish .75

"YANKEE" AUTOMATIC DRILLS**FIG. 2662**

No. 41. Has eight drill points, $\frac{1}{16}$ to $\frac{1}{64}$ inch, which are in plain sight when magazine is open. During the return movement of handle the drill point revolves backward to clear chips, etc. Entire length of tool, inclusive of drill point, $11\frac{1}{8}$ inches. One in box.

Listper dozen, \$28.20

WITH ADJUSTABLE TENSION**FIG. 2663**

No. 44. The drill has eight drill points, $\frac{1}{16}$ to $\frac{1}{64}$, in magazine in handle, arranged to show all in plain sight. Entire length of tool, inclusive of drill points, $11\frac{1}{4}$ inches. One in box.

Listper dozen, \$31.20

DRILL POINTS**FIG. 2664**

Extra Drill Points, all sizes.

List price.....per dozen \$1 08

List price.....per set of 8, .72

Drill Points furnished with drills Nos. 40, 41, 42, 43 and 44, are as here shown, $\frac{1}{16}$ to $\frac{1}{64}$.

"YANKEE" RECIPROCATING DRILL**FOR DRILLING WOOD AND METALS****FIG. 2665**

No. 50. The movement or traverse of the driver is $8\frac{1}{2}$ inches. Drill cuts continuously during both forward and backward movement of driver. The entire length of tool, without drill, is 16 inches. No drill points are furnished with this tool. Any style straight shank drill $\frac{3}{16}$ -inch diameter or less can be held in chuck. One in box.

Listper dozen, \$45.10

M. F. TOOL HOLDERS



FIG. 2666

Tools for No. 1 Holder



FIG. 2667

Tools for No. 4 Holder



FIG. 2668

Tools for No. 5 Holder



No. 2669

The tools are contained in the handles, which are hollow with screw caps. The jaws hold, with a viselike grip, tools as shown in the illustration, also a variety of other kinds of shanks. Sockets and shell threads are carefully cut so as to mesh perfectly and prevent shell from working loose and allowing tools to disengage themselves from the jaws.

The tools are made from high-grade steel and carefully tempered and finished and honed to a fine cutting edge.

Handles of beautifully finished rare tropical wood with heavily nickeled shell and jaws.

Number	1	4	5	6
Length of handle, inches	6	6 $\frac{1}{4}$	7 $\frac{1}{2}$	4 $\frac{3}{4}$
Number of tools	20	10	10	12
Length of tools, inches	1 $\frac{3}{4}$	2 $\frac{1}{2}$	4	1 $\frac{3}{4}$
Weight, per dozen (with pasteboard boxes), pounds	5	7	11	5
Price, per dozen	\$17.00	20.00	24.00	16.00

Nos. 1 and 6 packed one-half dozen in a pasteboard box.

Nos. 4 and 5 packed one in a pasteboard box.

"BESTOVALL" SCREW DRIVERS



FIG. 2670

No.	Blade, inches	3	4	5	6	7	8	10	12
50	Fluted Rosewood handle, extra quality best blued steel blade, round shank, nickel plated ferrule, extra finish. Per dozen.....	\$3.50	4.25	5.00	6.00	7.00	8.00	10.00	12.00

CHAMPION SCREW DRIVER, MACHINISTS'



FIG. 2671

Inches	2½	3	4	5	6	7	8	9	10	12
Per dozen	\$3.00	3.50	3.25	5.00	6.00	7.00	8.00	9.00	10.00	12.00

M. B. INSULETRIC SCREW DRIVER, NO. 50



Sectional View



FIG. 2672

This screw driver is made especially for electricians. The blade is of tempered ¼ inch tool steel, hammer forged, with a straight quarter inch tip which will fit the countersinks of porcelain fittings. The handle is of selected hickory, heavily fluted, with natural wood finish. It has a heavy rivet head giving protection from injury by hammer blows. The blade is secured by a steel rivet through a heavy steel ferrule. Insulation of hard fibre is used to separate the rivet head from the blade, making it shock-proof.

Blade length	inches	2	2½	3	4	6	7	8
List price	per dozen	\$3.70	4.10	4.50	5.00	6.00	7.00	8.00

PERFECT HANDLE SCREW DRIVERS

The Blade, Bolster, Handle Flat and Hammer Head are drop-forged of one piece of steel made especially for the Perfect Handle Screw Driver.



FIG. 2673

Made in two sizes.....	numbers	9½	10½
Length over all.....	inches	9½	10½
Length of blade.....	inches	4½	5
Size of square.....	inches	1½	1½
Width of point.....	inches	½	¾
Thickness of point.....	inches	⅜	⅜
List price	per dozen	\$12.00	13.00

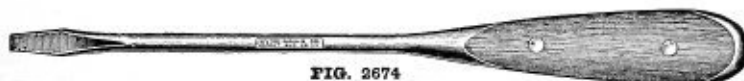


FIG. 2674

Blade length.....inches	2	2½	3	4	5	6	7	8	10	12
Diameter	¼	¼	¼	¼	¼	⅝	⅝	¾	¾	¾
List price.....per dozen	\$3.50	3.70	4.00	4.25	5.00	6.00	7.00	8.00	10.00	12.00

STARRETT'S PATENT MAGAZINE SCREW DRIVER

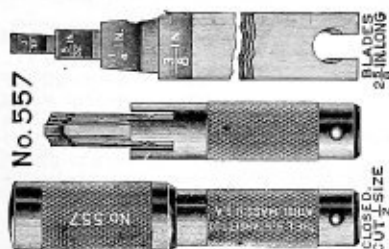


FIG. 2675

Has four blades of different widths, all carried in handle.

There should be one of these tools in every house as well as in every mechanic's pocket.

The widths of the blades are ⅜ in., ½ in., ¾ in. and 1 in.

Price, complete\$1.00
Extra blades, each......10

NO. 445. THE VICTOR SCREW DRIVER BITS



FIG. 2676

Size, inches.....	⅝	¾	1½	Assorted	Assortment		
Polished	\$2.20	2.20	2.40	2.40	⅝	¾	1½
Carbon finish	1.60	1.60	1.80	1.80	4	6	2

"YANKEE" PLAIN SCREW DRIVERS

No. 90

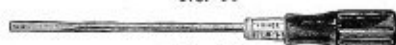


FIG. 2677

No. 95



FIG. 2678

NO. 90 STANDARD STYLE

Size, inches.....	1½	2	3	4	5	6	7	8
No. 90. List, per dozen.....	\$2.90	2.90	3.30	3.90	4.70	5.50	6.40	7.40

Size, inches.....	9	10	12	15	18	24	30
No. 90. List, per dozen.....	\$8.30	9.30	10.80	14.80	16.30	21.90	27.50

NO. 95 CABINET STYLE

Size, inches.....	2½	3½	4½	5½	6½	7½	8½	9½	10½	12½	15½
List, per doz.....	\$2.95	3.30	3.70	4.40	4.90	5.70	6.40	6.90	7.40	8.50	10.10

"YANKEE" RATCHET SCREW DRIVERS

No. 11

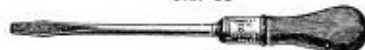


FIG. 2679

Adjustment for right or left hand is made by slide moved across direction of length of blade.

Length Blade, inches.....	2	3	4	5	6	8	10	12
List, per dozen.....	\$5.90	7.60	8.30	9.00	10.60	12.00	14.20	15.60

No. 12



FIG. 2680

No. 12. Same tool as 6 inch No. 11, except blade is only 1½ inches long; blade ⅝ inch diameter; length, 5¼ inches.

List price, per dozen.....	\$9.60
Packed half dozen in a box.	

No. 15

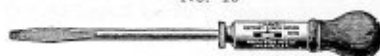


FIG. 2681

Has ⅝ inch diameter blade; has knurled washer so blade can be turned with finger and thumb. Largely used by electricians.

Length blade, inches.....	2	3	4	5	6	8
List, per dozen.....	\$6.80	7.30	7.80	8.40	8.90	9.90

No. 111



FIG. 2682

No. 115

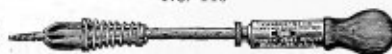


FIG. 2683

No. 111 is No. 11 with screw holder attachment.

No. 115 is No. 15 with screw holder attachment.

Size, inches.....	3	4	5	6	8
No. 111. List, per dozen.....	\$10.90	11.50	12.30	13.80	15.30
No. 115. List, per dozen.....	\$10.40	10.90	11.40	11.90	13.00

"YANKEE" MAGAZINE RATCHET SCREW DRIVER

No. 65

**FIG. 2684**

No. 65. The special features of this tool are the easy removable and interchangeable blades and the magazine in handle to hold them when not in use. As the four blades vary to suit different sizes of screws, the one driver answers in place of four at a large saving in cost and in greater convenience. The shank is of high quality steel, $\frac{1}{4}$ inch diameter, with end grooved to correspond to forks on blade, and leaving a web of metal to connect this end so it is not weakened. The blades are of tool steel.

No. 65. One-inch (length of blade, $1\frac{1}{4}$ inches). Entire length, $6\frac{3}{4}$ inches.
 List, per dozen\$16.00
 No. 65. Six-inch (length of blade, 6 inches). Entire length, $11\frac{1}{4}$ inches.
 List, per dozen\$18.20

"YANKEE" BIT HOLDER FOR BRACES**FIG. 2685**

No. 66 Holder, with four heavy interchangeable blades for use in bit brace; length, $4\frac{3}{8}$ inches. List, per dozen\$13.30

"YANKEE" SPIRAL RATCHET SCREW DRIVERS

No. 30

**FIG. 2686**

No. 35

**FIG. 2688**

No. 31

**FIG. 2687**

No. 130

**FIG. 2689**

No. 30. This is the standard size. It drives or draws screws by pushing on handle or by ratchet movement of handle and can be made rigid as an ordinary screw driver by an ingenious locking device when closed. Its advantage over all similar tools is its greater simplicity, compactness, strength, durability and easy operation. Three bits of different widths are included with each tool. The extreme length of tool with bit in chuck is $13\frac{1}{2}$ inches when closed and $19\frac{1}{4}$ inches when extended.

List price, per dozen\$29.50

No. 31. Same as No. 30, but heavier and stronger throughout, for large screws, $17\frac{1}{2}$ inches long, including bit, when closed, has $8\frac{1}{2}$ inch stroke.

List price, per dozen\$39.30

No. 35. Similar to No. 30, but lighter, for small screws and to carry in pocket. Measures 7 inches long without bit, weighs less than seven ounces.

List price, per dozen\$22.60

No. 130. Quick Return, same as No. 30, with spring in handle, causing handle to automatically come back for the next push. Can be worked with one hand and in inaccessible places.

List price, per dozen\$33.70

No. 131. Quick Return, same as No. 31, with spring in handle, causing handle to automatically come back for the next push. Can be worked with one hand and in inaccessible places.

List price, per dozen\$43.80

"YANKEE" SPIRAL RATCHET SCREW DRIVER ATTACHMENTS

"YANKEE" CHUCK WITH DRILL POINTS



FIG. 2690

For use in "Yankee" Spiral Ratchet Screw Driver.

Made in three sizes (in ordering, state plainly which size is wanted).

For No. 35 and No. 20 size 1—Chuck body is $\frac{7}{32}$ -inch diameter, with three drill points $\frac{1}{16}$ to $\frac{1}{8}$ inch inclusive; list.....per dozen, \$5.10

For No. 30 and No. 20 size 2—Chuck body is $\frac{9}{32}$ -inch diameter; list.....per dozen, \$10.20

For No. 31 and No. 20 size 3—Chuck body is $\frac{5}{16}$ -inch diameter; with eight drill points, $\frac{1}{16}$ to $\frac{11}{64}$ inch inclusive, same as used in Yankee drills; list.....per dozen, \$10.20

Packed in paper boxes of one dozen.

BITS

BICYCLE OR SLOTTED BIT



FIG. 2691

For No. 30 or No. 20 size 2.....per dozen pieces, \$5.70

Regular bit, all sizes, for Nos. 30, 31 and 35, and extra long for No. 35 only.....per dozen pieces, \$5.70

BIT WITH SCREW HOLDER FOR "YANKEE" SPIRAL DRIVERS



FIG. 2692

A longer bit than regular, with holder attached to hold screw, put in place and drive it in, especially in places difficult to reach or where only one hand can be used. When screw is driven in place the jaws open as the head of screw sinks into wood.

For No. 30 and 20 size 2.....per dozen, \$5.70

No. 31 and 20 size 3.....per dozen, 5.70

No. 35 and 20 size 1.....per dozen, 5.10

(Half dozen in box)

"YANKEE" PUSH BRACE

RIGHT AND LEFT HAND RATCHET, AND RIGID



FIG. 2693

No. 75 holds all the small tools used in a bit brace, but is operated by pushing the handle to revolve the tools, in same manner as a "Yankee" Spiral Ratchet Screw Driver. It will drill holes, drive screws in or out; can be used for tapping holes, and with socket bit drive in small lag screws, run burrs, or nuts, on bolts, etc. Not only will it do this more rapidly and conveniently than a brace, but being straight and cylindrical and operated by pushing, it can reach into many places, in corners, holes back of obstructions where a brace cannot be operated. The chuck will hold squares up to $\frac{1}{2}$ -inch wood bit. The entire length of tool is $16\frac{1}{4}$ inches when closed, and $23\frac{1}{2}$ inches when extended.

Packed one in box.

List.....per dozen, \$50.60

PEXTO BRACES GUARANTEED

8000 Series



FIG. 2694

7000 Series



FIG. 2695

8000 SERIES

Has the Samson Ball Bearing Chuck, with capacity up to full $\frac{1}{2}$ inch, for round and square taper shank drills. Grips like a vise, but releases instantly; dust proof ball bearing head; closed ring ratchet; Cocobola head and center; nickel plated.

Number	8008	8010	8012
Sweep	8 inches	10	12
Price	\$48.50	52.00	55.50

7000 SERIES

Steel Chuck, with machine cut thread. Ball bearing head; closed ring ratchet; Cocobola head and center; nickel plated.

Number	7008	7010	7012
Sweep	8 inches	10	12
Price	\$41.50	45.00	48.50

5300 Series



FIG. 2696

5000 Series



FIG. 2697

5300 SERIES

Open ring ratchet; ebonized head and center; nickel plated.

Number	5308	5310	5312
Sweep	8 inches	10	12
Price	\$23.00	24.75	26.25

5000 SERIES

Closed ring ratchet; Cocobola head and center; ball bearing head; nickel plated.

Number	5008	5010	5012
Sweep	8 inches	10	12
Price	\$36.75	40.25	43.75

RATCHET BRACES



FIG. 2698

Plain polished Ratchet Braces with ring ratchet, malleable jaws, in steel socket. Metal parts are not nickel plated. Head and handle ebonized hard wood, or, if so desired, mahogany stain finish.

Number	83	103	123
Sweep, inches	8	10	12
Price, per dozen.....	\$18.00	19.00	21.00

CORNER BRACE

No. 512. A ball bearing corner brace with 10 inch sweep, enclosed gears, hardened steel bearings, cocobolo wood parts, and chuck with alligator jaws for bit stock shanks and some sizes of round shanks. Is handsomely nickel plated. Price, per dozen.....\$60.00

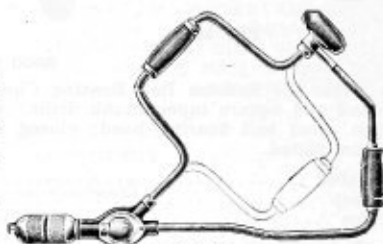


FIG. 2699

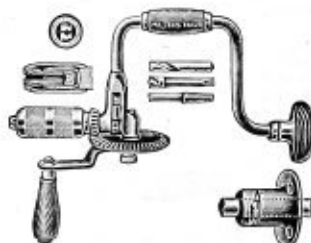


FIG. 2700

DRILL BRACE

No. 182. May be used as either brace or drill. Has 10 inch sweep, ball bearings. Master chuck for bit stock shanks, round shanks from $\frac{1}{8}$ to $\frac{1}{2}$ inch and No. 1 taper shanks. Cocobolo wood parts and highly nickel plated finish. Price, per dozen.\$60.00

SILL BORERS



FIG. 2701



FIG. 2702

No. 51. Has very short head— $2\frac{3}{4}$ inches deep. Working parts, including gears and bushings, of hardened steel. Main frame of malleable iron japanned. Length, $16\frac{1}{2}$ inches. Price, per dozen.....\$40.00

No. 52. This is the same tool as No. 51, but is complete in itself with crank and ratchet. Price, per dozen.....\$46.00

HAND DRILLS

No. 980. A two speed hand drill with capacity for round shanks from 0 to $\frac{3}{4}$ inch. Has ball bearings, hollow main handle. May be used either as hand or breast drill. Price, per dozen.....\$53.00

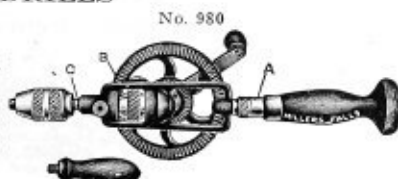


FIG. 2703

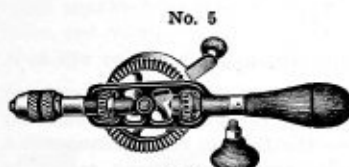


FIG. 2704

No. 5. A standard hand drill with ball bearings, double pinions, cocobolo main handle, hollow and containing 8 wood boring points. Chuck for round shanks from 0 to $\frac{1}{2}$ inch. Malleable main frame and nickle-plated parts. Price, per dozen.....\$31.50

No. 105. Similar to No. 5, but does not have idler pinion and large gear has narrow rim. Chuck has capacity from 0 to $\frac{1}{4}$ inch for round shanks. Price, per dozen..\$31.00



No. 105

FIG. 2705



FIG. 2706

No. 2. A ball bearing hand drill with large drive gear and single speed. Chuck same as on No. 980. Hollow cocobolo handle holding 8 wood drill points. Malleable frame, nickle-plated chuck and crank. Price, per dozen\$42.00

No. 306. Has simple and effective ratchet, either to right or left, ball bearings, double pinions of steel, enclosed. Star chuck, capacity 0 to $\frac{1}{4}$ inch, detachable main handle. A beautifully finished tool with nickle-plated parts. Price, per dozen.....\$45.00



No. 306

FIG. 2707.



FIG. 2708

No. 303. Has solid steel frame, hollow main handle, stained native hardwood. Chuck with capacity 0 to $\frac{1}{2}$ inch. Does not have drill points. Chuck, main stock, and crank nickel plated. Price, per dozen.\$24.00

"YANKEE" BREAST DRILLS
WITH RIGHT AND LEFT HAND RATCHET MOVEMENTS

No. 1550

**FIG. 2709**

These Drills differ from all others in what they will do and how they will do it.

With slide in first notch (at top), it is a Plain Drill, in second a Left-hand Ratchet, in third a Right-hand Ratchet, in fourth a Double Ratchet where any movement of Crank forward or backward causes the Drill to cut continuously, a time saver and convenience when working in corners where Crank cannot be turned. In fifth (at bottom) Gearing, etc., is locked to open or close Chuck.

In double speed styles the change of speed, fast or slow, is made by simple movement of lever on hub or Gear and without removing Drill from work, and with any of the movements named above.

Made with either two or three Jaw Chuck. The two Jaw Chuck holds accurately and securely both square or round Shanks, the three Jaw round Shanks only.

Adjustable Ball Bearings take all strain or thrust.

The side handle can be unscrewed and has Screw Driver to fit screws in Drill.

The Frame is malleable iron, finished in dead black Japan. The Chuck body is malleable iron, polished and nickel plated. The Jaws of steel, drop forged and hardened. The Spindle is of steel and gears are cast iron with cut teeth.

No. 1550. Single speed with three Jaw Chuck to hold round Shank only up to $\frac{1}{2}$ inch diameter inclusive. Large Gear is $5\frac{1}{4}$ inches, small Gear $1\frac{7}{8}$ inches diameter. Entire length of Drill is 18 inches. Net weight $5\frac{1}{2}$ pounds.

Price, each\$7.90

No. 1555

**FIG. 2710**

No. 1555. Double speed with three Jaw Chuck to hold round Shank only up to $\frac{1}{2}$ inch diameter inclusive. Large Gear is $5\frac{1}{4}$ inches, small Gear $1\frac{7}{8}$ inches diameter. Entire length of Drill is 18 inches. Net weight $6\frac{1}{2}$ pounds.

Price, each\$9.30

BREAST DRILLS

No. 97. Ratchets continuously to right or left whether crank is moved backward or forward, or may be used as a plain breast drill. Has large auxiliary breast plate, ball bearings, quick change of speed and Star chuck taking round shanks from 0 to $\frac{1}{2}$ inch.

Price, per dozen.....\$110.00

No. 97



FIG. 2711

No. 118



FIG. 2712

No. 118. This is a most useful all purpose breast drill completely equipped with ball bearings. Has change of speed, level attachment, extensible crank, malleable iron frame and chuck as on No. 97.

Price, per dozen.....\$61.00

No. 200. This drill ratchets either to right or left but does not have the continuous ratchet movement of No. 97. Has quick change of speed, ball bearings, malleable iron frame and chuck as on No. 97. Price, per dozen..\$81.00

No. 200



FIG. 2713

No. 12



FIG. 2714

No. 12. This drill is the same as No. 118 except that it has two jaw Master chuck with capacity for bit stock shanks, No. 1 Morse taper shanks, and round shanks from $\frac{1}{8}$ to $\frac{1}{2}$ inch in diameter. Price, per dozen.....\$53.00

No. 100. Similar to No. 200 but does not have ratchet and crank handle cannot be straightened out.

Price, per dozen.....\$69.00

No. 100



FIG. 2715

BREAST AND CHAIN DRILLS

No. 19



FIG. 2716

No. 19 Breast Drill. Has solid steel main stock, malleable iron frame, quick change of speed, ball bearings, extensible crank and alligator chuck holding bit stock shanks and some sizes of round shanks. Do not have nickel plated parts, but chuck and main stem are polished. Price, per dozen, \$40.00.

No. 2100 Breast Drill. A moderate priced two speed breast drill with Star chuck having capacity for round shanks 0 to $\frac{1}{2}$ inch in diameter. Has cut gears, pinion of steel, malleable iron main frame. Does not have ball bearings and does not have nickel plated parts. Price, per dozen, \$59.00

No. 2100



FIG. 2717

No. 25

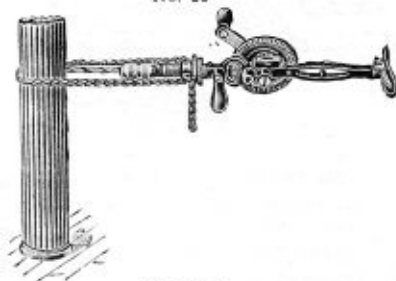


FIG. 2718

No. 25 Chain Breast Drill. The same as the No. 12 breast drill with addition of self regulating, automatic fed chain drill attachment, or may be fed by hand. Chain drill attachment is ball bearing and has chuck for bit stock shanks, round shanks from $\frac{1}{8}$ to $\frac{1}{2}$ inch in diameter and No. 1 Morse taper shanks. Price, per dozen, \$76.00

No. 719. Chain drill has self regulating automatic feed or may be fed by hand. Has ball bearings, four feet of stout chain and detachable Star chuck holding round shanks from 0 to $\frac{1}{2}$ inch in diameter. With chuck removed socket holds $\frac{1}{2}$ inch round shanks. Price, each \$4.90

No. 719



FIG. 2119

BENCH DRILLS

No. 216. Has two grades of automatic feed or may be fed by hand. Ball bearings, extensible crank, chuck holding round shanks from 0 to $\frac{1}{2}$ inch. Exceptionally rigid construction. Height over all, 28 inches. Weight, boxed, 50 pounds; net, 30 pounds. Price, each.....\$17.00

No. 216



FIG. 2720

No. 210



FIG. 2721

No. 210. A rigid, accurate drill with change of speed, extensible crank, hand feed and chuck capacity 0 to $\frac{1}{2}$ inch round shanks. Height, 24 inches. Weight, boxed, 27 $\frac{1}{2}$ pounds; net, 22 pounds. Price, each\$12.00

No. 207. Similar to No. 210 but has hand feed, single speed, chuck for round shanks from 0 to $\frac{1}{4}$ inch. Height over all, 18 inches. Weight, 8 $\frac{1}{2}$ pounds. Price, each\$5.50

No. 21

No. 21. Has hand feed, change of speed, table and vise, extensible crank, chuck with capacity from 0 to $\frac{1}{2}$ inch for round shanks. Weight, boxed, 30 pounds; net, 21 pounds. Price, each\$11.00



FIG. 2722



FIG. 2723

ANGULAR AND RATCHET DRILLING MACHINE

Has cut gears and can be geared up or geared back. Socket for $\frac{1}{2}$ inch round shanks, also chuck furnished to take round shanks from 0 to $\frac{1}{2}$ inch. Drills up to 1 inch. Height of standard, $25\frac{1}{2}$ inches. Weight, boxed, 86 pounds; net, 68 pounds.

Price, each\$34.00

STAR CHUCKS

Handsomely polished chuck with $\frac{1}{2}$ inch round shanks and three jaws holding firmly round shanks.



FIG. 2724

Number	4	5	6	7
Capacity, inch	$0-\frac{3}{16}$	$0-\frac{1}{4}$	$0-\frac{3}{8}$	$0-\frac{1}{2}$
Price, each	\$1.30	1.75	2.65	3.50

LANGDON ACME MITRE BOXES

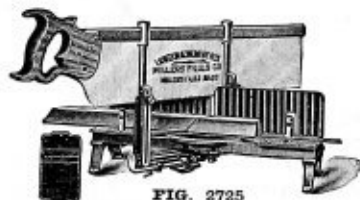


FIG. 2725

Guaranteed accurate. Saw held automatically above the work. May be locked at any angle within range of the box. Box of iron and steel castings. Saw made by Henry Disston & Son. Capacity at right angles, $10\frac{1}{4}$ inches; at mitre, 7 inches.

No.	Saw, Inches	Weight Boxed	Weight Net	Price
72	24x4	35	$23\frac{1}{2}$	\$15.50
74	28x5	37	25	17.75
75	30x5	38	$25\frac{1}{2}$	18.50

"SNELL'S" JENNINGS PATTERN AUGER BITS



FIG. 2726

Size in 16th's.....	3	4	5	6	7	8	9	10	11	12
Per dozen	\$6.00	5.00	5.00	5.00	5.00	5.00	6.00	6.00	7.00	7.00
Size in 16ths.....	13	14	15	16	17	18	20	22	24	
Per dozen	\$8.25	8.25	9.50	9.50	12.00	12.00	14.00	16.00	18.00	

ASSORTED IN CANVAS ROLL

The canvas roll is made of heavy canvas, lined with Canton flannel has a flap and pockets for holding each bit separately. The set contains 32½ quarters, one bit each 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 and 16-16ths.

List price.....per set, \$8.50

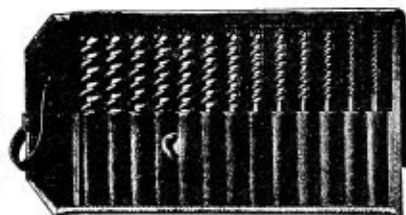


FIG. 2727

ASSORTED IN WOOD BOXES



FIG. 2728

- No. 311¼—11¼ quarters, one each, 4-5-6-8-10 and 12/16 (6 bits). List price.....per set, \$3.75
- No. 314—14 quarters, one each, 4-6-8-10-12 and 16/16 (6 bits). List price.....per set, 4.10
- No. 318¼—18¼ quarters, one each, 4-5-6-8-10-12-14 and 16/16 (8 bits). List price.....per set, 5.50
- No. 332½—32½ quarters, one each, 4-5-6-7-8-9-10-11-12-13-14-15 and 16/16 (13 bits). List price.per set, 8.50

"PUGH" AUGER OR BRACE BITS



FIG. 2729

Size .....in.	$\frac{1}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{15}{16}$
Price...per doz.	\$ 5.76	5.76	5.76	5.76	5.76	5.76	6.48	7.20	7.92	8.64
Size .....in.	$\frac{1}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	1	$1\frac{1}{16}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$
Price...per doz.	\$ 9.36	10.08	10.80	11.52	12.24	12.96	13.68	14.40	15.12	15.84
Size .....in.	$1\frac{7}{8}$	$1\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{7}{8}$	$1\frac{15}{16}$	2	
Price...per doz.	\$16.56	17.28	18.00	18.72	19.44	20.16	20.88	21.60	22.32	23.04
Size .....in.	$2\frac{1}{16}$	$2\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{3}{8}$	$2\frac{1}{2}$	$2\frac{5}{8}$	$2\frac{3}{4}$	$2\frac{7}{8}$	3	
Price...per doz.	\$24.00	25.96	28.00	30.00	34.00	38.00	42.00	47.00	52.00	

SNELL'S SOLID CENTER AUGER BITS, NO. 800



FIG. 2730

Size ....in.	$\frac{3}{16}$	4/16	$\frac{5}{16}$	6/16	$\frac{7}{16}$	8/16	$\frac{9}{16}$	10/16	$\frac{11}{16}$	12/16	$\frac{13}{16}$
List price, per doz.	\$6.00	5.00	5.00	5.00	5.00	5.00	6.00	6.00	7.00	7.00	8.25
Size ....in.	14/16	$\frac{15}{16}$	16/16	17/16	18/16	20/16	22/16	....	....	....	....
List price, per doz.	\$8.25	9.50	9.50	12.00	12.00	14.00	16.00	....	....	....	....

SNELL'S SOLID CENTER STEM AUGER BITS IN SETS
PACKED IN HARDWOOD BOX WITH BRASS TRIMMINGS

FIG. 2730A

No. 814—14 quarters, one each, 4-6-8-10-12 and 16/16
(6 bits). List price.....per set, \$4.10

No. 818 $\frac{3}{4}$ —18 $\frac{3}{4}$ quarters, one each, 4-5-6-8-10-12-14
and 16/16 (8 bits). List price.....per set, 5.50

No. 832 $\frac{1}{2}$ —32 $\frac{1}{2}$ quarters, one each, 4-5-6-7-8-9-10-11-
12-13-14-15 and 16/16 (13 bits). List price..per set, 8.50

No. 832 $\frac{1}{2}$ —Also furnished in canvas roll at same price as
above.

FORD SINGLE LIP AUGER BIT, NO. 531



FIG. 2731

Size, in.....	$\frac{1}{8}$	4/16	$\frac{5}{16}$	6/16	$\frac{7}{16}$	8/16	$\frac{9}{16}$	10/16	$\frac{11}{16}$	12/16	$\frac{13}{16}$	14/16	$\frac{15}{16}$
Price, per doz..	\$6.00	5.00	5.00	5.00	5.00	5.00	6.00	6.00	7.00	7.00	8.25	8.25	9.50

Size, in..	16/16	17/16	18/16	19/16	20/16	21/16	22/16	24/16	26/16	28/16	30/16	32/16
Price, per doz.....	\$9.50	12.00	12.00	14.00	14.00	16.00	16.00	18.00	20.00	22.00	24.00	26.00

FORD SINGLE LIP AUGER BITS, NO. 531 IN SETS

Box

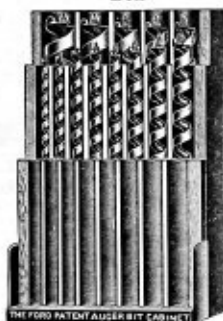


FIG. 2732

Canvas Roll
Open and Rolled

FIG. 2733



FIG. 2734

Quarters	Paper Boxes per Set	Fancy Wood Boxes and Rolls per Set
32 $\frac{1}{2}$	\$7.50	\$8.50
25 $\frac{1}{2}$	6.00	7.00
24	5.90	6.90
22 $\frac{1}{2}$	5.80	6.80
21	5.40	6.40
20 $\frac{1}{2}$	4.90	5.90
18 $\frac{3}{4}$	4.50	5.50
18	4.50	5.50
17 $\frac{1}{2}$	4.00	4.75
15 $\frac{3}{4}$	3.75	4.50
14	3.35	4.10
11 $\frac{3}{4}$	3.00	3.75

Assortment by sixteenths of an inch

4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 15 and 16 one each.
4, 5, 6, 7, 8, 9, 10, 11, 12, 14, and 16 one each.
4, 5, 7, 9, 11, and 12 one each and 6, 8, and 10 two each.
5, 7, 9, 10, 11, and 12 one each and 4, 6, and 8 two each.
5, 6, 7, 9, 10, 11, and 12 one each and 4 and 8 two each.
4, 5, 6, 7, 8, 10, 12, 14, and 16 one each.
4, 5, 6, 8, 10, 12, 14, and 16 one each.
4, 5, 6, 7, 8, 9, 10, 11, and 12 one each.
4, 6, 8, 10, 12, 14, and 16 one each.
4, 5, 6, 8, 10, 12, and 16 one each.
4, 6, 8, 10, 12, and 16 one each.
4, 5, 6, 8, 10, and 12 one each.

SNELL'S SOLID CENTER SHIP AUGER BITS



FIG. 2735

WITH SCREW, NO. 803

WITHOUT SCREW, NO. 804

Twist 4 to 5 inches.

Total length 7 to 9 inches.

Sizes in 8ths of an inch.....	2	2½	3	3½	4	4½	5	5½	6
With screw, per dozen.....	\$ 6.00	6.00	6.00	6.00	6.00	7.50	7.50	9.00	9.00
Without screw, per dozen..	\$ 7.20	7.20	7.20	7.20	7.20	9.00	9.00	10.80	10.80
Sizes in 8ths of an inch.....	6½	7	7½	8	8½	9	9½	10	....
With screw, per dozen.....	\$10.50	10.50	12.00	12.00	13.50	13.50	15.00	15.00	....
Without screw, per dozen...	\$12.60	12.60	14.40	14.40	16.20	16.20	18.00	18.00	....

One-half dozen in a box.

SNELL'S SOLID CENTER SHIP AUGER CAR BITS



FIG. 2736

WITH SCREW, NO. 809

WITHOUT SCREW, NO. 810

Twist about 12 inches.

Total length 18 inches.

Sizes in 8ths of an inch.....	2	2½	3	3½	4	4½	5	5½	6
With screw, per dozen.....	\$11.00	11.00	11.00	11.00	11.00	11.00	11.00	12.00	12.00
Without screw, per dozen...	\$13.20	13.20	13.20	13.20	13.20	13.20	13.20	14.40	14.40
Sizes in 8ths of an inch....	6½	7	7½	8	8½	9	9½	10	....
With screw, per dozen.....	\$13.00	13.00	14.50	14.50	16.00	16.00	18.00	18.00	....
Without screw, per dozen...	\$15.60	15.60	17.40	17.40	19.20	19.20	21.60	21.60	....

FORD SHIP AUGER CAR BIT, NO. 922

12-INCH TWIST



FIG. 2737

Size, inch	4/16 to 10/16	11/16 and 12/16	13/16 and 14/16	15/16 and 16/16
Price, per dozen....	\$11.00	12.00	13.00	14.50
Size, inch	17/16 and 18/16	19/16 and 20/16	21/16 and 22/16	23/16 and 24/16
Price, per dozen....	\$16.00	18.00	20.00	23.00

FORD REGULAR CAR BIT, NO. 551

12-INCH TWIST



FIG. 2738

Size, inch	4/16	5/16	6/16	7/16	8/16	9/16	10/16	11/16	12/16
Price, per dozen....	\$11.25	11.25	11.25	11.25	11.25	12.50	13.75	15.00	16.25
Size, inch	13/16	14/16	15/16	16/16	17/16	18/16	20/16	22/16	24/16
Price, per dozen....	17.50	19.00	20.50	22.00	24.00	26.00	30.00	34.00	38.00

FORD'S SHIP AUGERS

No. 912, with Screw
No. 812, without Screw

**FIG. 2739****FIG. 2740**

Ford ship augers are famous in shipyards and wherever deep boring is done. Their preeminence in this field is the most striking kind of proof of the extreme care given to every detail of their manufacture. Their keen cutting edge, sharp side lip, and deep, clean cut screw, insure the maximum of cutting power with the minimum of driving power. Automatically sized heads insure uniform accuracy, and the Ford open twist positively prevents chip clogging.

Except for the screw, these two ship augers are identical. They vary in length according to their diameter sizes. 4/16, 5/16, and 6/16 in. have 8 in. twist and are 13 in. over all; 7/16 and 8/16 in. have 10 in. twist and are 15 in. over all; 9/16 to 16/16 in. have 12 in. twist and are 18 in. over all; while the larger augers have 15 in. twist and are 20 in. over all.

The no-screw auger will not drift off with the grain and is therefore recommended where absolutely straight boring is necessary. This auger is also more satisfactory for boring in very knotty woods.

Polished twist furnished up to and including 20/16 in. unless black hollow is specified.

Prices per dozen**Sizes by sixteenths of an inch****REGULAR LENGTH SHIP AUGERS WITH SCREW**

4 to 10 \$11.00	11 and 12 12.00	13 and 14 13.00	15 and 16 14.50	17 and 18 16.00	19 and 20 18.00
21 and 22 \$20.00	23 and 24 23.00	25 and 26 27.00	27 and 28 32.00	29 and 30 38.00	31 and 32 45.00

SHIP AUGERS WITHOUT SCREW

4 to 10 \$13.20	11 and 12 14.40	13 and 14 15.60	15 and 16 17.40	17 and 18 19.20	19 and 20 21.60
21 and 22 \$24.00	23 and 24 27.60	25 and 26 32.40	27 and 28 38.40	29 and 30 45.60	31 and 32 54.00

EXTRA LARGE SHIP AUGERS WITH SCREW

33 and 34 \$57.00	35 and 36 72.00	37 and 38 86.00	39 and 40 101.00	41 and 42 115.00	43 and 44 130.00
45 and 46 \$144.00	47 and 48 158.00	49 and 50 173.00	51 and 52 187.00	53 and 54 201.00	55 and 56 216.00

For extra large ship augers without screw, add twenty per cent to price of similar size with screw.

SNELL'S POWER MACHINE BITS

Double Twist, No. 235



FIG. 2741

One-half inch Shank Bits only carried in stock. Other Shanks can be furnished if desired.

List for all Styles of Power Machine Bits.

LENGTH OF TWIST.

List Adopted October 12th, 1906.

Diameter, Inches	4-in. Per Doz.	8-in. Per Doz.	10-in. Per Doz.	12-in. Per Doz.	14-in. Per Doz.	16-in. Per Doz.	18-in. Per Doz.	20-in. Per Doz.	22-in. Per Doz.	24-in. Per Doz.
4-16	\$10.80	\$12.96	\$15.12	\$17.28						
5-16	10.80	12.96	15.12	17.28						
6-16	10.80	12.96	15.12	17.28	\$19.44	\$21.60				
7-16	10.80	12.96	15.12	17.28	19.44	21.60				
8-16	10.80	12.96	15.12	17.28	19.44	21.60	\$23.76	\$25.92	\$28.08	
9-16	12.00	14.40	16.80	19.20	21.60	24.00	26.40	28.80	31.20	
10-16	13.20	15.84	18.48	21.12	23.76	26.40	29.04	31.68	34.32	\$36.96
11-16	14.40	17.28	20.16	23.04	25.92	28.80	31.68	34.56	37.44	40.32
12-16	15.60	18.72	21.84	24.96	28.08	31.20	34.32	37.44	40.56	43.68
13-16	16.80	20.16	23.52	26.88	30.24	33.60	36.96	40.32	43.68	47.04
14-16	18.00	21.60	25.20	28.80	32.40	36.00	39.60	43.20	46.80	50.40
15-16	19.20	23.04	26.88	30.72	34.56	38.40	42.24	46.08	49.92	53.76
16-16	20.40	24.48	28.56	32.64	36.72	40.80	44.88	48.96	53.04	57.12
17-16	21.60	25.92	30.24	34.56	38.88	43.20	47.52	51.84	56.16	60.48
18-16	22.80	27.36	31.92	36.48	41.04	45.60	50.16	54.72	59.28	63.84
19-16	24.00	28.80	33.60	38.40	43.20	48.00	52.80	57.60	62.40	67.20
20-16	25.20	30.24	35.28	40.32	45.36	50.40	55.44	60.48	65.52	70.56
21-16	26.40	31.68	36.96	42.24	47.52	52.80	58.08	63.36	68.64	73.92
22-16	27.60	33.12	38.64	44.16	49.68	55.20	60.72	66.24	71.76	77.28
23-16	28.80	34.56	40.32	46.08	51.84	57.60	63.36	69.12	74.88	80.64
24-16	30.00	36.00	42.00	48.00	54.00	60.00	66.00	72.00	78.00	84.00
25-16	31.50	37.80	44.10	50.40	56.70	63.00	69.30	75.80	81.90	88.20
26-16	33.00	39.60	46.20	52.80	59.40	66.00	72.60	79.20	85.80	92.40
27-16	34.50	41.40	48.30	55.20	62.10	69.00	75.90	82.80	89.70	96.60
28-16	36.00	43.20	50.40	57.60	64.80	72.00	79.20	86.40	93.60	100.80
29-16	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00	97.50	105.00
30-16	39.00	46.80	54.60	62.40	70.20	78.00	85.80	93.60	101.40	109.20
31-16	40.50	48.60	56.70	64.80	72.90	81.00	89.10	97.20	105.30	113.40
32-16	42.00	50.40	58.80	67.20	75.60	84.00	92.4	100.80	109.20	117.60
33-16	43.80	52.56	61.32	70.08	78.84	87.60	96.36	105.12	113.88	122.64
34-16	45.60	54.72	63.84	72.96	82.08	91.20	100.32	109.44	118.56	127.68
35-16	47.40	56.88	66.36	75.84	85.32	94.80	104.28	113.76	123.24	132.72
36-16	49.20	59.04	68.88	78.72	88.56	98.40	108.24	118.08	127.92	137.76
37-16	51.00	61.20	71.40	81.60	91.80	102.00	112.20	122.40	132.60	142.80
38-16	52.80	63.36	73.92	84.48	95.04	105.60	116.16	126.72	137.28	147.84
39-16	54.60	65.52	76.44	87.36	98.28	109.20	120.12	131.04	141.96	152.88
40-16	56.40	67.68	78.96	90.24	101.52	112.80	124.08	135.36	146.64	157.92
42-16	60.00	72.72	84.84	96.96	109.08	121.20	133.32	145.44	157.56	169.68
44-16	64.80	77.76	90.72	103.68	116.64	129.60	142.56	155.52	168.48	181.44
46-16	69.00	82.80	96.60	110.40	124.20	138.00	151.80	165.60	179.40	193.20
48-16	73.20	87.84	102.48	117.12	131.76	146.40	161.04	175.68	190.32	204.96
50-16	78.00	93.60	109.20	124.80	140.40	156.00	171.60	187.20	202.80	218.40
52-16	82.80	99.36	115.92	132.48	149.04	165.60	182.16	198.72	215.28	231.84
54-16	87.60	105.12	122.64	140.16	157.68	175.20	192.72	210.24	227.76	245.28
56-16	92.40	110.88	129.36	147.84	166.32	184.80	203.28	221.76	240.24	258.72

List continued on following page.

LIST FOR ALL STYLES OF POWER MACHINE BITS

CONTINUED

LENGTH OF TWIST.

Diameter, Inches.	2-in. Per Doz.	2½-in. Per Doz.	3-in. Per Doz.	3½-in. Per Doz.	4-in. Per Doz.	4½-in. Per Doz.	5-in. Per Doz.	5½-in. Per Doz.	6-in. Per Doz.	6½-in. Per Doz.
10-16	\$39.60	\$42.24								
11-16	43.20	46.08								
12-16	46.80	49.92	\$53.04	\$56.16	\$59.28	\$62.40	\$71.76	\$81.12	\$90.48	\$99.84
13-16	50.40	53.76	57.12	60.48	63.84	67.20	77.28	87.36	97.44	107.52
14-16	54.00	57.60	61.20	64.80	68.40	72.00	82.80	93.60	104.40	115.20
15-16	57.60	61.44	65.28	69.12	72.96	76.80	88.32	99.84	111.36	122.88
16-16	61.20	65.28	69.36	73.44	77.52	81.60	93.84	106.08	118.32	130.56
17-16	64.80	69.12	73.44	77.76	82.08	86.40	99.36	112.32	125.28	138.24
18-16	68.40	72.96	77.52	82.08	86.64	91.20	104.88	118.56	132.24	145.92
19-16	72.00	76.80	81.60	86.40	91.20	96.00	110.40	124.80	139.20	153.60
20-16	75.60	80.64	85.68	90.72	95.76	100.80	115.92	131.04	146.16	161.28
21-16	79.20	84.48	89.76	95.04	100.32	105.60	121.44	137.28	153.12	168.96
22-16	82.80	88.32	93.84	99.36	104.88	110.40	126.96	143.52	160.08	176.64
23-16	86.40	92.16	97.92	103.68	109.44	115.20	132.48	149.76	167.04	184.32
24-16	90.00	96.00	102.00	108.00	114.00	120.00	138.00	156.00	174.00	192.00
25-16	94.50	100.80	107.10	113.40	119.70	126.00	144.90	163.80	182.70	201.60
26-16	99.00	105.60	112.20	118.80	125.40	132.00	151.80	171.60	191.40	211.20
27-16	103.50	110.40	117.30	124.20	131.10	138.00	158.70	179.40	200.10	220.80
28-16	108.00	115.20	122.40	129.60	136.80	144.00	165.60	187.20	208.80	230.40
29-16	112.50	120.00	127.50	135.00	142.50	150.00	172.50	195.00	217.50	240.00
30-16	117.00	124.80	132.60	140.40	148.20	156.00	179.40	202.80	226.20	249.60
31-16	121.50	129.60	137.70	145.80	153.90	162.00	186.30	210.60	234.90	259.20
32-16	126.00	134.40	142.80	151.20	159.60	168.00	193.20	218.40	243.60	268.80
33-16	131.40	140.16	148.92	157.68	166.44	175.20	201.48	227.76	254.04	280.32
34-16	136.80	145.92	155.04	164.16	173.28	182.40	209.76	237.12	264.48	291.84
35-16	142.20	151.68	161.16	170.64	180.12	189.60	218.04	246.48	274.92	303.36
36-16	147.60	157.44	167.28	177.12	186.96	196.80	226.32	255.84	285.36	314.88
37-16	153.00	163.20	173.40	183.60	193.80	204.00	234.60	265.20	295.80	326.40
38-16	158.40	168.96	179.52	190.08	200.64	211.20	242.88	274.56	306.24	337.92
39-16	163.80	174.72	185.64	196.56	207.48	218.40	251.16	283.92	316.68	349.44
40-16	169.20	180.48	191.76	203.04	214.32	225.60	259.44	293.28	327.12	360.96
42-16	181.80	193.92	206.04	218.16	230.28	242.40	278.76	315.12	351.48	387.84
44-16	194.40	207.36	220.32	233.28	246.24	259.20	298.08	336.96	375.84	414.72
46-16	207.00	220.80	234.60	248.40	262.20	276.00	317.40	358.80	400.20	441.60
48-16	219.60	234.24	248.88	263.52	278.16	292.80	336.72	380.64	424.56	468.48
50-16	234.00	249.60	265.20	280.80	296.40	312.00	358.80	405.60	452.40	499.20
52-16	248.40	264.96	281.52	298.08	314.64	331.20	380.88	430.56	480.24	529.92
54-16	262.80	280.32	297.84	315.36	332.88	350.40	402.96	455.52	508.08	560.64
56-16	277.20	295.68	314.16	332.64	351.12	369.60	425.04	480.48	535.92	591.36

No extra charge for turning shanks on Machine Bits to any size required, provided they are straight and do not exceed 3½ inches in length or 1½-inch diameter. For shanks exceeding 3½ inches in length an extra charge will be made of 3 cents per inch and if tapered 10 cents per tool, net.

Morse taper shanks and special taper shanks to blue print, \$2.50 per dozen, net.

Special shanks of any desired shape made to order. We will not be held responsible for perfect fit unless we are furnished a sample shank of exact size desired.

All bits made by odd 32ds will be charged the price of the 16th larger.

No. 235 Machine Bits, 6 and 12-inch twist by 1-inch shank, in common sizes carried in stock at factory.

SNELL'S CARPENTERS' NUT AUGERS, NO. 240
SOLID CAST STEEL

**FIG. 2742**

15 to 20 inches total length.

Inch	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{5}{8}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{3}{4}$
Per dozen.....	\$10.00	10.00	11.00	13.00	15.00	17.00	19.00	21.00	24.00	28.00
Inch	2	$2\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	$3\frac{3}{4}$	4
Per dozen.....	\$32.00	37.00	42.00	52.00	72.00	92.00	122.00	152.00	182.00	212.00

SNELL'S LONG RAFTING AUGERS, NO. 246

**FIG. 2743**

About 7 inches twist, 20 to 26 inches total length according to diameter of auger.

SOLID CAST STEEL

Inch	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$
Per dozen	\$32.00	40.00	48.00	56.00	66.00	76.00
Inch	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	$3\frac{3}{4}$	4
Per dozen	\$90.00	105.00	140.00	180.00	210.00	240.00

For sizes under $1\frac{1}{4}$ inches use millwright auger list.

BORING MACHINE AUGERS, NO. 243

**FIG. 2744**

Inch	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$
Per dozen	\$10.00	10.00	10.00	10.00	11.00	13.00	15.00	17.00
Inch	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3
Per dozen	\$19.00	21.00	24.00	28.00	32.00	42.00	52.00	92.00

Sets, quarters	18	23	41
Each	\$6.00	7.50	13.50

IN SETS, ASSORTED

18 Quarters (1 each, 4, 6, 8 qrs.), per set, \$7.50. 23 Quarters (1 each, 4, 5, 6, 8 qrs.), per set, \$9.25. 41 Quarters (1 each, $\frac{1}{2}$, $\frac{3}{8}$, $\frac{1}{4}$, $\frac{3}{16}$, $\frac{1}{8}$, $\frac{1}{16}$, $\frac{1}{32}$, 2 inches) per set, \$16.50.

These Augers are designed especially for boring hardwood.

SYRACUSE STYLE A WOOD BRACE DRILLS



FIG. 2745

The numbers indicate the size in 32nds.

No.	Per Doz.	Length	No.	Per Doz.	Length	No.	Per Doz.	Length	No.	Per Doz.	Length
2	\$3.25	3¼	7	\$4.50	6¼	10½	\$6.25	7¾	18	\$11.00	9¾
3	2.25	3½	7½	4.60	6½	11	6.50	7¾	19	11.75	9¾
4	3.25	4¾	7¾	4.75	6¾	12	7.00	8¼	20	12.50	10¼
4½	3.35	5¼	8	5.00	6¾	12½	7.25	8¾	22	14.50	10¾
5	3.50	5½	8¼	5.10	6¾	13	7.50	8¾	24	16.50	10¾
5½	3.75	5¾	8½	5.25	7¼	14	8.00	8¾	26	18.50	10¾
6	4.00	5¾	9	5.50	7¼	15	8.75	8¾	28	21.00	10¾
6¼	4.10	5¾	9½	5.75	7¾	16	9.50	9¼	30	24.00	10¾
6½	4.25	6¼	10	6.00	7¾	17	10.25	9¾	32	27.00	10¾

These bits are for wood only, but are not injured by accidental contact with nails, screws or other metal, and can be kept sharp by grinding.

EXPANSIVE AUGER BITS



FIG. 2746

No. 50. Small size with two cutters, one boring from ½ to ¾ inch and the other from ¾ to 1½ inches. Price, per dozen.....\$18.00

No. 100. Large size with two cutters, one boring from ¾ to 1¼ inches and the other from 1¼ to 3 inches. Price, per dozen..... 26.00

Extra Cutters, Nos.....	01	02	03	04
Will cut, inches.....	½ to ¾	¾ to 1½	¾ to 1¼	1¼ to 3
For Bit No.....	50	50	100	100
Per dozen	\$3.00	3.75	5.25	6.00

NO. 108A. MACHINE BITS FOR WOOD

FITTING BLACKSMITHS' DRILL PRESSES



FIG. 2747

Diameter, Inches	Price Each	Length Over All, Inches	Length Twist, Inches
$\frac{1}{8}$	\$0.50	$5\frac{1}{8}$	$2\frac{1}{8}$
$\frac{3}{16}$	.55	$5\frac{3}{8}$	$2\frac{3}{8}$
$\frac{1}{4}$	.60	$5\frac{3}{4}$	$2\frac{3}{4}$
$\frac{5}{16}$	.65	6	3
$\frac{3}{8}$	.70	$6\frac{1}{8}$	$3\frac{1}{8}$
$\frac{7}{16}$	.75	$6\frac{1}{4}$	$3\frac{1}{4}$
$\frac{1}{2}$	.80	$6\frac{3}{8}$	$3\frac{3}{8}$
$\frac{9}{16}$	.85	$6\frac{1}{2}$	$3\frac{1}{2}$
$\frac{5}{8}$	.90	$6\frac{3}{4}$	$3\frac{3}{4}$
$\frac{11}{16}$	.95	7	$3\frac{7}{8}$
$\frac{3}{4}$	1.00	$7\frac{1}{4}$	$4\frac{1}{8}$
$\frac{13}{16}$	1.10	$7\frac{1}{2}$	$4\frac{1}{4}$
$\frac{7}{8}$	1.20	$7\frac{3}{4}$	$4\frac{3}{8}$
$\frac{15}{16}$	1.30	8	$4\frac{3}{4}$
1	1.40	$8\frac{1}{4}$	5
$1\frac{1}{16}$	1.50	$8\frac{1}{2}$	$5\frac{1}{4}$
$1\frac{1}{8}$	1.60	$8\frac{3}{4}$	$5\frac{1}{2}$
$1\frac{1}{4}$	1.70	9	$5\frac{3}{4}$
$1\frac{3}{8}$	1.80	$9\frac{1}{4}$	6
$1\frac{1}{2}$	1.90	$9\frac{1}{2}$	$6\frac{1}{4}$
$1\frac{5}{8}$	2.00	$9\frac{3}{4}$	$6\frac{1}{2}$
$1\frac{3}{4}$	2.20	$9\frac{3}{4}$	$6\frac{1}{2}$
$1\frac{7}{8}$	2.60	$9\frac{3}{4}$	$6\frac{1}{2}$
$1\frac{9}{8}$	3.00	$9\frac{3}{4}$	$6\frac{1}{2}$
2	3.50	$9\frac{3}{4}$	$6\frac{1}{2}$
$2\frac{1}{8}$	4.00	10	$6\frac{3}{4}$
$2\frac{1}{4}$	4.50	10	$6\frac{3}{4}$
$2\frac{3}{8}$	5.00	10	$6\frac{3}{4}$
$2\frac{1}{2}$	5.50	10	$6\frac{3}{4}$
$2\frac{5}{8}$	6.00	$10\frac{1}{4}$	7
$2\frac{3}{4}$	6.50	$10\frac{1}{4}$	7
$2\frac{7}{8}$	7.50	$10\frac{1}{4}$	7
3	8.50	$10\frac{1}{4}$	7

The above Drills have Shanks $\frac{1}{2}$ in. diameter and $2\frac{1}{2}$ inches long.

NO. 108. STRAIGHT SHANK MACHINE BITS FOR WOOD



FIG. 2748

Diameter, Inches	Price Each	Length Over All, Inches	Length Twist, Inches	Diameter, Inches	Price Each	Length Over All, Inches	Length Twist, Inches
$\frac{1}{8}$	\$0.40	3	$1\frac{7}{8}$	$\frac{3}{16}$	\$1.60	$7\frac{1}{8}$	$4\frac{1}{2}$
$\frac{3}{16}$	.45	$3\frac{1}{4}$	$2\frac{1}{16}$	$\frac{1}{4}$	1.70	$7\frac{1}{4}$	$4\frac{3}{4}$
$\frac{1}{4}$	.50	$3\frac{1}{2}$	$2\frac{1}{4}$	$\frac{5}{16}$	1.80	$7\frac{7}{8}$	$4\frac{7}{8}$
$\frac{5}{16}$	.55	$3\frac{3}{4}$	$2\frac{3}{16}$	$\frac{3}{8}$	1.90	$7\frac{5}{8}$	5
$\frac{1}{2}$	.60	4	$2\frac{5}{8}$	$\frac{7}{8}$	2.10	8	$5\frac{1}{4}$
$\frac{5}{8}$	.65	$4\frac{1}{4}$	$2\frac{1}{2}$	$\frac{1}{2}$	2.50	$8\frac{1}{2}$	$5\frac{5}{8}$
$\frac{7}{8}$	.70	$4\frac{1}{2}$	3	$\frac{1}{2}$	2.90	9	$5\frac{7}{8}$
$\frac{1}{2}$	.75	$4\frac{3}{4}$	$3\frac{1}{8}$	1	3.25	$9\frac{1}{2}$	$6\frac{1}{4}$
$\frac{3}{4}$	.80	5	$3\frac{3}{8}$	$1\frac{1}{16}$	3.75	10	6
$\frac{1}{2}$	.85	$5\frac{1}{4}$	$3\frac{1}{2}$	$1\frac{1}{8}$	4.25	10	6
$\frac{1}{2}$	.90	$5\frac{1}{2}$	$3\frac{1}{2}$	$1\frac{1}{4}$	4.75	10	6
$\frac{1}{2}$	1.00	$5\frac{3}{4}$	$3\frac{3}{4}$	$1\frac{1}{2}$	5.25	10	6
$\frac{1}{2}$	1.10	6	4	$1\frac{5}{8}$	5.75	$10\frac{1}{2}$	$6\frac{1}{2}$
$\frac{1}{2}$	1.20	$6\frac{1}{4}$	$4\frac{1}{8}$	$1\frac{3}{4}$	6.25	$10\frac{1}{2}$	$6\frac{1}{2}$
$\frac{1}{2}$	1.30	$6\frac{3}{8}$	$4\frac{3}{8}$	$1\frac{7}{8}$	7.25	$10\frac{1}{2}$	$6\frac{1}{2}$
$\frac{1}{2}$	1.40	$6\frac{3}{4}$	$4\frac{1}{2}$	$1\frac{1}{2}$	8.25	$10\frac{1}{2}$	$6\frac{1}{2}$
$\frac{1}{2}$	1.50	$6\frac{7}{8}$	$4\frac{5}{8}$				

SNELL'S COUNTERSINKS

Made from strictly tool steel.



FIG. 2749

FLAT COUNTERSINKS NO. 67

Per dozen\$2.50



FIG. 2750

ROSE COUNTERSINKS NO. 68

Per dozen\$2.75

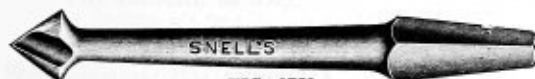


FIG. 2751

SNAIL COUNTERSINKS NO. 69

Per dozen\$2.50

**SNELL'S STANDARD GERMAN PATTERN
GIMLET BITS
NO. 71**

**FIG. 2752**

Straw Color

Sizes in 32ds of an inch	2	3	4	5	6	7	8	9	10	11	12
Per dozen	\$1.00	1.10	1.10	1.10	1.10	1.10	1.10	1.25	1.25	1.50	1.50

Assorted (4 to 8), \$1.10. One dozen in a box.

**SNELL'S ELECTRICIANS' AND BELL HANGERS'
GIMLET BITS**

NO. 75

Drawn from Bar Steel of extra quality and fitted for brace. Sizes, 6 to 12-32ds, same price.

**FIG. 2753**

Inch	12	15	18	24	30
Per dozen.....	\$5.00	6.00	7.00	9.00	12.00

**SNELL'S ELECTRICIANS' AND BELL HANGERS'
GIMLETS**

NO. 85

Wood handles. Sizes, 6 to 12-32ds, same price.

**FIG. 2754**

Inch	15	18	24	30	36
Per dozen	\$6.00	7.00	9.00	12.00	15.00

**FIG. 2755**

**SNELL'S GERMAN
PATTERN GIMLETS**

NO. 80 BRIGHT BIT

No. 80—Assorted (4 to 8-32ds)

Per gross\$12.00

M. F. AUGER HANDLES NOS. 1 AND 2



FIG. 2756

An auger handle that has been a standard for many years. Is a stout ash wood handle with two steel clamps 3 in. in length. These clamps open to admit all sizes and shapes of auger shanks except largest sizes of ship augers.

No.	1	2
Length	14	17
Price	per dozen, \$8.00	8.50

NO. 3



FIG. 2757

Is a serviceable, well-finished handle, at a low price. The body casting is made of malleable iron, the handles of ash wood and the screw of steel. Length, 16 inches.

List price.....per dozen, \$10.50

RATCHET AUGER HANDLE

NO. 4



FIG. 2758

A ratchet auger handle of the highest quality which works effectively in the closest corners. When so used the detachable steadying handle may be attached to the top at right angles to the ratchet handle. When the steadying is done in that position the end of the top handle revolves on its own axis. The ratchet can be shifted from right to left by a small lever or locked so that tool may be used as a regular auger handle without ratchet.

The chuck jaws hold most sizes of bitstock and auger shanks.

Ash wood handles. Metal parts nicked.

Length	15
Price	per dozen, \$35.00

RATCHET AUGER HANDLE

NO. 5



FIG. 2759

An auger handle with covered ratchet having feed screw attachment which makes it also usable as a ratchet drill. The ratchet works either right or left or may be locked for use as an ordinary auger handle. The steadying handle is detachable. Holds auger shanks of all ordinary sizes.

A light but strong tool made of malleable iron, steel, and second growth ash wood. Length, 16½ inches.

Price

per dozen, \$28.00

UTICA SLIP JOINT PLIER



FIG. 2760

Size	inches, 6	8
No. 4000, Utica Finish. Price.....	per dozen, \$7.30	8.80
No. 5002, Nickel Plated. Price.....	per dozen, 8.50	12.00

UTICA SHORT CHAIN NOSE PLIER

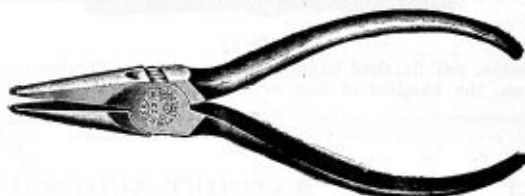


FIG. 2761

Size	inches 3x3½	4	4½	5	5½	6
No. 22. Price.....	per dozen, \$8.16	8.52	8.76	9.24	9.84	10.80

UTICA FLAT NOSE PLIER

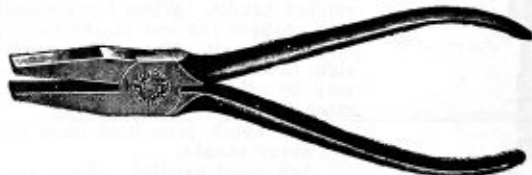


FIG. 2762

Size	inches, 3x3½	4	4½	5	5½	6
No. 20. Price.....	per dozen, \$8.16	8.52	8.76	9.24	9.84	10.80

UTICA ROUND NOSE PLIER



FIG. 2763

Size	inches, 3x3½	4	4½	5	5½	6
No. 21. Price.....	per dozen, \$8.16	8.52	8.76	9.24	9.84	10.80

UTICA COMPETITION SIDE CUTTING PLIER

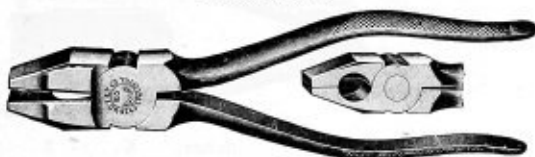
This tool same as No. 50, but not so high a finish.

**FIG. 2764**

Size	inches,	4	5	6	7	8
No. 1050. Price.....	per dozen,	\$11.40	12.00	13.00	15.50	17.00

UTICA STANDARD SIDE CUTTING PLIER

This tool has checkered handles and finished better than the No. 1050 shown above.

**FIG. 2765**

Size	inches,	4	5	6	7	8
No. 50. Price.....	per dozen,	\$12.84	13.56	14.52	17.40	19.32

UTICA BOX JOINT SIDE CUTTING PLIER**FIG. 2766**

Size	inches,	5	6	7	8
No. 2050. Price.....	per dozen,	\$20.40	22.44	27.00	31.68

UTICA DIAGONAL CUTTING PLIER**FIG. 2767**

Size	inches,	3x3½	4	4½	5	5½	6	6½
No. 42. Price.....	per dozen,	\$13.44	14.40	16.80	18.00	18.84	21.60	22.80

UTICA LINEMAN'S HEAVY SIDE CUTTING PLIER

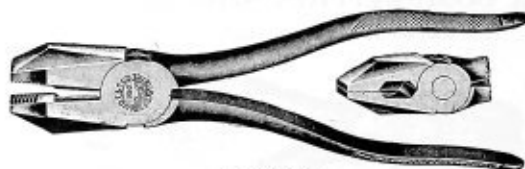


FIG. 2768

Size	inches,	6	7	8	9
No. 1950. Price.....	per dozen,	\$19.20	23.00	27.00	35.40

UTICA LINEMAN'S HEAVY SIDE CUTTING AND SPLICING PLIER



FIG. 2769

Size	inches,	6	7	8	9
No. 3050. Price.....	per dozen,	\$20.40	24.00	28.80	38.40

UTICA BOX JOINT SIDE CUTTING PLIER
WITH INSULATED HANDLES FOR HIGH VOLTAGE

FIG. 2770

Size	inches,	6	7	8
No. 4050. Price.....	per dozen,	\$38.30	43.60	48.80

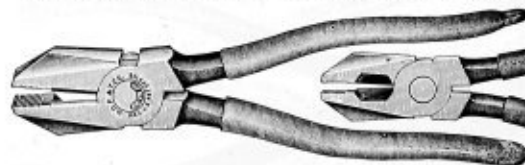
UTICA LINEMAN'S HEAVY SIDE CUTTING PLIER
WITH INSULATED HANDLES FOR VOLTAGE

FIG. 2771

Size	inches,	6	7	8
No. 3950. Price.....	per dozen,	\$36.00	43.20	48.00

UTICA GAS AND BURNER PLIER



FIG. 2772

Size	inches, 5	6	7	8	10
No. 1300. Price.....	per dozen, \$9.20	10.60	11.90	13.20	15.80

UTICA COTTER PIN PULLING PLIER



FIG. 2773

Size	inches, 5½	6½
No. 612. Price.....	per dozen, \$15.60	19.20

UTICA DUCK-BILL PLIER, WITH FLAT JAW

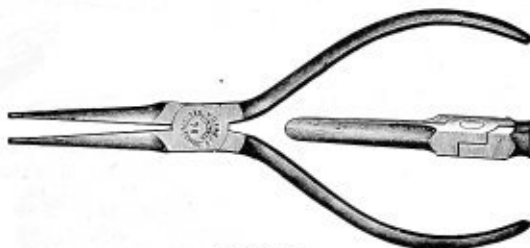


FIG. 2774

Size	inches, 4	4½	5	5½
No. 86. Price.....	per dozen, \$10.80	12.00	13.20	13.80

UTICA LAP JOINT BUTTON'S PLIER—WITH STOP JOINT



FIG. 2775

Size	inches, 4½	6	8	10
No. 3000. Price.....	per dozen, \$6.40	7.60	10.00	12.10

UTICA COMPOUND END CUTTING NIPPER

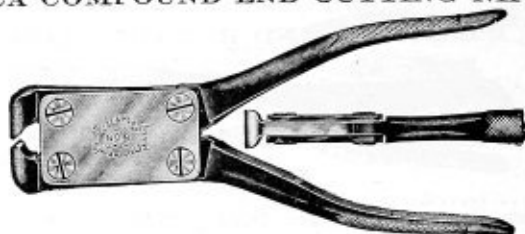


FIG. 2776

Size	inches,	4½	5½	7½	9
No. 3 Price	per dozen,	\$20.40	21.84	16.20	31.80

UTICA BULL DOG END CUTTING NIPPER



FIG. 2777

Size	inches,	5	6	7	8
No. 60. Price	per dozen,	\$12.60	14.60	17.20	19.20

CAREW'S PATENT WIRE CUTTER



FIG. 2778

With adjustable jaws. When edges become dull and need grinding, the jaws are driven out from end, showing prick marks, sharpened and replaced.

Size	inches,	8	10	12	14
Price	each,	\$2.60	2.85	3.30	4.00
Extra Jaws	per pair,	.75	.80	.85	.90

"BERNARD" CUTTING PLIERS

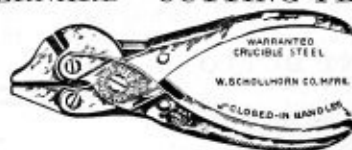


FIG. 2779

NO. 102. OPEN THROAT, PARALLEL JAWS, FULL NICKEL PLATED

Size	inches,	4½	5	5½	6	6½	7	8
Price	per doz.	\$11.50	13.00	14.50	16.00	17.50	19.00	25.00
Extra Parts:								
Front Cutting Jaws	per doz. pairs	4.00	4.50	5.00	5.50	6.00	6.50	8.50
Rear Cutting Blades	per doz. pairs	2.50	2.60	2.75	2.85	3.00	3.25	3.75
Plain Jaws (bottom)	per doz. pairs	2.00	2.25	2.50	2.75	3.00	3.25	4.00
Center Screws	per doz. pairs	.25	.25	.30	.30	.35	.35	.40
Bolts (bottom)	per doz. pairs	.45	.45	.50	.50	.55	.55	.60
Handles (bottom)	per doz. pairs	3.00	3.75	4.50	5.25	6.00	6.75	9.00

TINNERS' HAND SHEARS OR SNIPS PEXTO 1819 ORIGINAL SNIP



FIG. 2780

Forged from the best Norway iron, with special tool steel laid deep into the blades. Shaped so that you can cut the full length of blade, and will not break the metal at the end of the cut.

Absolutely the finest Snip produced by any maker. They maintain their reputation which has been handed down for nearly a century—manufactured ever since 1819.

These Snips are furnished regularly with left hand cut for right handed man—Nos. 06½ to 13 inclusive. If specified "with right hand cut for left handed man," Nos. 06½ to 10 inclusive can be furnished at no extra cost.

PRICES STRAIGHT AND CIRCULAR

Nos.	Cuts.	Length over all.	Will cut Iron No.	Wgt.	Straight Ea.	Circular Ea.
06½	4½ in.	17 in.	23	5	\$4.50	....
6½	4¼ "	15¾ "	24	3½	3.00	\$4.00
7	4 "	14¼ "	25	2¾	2.50	3.50
8	3½ "	13½ "	26	2¼	2.00	3.00
9	3 "	12 "	27	1¾	1.75	2.75
10	2½ "	11 "	28	1½	1.60	2.50
11	2¼ "	10½ "	28	1	1.20	2.00
12	2 "	10 "	28	¾	1.00	1.75
13	1¾ "	8½ "	28	½	.90	1.65

PEXTO SAMSON GUARANTEED SNIPS



FIG. 2781

Except for the 1819 Original Snip as illustrated above, there is no Snip made which is equal to the Samson. Made with laid steel blades, ground so as to take up the wear. We unhesitatingly recommend them.

PRICES STRAIGHT AND CIRCULAR

Nos.	Cuts.	Length over all.	Will cut Iron No.	Wgt.	Straight Ea.	Circular Ea.
46	4½ in.	15¾ in.	24	3½	\$3.00	\$4.00
47	4 "	14½ "	25	3	2.50	3.50
48	3½ "	14 "	26	2¾	2.00	3.00
49	3 "	12¾ "	27	1¾	1.75	2.75
50	2½ "	11 "	28	1½	1.60	2.50
51	2¼ "	10½ "	28	1¼	1.20	2.00
52	2 "	8½ "	28	¾	1.00	1.75
53	1¾ "	8 "	28	½	.90	1.65

In ordering state whether straight or circular Snips are wanted.

WISS REGULAR PATTERN TINNER SNIPS

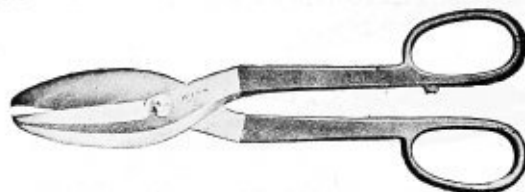


FIG. 2782

Number	12	11	10	9	8	7	6½
Full Length .....inches	8	9½	11½	12½	13¾	14½	15¾
Length of Cut.....inches	2	2¼	2½	3	3½	4	4½
Price	each \$1.45	1.75	2.40	2.55	2.95	3.70	4.40

With Left Handles—For use with the left hand, Blades as illustrated, 50 cents per pair, extra list.

WISS CIRCULAR BLADE TINNER SNIPS

Made specially for those who continually cut curved work. Tempered and ground perfectly and work as easily as a Straight Snip.



FIG. 2783

Number	12CB	11CB	10CB	9CB	8CB	7CB	6½CB
Full Length .....inches	8	9½	11½	12½	13¾	14½	15¾
Length of Cut.....inches	2	2¼	2½	3	3½	4	4½
Price	each \$2.60	2.95	3.60	4.05	4.40	5.15	6.30

With Left Handles—For use with the left hand, Blades as illustrated, 50 cents per pair, extra list.

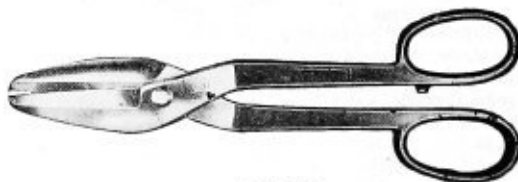
WISS COMBINATION PATTERN TINNER SNIPS
WILL CUT CURVED AS WELL AS STRAIGHT WORK

FIG. 2784

Number	100	19	18	17
Full Length .....inches	11½	12½	13½	14½
Length of Cut.....inches	2½	3	3½	4
Price	each \$2.65	3.00	3.35	4.00

With Left Handles—For use with the left hand, Blades as illustrated, 50 cents per pair, extra list.

These Snips are made with straight blades, but are ground and shaped in such a manner that they can be used as readily for cutting curves and irregular shapes as for straight work, thus combining all the advantages of both the Circular and the Straight Snip in one tool.

TINNERS' BENCH SHEARS



FIG. 2785

BENCH SHEARS, RIGHT-HAND CUT (S & C)

Bench Shears as regularly made have a right-hand cut; that is, the lower Blade is on the right side of the Shears.

Numbers	Shears	Length of Cut	Length Over All	Will Cut Iron No.	Weight lbs.	Each
00....	Bench	11½ inches	46 inches	18.....	36	\$13.50
0....	"	10½ "	42½ "	18.....	30	12.00
1....	"	9 "	39 "	18.....	24	8.00
2....	"	8¾ "	37 "	19.....	19	7.00
3....	"	7¾ "	31 "	19.....	13	6.00
4....	"	7¾ "	30 "	20.....	12	5.00
5....	"	6¼ "	27 "	21.....	9	4.00
6....	"	5¼ "	25 "	22.....	8¼	3.50
31....	Elbow Bench	4 "	26 "	18.....	9½	5.25
32....	"	6 "	39 "	16.....	26	12.00
33....	"	7½ "	46 "	14.....	48	25.00

POCKET SNIPS



FIG. 2786

Solid Forged Steel.

Polished Blades. Polished and Blued Handles.

No. 82. Cut 2 inches; entire length 7 inches.....each \$1.00

One pair in an envelope; six pairs in a box.

STARRETT HACK SAWS

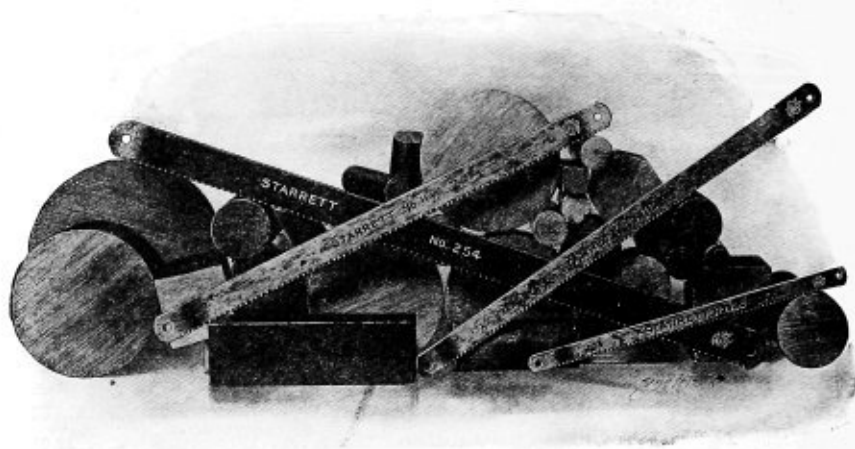


FIG. 2787

STARRETT QUALITY

These saws are made of the finest grade of steel found after exhaustive experiments to be best adapted to the purpose.

The teeth are sharp with square cutting points, set evenly and in such a manner that EVERY TOOTH CUTS. The set is just enough to insure a free, smooth, and rapid cut, removing no more stock than necessary. The saws are tempered by our improved process, which leaves them hard and tough, so that they will not "shell off," and uniform in temper. They are too hard to file. All saws are hardened throughout, except the flexible back saws. Every saw is guaranteed to be of the best quality and adapted for the work intended to be done with it as indicated in descriptions of the various styles.

In using saws care should be taken to see that the saws are placed in the machine carefully, having the saw stand plumb, with proper tension depending on the size of the saw.

When used in power machine, saws should be placed with the rake of the teeth forward, except when used in machines with draw-cut, when saws should be reversed.

When compound can be used much greater efficiency can be obtained, together with higher speed and longer life of the blade.

SUGGESTIONS AS TO SPEED

The speed of saws varies largely according to the material being cut. Saws used in machines can be run to good advantage on soft steel about 100 strokes per minute; on annealed tool steel, about 65 strokes per minute; on unannealed tool steel about 60 strokes per minute; that is, when compound or water is used; when not used, run about 50 strokes per minute.

SAWS USED IN HAND FRAMES

Strain the blade well in frame with the rake of teeth forward. Bear down on forward stroke so that blade will not slip, and ease the pressure on the return stroke. Do not bend sidewise. Use at about 50 strokes per minute.

STARRETT HACK SAWS — CONTINUED

STARRETT HACK SAW CHART

For most satisfactory results use saws referred to below.

MATERIAL TO BE CUT	NO. OF BLADE FOR HAND FRAME		NO. OF BLADE FOR POWER MACHINE			
	All Hard	Flexible or Soft Back	Light Machine	Medium Machine	Heavy Machine	Extra Heavy Machine
Light Angles Light Channels Light Tee Iron Light Ornamental	102	252	115	262		
Heavy Angles Heavy Channels Heavy Tee Iron	103 112	250	115-B	255		
Light Structural	112-B			255	254	256
Heavy Structural	112-B			255-B	254-B	256-B

MATERIAL TO BE CUT	NO. OF BLADE FOR HAND FRAME		NO. OF BLADE FOR POWER MACHINE			
	All Hard	Flexible or Soft Back	Light Machine	Medium Machine	Heavy Machine	Extra Heavy Machine
Iron Pipe Conduit Pipe Brass Pipe	102	252	115	262	259	
Solid Stock Cold Rolled Machine Steel	103-B 112-B	250 250-B	114	255-B 255-C	254-B 254-C	256-B 256-C
Tool Steel Cast Iron	103 112		114	255	254	256
Brass	103 112		115	262	259	
Sheet Metal Less than 18 gage Over 18 gage	253 102	258 252				

HACK SAW DON'TS

DON'T use a coarse blade on light sheet metal, tubing, or very hard steel.

DON'T use a coarse blade on solid brass, copper, or gas pipe.

DON'T let blades slip or slide without cutting.

DON'T run blades too fast in power machines. We suggest that for dry cutting, about 50 strokes per minute will give the best results, whereas if a compound is used, 65 to 100 strokes may be applied, according to conditions.

DON'T put too much weight on a new saw. Nothing is gained in trying to force the saw. Too much weight dulls the saw quickly.

DON'T condemn a blade because it happens to break. Possibly it was the user's fault. If you are having Hack Saw Trouble, write us, stating particulars. We have a saw for every purpose and can give you the proper saw for your work.

STARRETT HACK SAWS—CONTINUED



FIG. 2788

NO. 103. WITH REGULAR TEETH, 18 TO THE INCH, FOR GENERAL USE IN HAND FRAMES

General Purpose Blades.—For all solids, tool steels, wrought iron, cast iron and slate.

The 6, 7, 8, and 9 inch saws are $\frac{7}{16}$ inch wide, .025 inch thick; the 10, 11, and 12 inch are $\frac{1}{2}$ inch wide, .025 inch thick.

Length	6 in.	7 in.	8 in.	9 in.	10 in.	11 in.	12 in.
Per gross	\$7.00	7.50	8.00	9.00	10.00	11.00	12.00

No. 103B. The same as No. 103, except made with 14 teeth to the inch. Especially adapted for cutting cold-rolled stock and soft metals. Prices same as No. 103.

NO. 102. WITH FINE TEETH, 24 TO THE INCH, FOR USE IN HAND FRAMES ON TUBING, ETC.

For sawing tubing, brass, copper, and sheet metal, and cutting light angle irons, wrought iron pipe, electrical casing, tool steels, and brass. The 6, 7, 8, and 9 inch are $\frac{7}{16}$ inch wide, .025 inch thick. The 10, 11, and 12 inch are $\frac{1}{2}$ inch wide, .025 inch thick.

Length	6 in.	7 in.	8 in.	9 in.	10 in.	11 in.	12 in.
Per gross	\$7.00	7.50	8.00	9.00	10.00	11.00	12.00

NO. 253. WITH EXTRA FINE TEETH, 32 TO THE INCH, FOR USE IN HAND FRAMES, ON THIN METALS, ETC.

For cutting brass tubing, sheet steel, and all thin metals. The 6, 7, 8, and 9 inch are $\frac{7}{16}$ inch wide, .025 inch thick. The 10, 11, and 12 inch are $\frac{1}{2}$ inch wide, .025 inch thick.

Length	6 in.	7 in.	8 in.	9 in.	10 in.	11 in.	12 in.
Per gross	\$7.00	7.50	8.00	9.00	10.00	11.00	12.00

NO. 112. WITH REGULAR TEETH, 18 TO THE INCH, FOR GENERAL USE IN LIGHT POWER MACHINES OR HAND FRAMES

The No. 112 saws are $\frac{5}{16}$ inch wide, .030 inch thick. Experience has taught us that these blades are of the correct width and thickness for general use either in power machines or hand frames, especially where 12 inch blades are required. More weight can be used on them, they will stand more rough usage, and do far more work than thinner and narrower blades, particularly when used in power machines.

Length	8 in.	9 in.	10 in.	12 in.	13 in.	14 in.
Per gross	\$9.00	9.60	10.20	12.60	15.00	16.20

No. 112B. The same as No. 112, except made with 14 teeth to the inch. Especially adapted for cutting cold-rolled stock and soft metals. Prices same as for No. 112.

STARRETT HACK SAWS—CONTINUED

These saws are made of the finest grade of steel especially adapted to the purpose, hardened and tempered on the cutting edge only, with flexible back. Those who prefer flexible back saws will find our numbers 250, 252, and 258 highly satisfactory.

NO. 250. FLEXIBLE BACK WITH REGULAR TEETH, 18 TO THE INCH, FOR USE IN HAND FRAMES

*Especially recommended for difficult sawing where saw is liable to be strained or used by unskilled labor.

The 6, 7, 8, and 9 inch are $\frac{7}{16}$ inch wide, .025 inch thick. The 10, 11, and 12 inch are $\frac{1}{2}$ inch wide, .025 inch thick.

Length	6 in.	7 in.	8 in.	9 in.	10 in.	11 in.	12 in.
Per gross	\$7.00	7.50	8.00	9.00	10.00	11.00	12.00

No. 250B. Similar to No. 250 but made $\frac{5}{16}$ inch wide, .030 inch thick, and in 12 inch, 13 inch and 14 inch lengths only, with 14 teeth to the inch.

Length	12 in.	13 in.	14 in.
Per gross	\$12.60	13.80	15.00

NO. 252. FLEXIBLE BACK WITH FINE TEETH, 24 TO THE INCH, FOR USE IN HAND FRAMES, ON TUBING, ETC.

For sawing tubing, brass, copper, and sheet metal. The 6, 7, 8 and 9 inch are $\frac{7}{16}$ inch wide, .025 inch thick. The 10, 11, and 12 inch are $\frac{1}{2}$ inch wide, .025 inch thick.

Length	6 in.	7 in.	8 in.	9 in.	10 in.	11 in.	12 in.
Per gross	\$7.00	7.50	8.00	9.00	10.00	11.00	12.00

O. 258. FLEXIBLE BACK WITH EXTRA FINE TEETH, 32 TO THE INCH FOR USE IN HAND FRAMES, ON THIN SHEET METAL, ETC.

For sawing thin sheet metal and tubing. The 6, 7, 8 and 9 inch are $\frac{7}{16}$ inch wide, .025 inch thick. The 10, 11 and 12 inch are $\frac{1}{2}$ inch wide, .025 inch thick.

Length	6 in.	7 in.	8 in.	9 in.	10 in.	11 in.	12 in.
Per gross	\$7.00	7.50	8.00	9.00	10.00	11.00	12.00

NO. 114. WITH REGULAR TEETH, 14 TO THE INCH, FOR WORK IN MEDIUM WEIGHT POWER MACHINES



FIG. 2789

The No. 114 saws are $\frac{3}{4}$ inch wide, .032 inch thick. They are hardened throughout and are adapted especially for work in large power machines.

The lengths given for No. 114 saws refer to distance from center to center of holes, except in 14 inch and 17 inch, which are $13\frac{1}{2}$ inches and $16\frac{1}{2}$ inches, respectively, from center to center of holes.

Length	10 in.	12 in.	14 in.	16 in.	17 in.
Per gross	\$13.50	16.20	18.90	21.60	22.95

STARRETT HACK SAWS—CONTINUED

NO. 115 WITH 24 TEETH TO THE INCH, FOR WORK IN LIGHT POWER MACHINES

No. 115 saws are $\frac{3}{4}$ inch wide, .032 inch thick and are hardened throughout. The 12 inch saws measure 12 inches from center to center of holes, and the 14 inch measure $13\frac{1}{2}$ inches from center to center of holes. For cutting electrical conduit, pipe, brass stock, light angle iron and channel iron.

Length	10 in.	12 in.	14 in.
Per gross	\$13.50	16.20	18.90

No. 115B. The same as our No. 115, except that they have 18 teeth to the inch. For use in medium weight power machines to cut angle iron, I-beams, and wrought iron pipe.

Price same as No. 115.

Each size of above packed $\frac{1}{2}$ gross in a box.

NO. 262 WITH 18 TEETH TO THE INCH, FOR USE IN HIGH SPEED POWER MACHINES

These saws are $\frac{3}{4}$ inch wide, .049 inch thick, and are hardened throughout.

The 12 inch saws measure 12 inches from center to center of holes, and the 14 inch saws measure $13\frac{1}{2}$ inches from center to center of holes.

For cutting angle iron, brass and general line of ornamental iron work.

Length	12 in.	14 in.
Per gross	\$23.40	27.30

NO. 255 WITH REGULAR TEETH, 14 TO THE INCH, FOR USE IN HIGH SPEED POWER MACHINES

These saws are $\frac{3}{4}$ inch wide, .049 inch thick, are hardened throughout and especially adapted for heavy work.

The lengths given refer to distance from center to center of holes, except in the 14 inch and 17 inch lengths, which are $13\frac{1}{2}$ inches and $16\frac{1}{2}$ inches, respectively, from center to center of holes.

Length	10 in.	12 in.	14 in.	16 in.	17 in.	18 in.	19 in.	20 in.
Per gross	\$19.50	23.40	27.30	31.20	33.15	35.10	37.05	39.00

No. 255B. The same as No. 255 except that they have 12 teeth to the inch. For use in heavy high speed machines to cut cold rolled shafting and machinery steel.

Sizes and prices the same as for No. 255.

No. 255C. The same as No. 255 except that they have 10 teeth to the inch. For use in high speed machines to cut cold rolled stock and machinery steel.

Made only in 10, 12, 14, 16, and 17 inch lengths.

Prices same as for No. 255.

STARRETT HACK SAWS—CONTINUED

NO. 254 WITH COARSE TEETH, 12 TO THE INCH, FOR USE IN HIGH SPEED POWER MACHINES

The No. 254 saws are 1 inch wide, .049 inch thick. These blades are hardened throughout and are especially adapted for heavy work in large power machines.

The lengths given refer to distance from center to center of holes, except in the 14 inch and 17 inch lengths, which are $13\frac{1}{2}$ inches and $16\frac{1}{2}$ inches, respectively, from center to center of holes.

Length	12 in.	14 in.	16 in.	17 in.	18 in.	19 in.	20 in.	21 in.	22 in.	23 in.	24 in.
Per gross....	\$29.40	34.30	39.20	41.65	44.10	46.55	49.00	51.45	53.90	56.35	58.80

No. 254B. The same as No. 254, except in having 10 teeth to the inch. For general work, machinery steel, cast iron, etc.

Price same as for No. 254.

NO. 259 WITH 18 TEETH TO THE INCH, FOR HEAVY POWER MACHINES

No. 259 saws are 1 inch wide, .049 inch thick, hardened throughout. The 14 inch saws measure $13\frac{1}{2}$ inches from center to center of holes and the 17 inch saws measure $16\frac{1}{2}$ inches from center to center of holes. For cutting iron, iron pipe, structural iron, channel iron, I-beams, automobile frames, etc.

Length	14 in.	17 in.
Per gross	\$34.30	41.65

NO. 256 WITH COARSE TEETH, 12 TO THE INCH, FOR HEAVY WORK IN HIGH SPEED POWER MACHINES

These saws are 1 inch wide, .065 inch thick, and are hardened throughout.

The lengths given refer to the distance from center to center of holes, except in the 17 inch size, which measures $16\frac{1}{2}$ inches from center to center of holes.

No. 256B. The same as No. 256, except that they have 10 teeth to the inch.

For use in extra heavy power machines, in cutting structural iron and soft steel.

No. 256C. The same as No. 256, except that they have 8 teeth to the inch.

For use in extra heavy power machines, in cutting heavy structural iron, steel and cast iron.

Prices: No. 256, No. 256B and No. 256C.

Length	17 in.	18 in.	20 in.	24 in.
Per gross	\$53.55	56.70	63.00	75.60

NO. 249 SCREW SLOTTING SAW BLADES



FIG. 2790

Fourteen teeth to inch. Blades 8 inches long by $\frac{1}{2}$ inch wide.

	Approximate Thickness at Teeth	Per Dozen	Per Gross
No. 249A	.049 inch.....	\$2.10	\$25.20
No. 249B	.065 inch.....	2.40	28.80
No. 249C	.083 inch.....	2.70	32.40
No. 249D	.109 inch.....	3.00	36.00
No. 249E	Set of four blades, one of each thickness, per set....	.....	.85

STAR HACK SAW BLADES

ALL HARD



FIG. 2791

Made with 14 and 24 teeth to the inch. Blades with 14 teeth to the inch are adapted to all kinds of hack saw work and materials except thin stock and tubing with thin walls, for which blades with 24 teeth should be used. Blades with 14 teeth to the inch are supplied unless 24 teeth or "fine" is specified.

Size (Inches)		Teeth per Inch	Weight per Gross (Pounds)	Price per Gross
6 x $\frac{5}{16}$ x .025 or 23 ga.	.....	14 24	2 $\frac{3}{4}$	\$ 7.00
7 x $\frac{7}{16}$ x .025 or 23 ga.	.....	14 24	3	7.50
8 x $\frac{7}{16}$ x .025 or 23 ga.	.....	14 24	3 $\frac{1}{4}$	8.00
9 x $\frac{7}{16}$ x .025 or 23 ga.	.....	14 24	3 $\frac{1}{2}$	9.00
10 x $\frac{1}{2}$ x .025 or 23 ga.	.....	14 24	4 $\frac{1}{2}$	10.00
11 x $\frac{1}{2}$ x .025 or 23 ga.	.....	14 24	5	11.00
12 x $\frac{1}{2}$ x .025 or 23 ga.	.....	14 24	5 $\frac{1}{2}$	12.00
14 x $\frac{1}{2}$ x .030 (special ga.)	.....	14 24	8 $\frac{1}{4}$	15.00

STAR FLEXIBLE HACK SAW BLADES

Made in same sizes as All Hard listed above. Same list applies.

STAR POWER HACK SAW BLADES



FIG. 2792

Size (Inches)	Gage	Teeth per Inch	Weight per Gross (Lbs.)	Price Per Gross
12 x $\frac{5}{8}$ x .032	21	14	10	\$14.40
12 x $\frac{3}{4}$ x .032	21	14	13	16.20
12 x $\frac{3}{4}$ x .049	18	10	15 $\frac{3}{4}$	23.40
12 x 1 x .049	18	10	25	29.40
14 x $\frac{3}{4}$ x .032	21	14	14	18.90
14 x $\frac{3}{4}$ x .049	18	10	18	27.30
14 x 1 x .049	18	10	28	34.30
16 x 1 x .049	18	10	34	39.20
17 x 1 x .049	18	10	35	41.65
17 x 1 x .065	16	10	45	53.55
18 x 1 x .049	18	10	37 $\frac{1}{2}$	44.10
21 x 1 x .049	18	10	44	51.45
24 x 1 x .065	16	10	63	75.60

Note. For use in our machines Nos. 89, 90 and 91 and other similar makes. Star blades 12 x $\frac{1}{2}$ x .025 and 12 x $\frac{5}{8}$ x .032 in. are particularly recommended.

FLEXIBLE BACK BAND SAWS

HARD TEETH—ANNEALED BACK, FOR CUTTING METAL



FIG. 2753

PRICE LIST, BAND SAW STOCK IN COIL

$\frac{3}{16}$ inch wide	.025 thick	About 80 feet per pound	\$5.60 per pound
$\frac{1}{4}$ inch wide	.025 thick	About 60 feet per pound	4.20 per pound
$\frac{5}{16}$ inch wide	.025 thick	About 35 feet per pound	2.63 per pound
$\frac{1}{2}$ inch wide	.025 thick	About 25 feet per pound	2.00 per pound
$\frac{5}{8}$ inch wide	.031 thick	About 16 feet per pound	1.44 per pound
$\frac{3}{4}$ inch wide	.031 thick	About 12 feet per pound	1.20 per pound
1 inch wide	.036 thick	About 9 feet per pound	1.08 per pound

BAND SAWS CUT TO LENGTH AND BRAZED

$\frac{3}{16}$ inch wide	.025 thick	7	cents per foot, plus 20 cents for brazing
$\frac{1}{4}$ inch wide	.025 thick	7	cents per foot, plus 20 cents for brazing
$\frac{5}{16}$ inch wide	.025 thick	$7\frac{1}{2}$	cents per foot, plus 20 cents for brazing
$\frac{1}{2}$ inch wide	.025 thick	8	cents per foot, plus 20 cents for brazing
$\frac{5}{8}$ inch wide	.031 thick	9	cents per foot, plus 25 cents for brazing
$\frac{3}{4}$ inch wide	.031 thick	10	cents per foot, plus 30 cents for brazing
1 inch wide	.036 thick	12	cents per foot, plus 30 cents for brazing

Saws have either 10, 12, 14, 18, 22 or 32 teeth per inch, as ordered, and are specially tempered for the metal they are intended to cut, thereby suiting every requirement.

When ordering please state character of material to be cut, its size and shape, suitable saws will then be furnished.

Note. Brazed saws measuring 6 inches or more over the even foot will be charged for the entire foot; less than 6 inches over the even foot will not be charged for. Example: 1 Saw, $\frac{1}{2}$ inch wide x 15 feet 8 inches long = 16 feet at 8 cents (\$1.28); brazing, 20 cents; total, \$1.48.

JIG SAW COILS

$\frac{3}{16}$ x .025 x 50 feet	\$3.50 per coil
$\frac{1}{4}$ x .025 x 50 feet	3.50 per coil
$\frac{5}{16}$ x .025 x 50 feet	3.75 per coil

MAGAZINE SAW COILS

$\frac{5}{16}$ x .031 x 25 feet	\$2.25 per coil
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STARRETT HACK SAW FRAMES

NICKEL PLATED

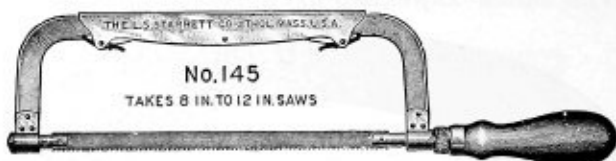


FIG. 2794

No. 145 Frame. Takes 8 to 12 inch saws. Spring plungers overlap the ends of the saw, automatically holding it to its home. By slightly pushing them back the saw may be instantly removed, thus furnishing the most convenient way of attaching or detaching the saw ever devised.

Price, each, with one blade.....\$1.25

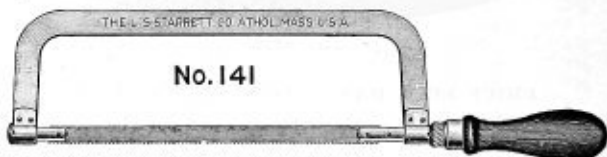


FIG. 2795

No. 141 Frame. This solid steel frame is very stiff, the stock in same being wider than commonly used, and it cannot be cramped by straining the blade. The saws may be set to cut in any one of four directions and tightened by simply turning the handle. It is well made and in every way just right.

Size, inches	8	9	10	11	12
Price, each, with one blade.....	\$0.70	.75	.80	.85	.90

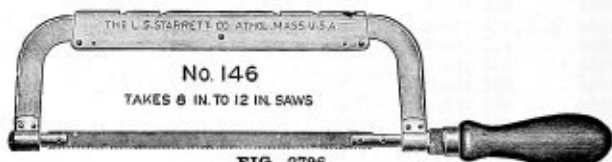


FIG. 2796

No. 146 Frame. Well made with improved adjustable back and will take in 8, 9, 10, 11 and 12 inch saws, which may be set to cut in any one of four directions, and tightened by simply turning the handle.

Price, each, with one blade.....\$1.00

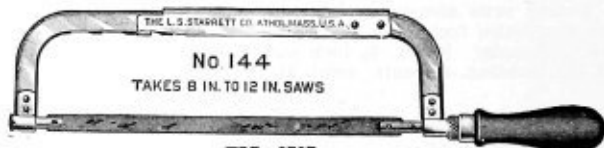


FIG. 2797

No. 144 Frame. This frame is nickel-plated, dull finish. It is well made, with improved adjustable back, and will take in 8, 9, 10, 11 and 12 inch saws, which may be set to cut in any one of four directions, and tightened by simply turning the handle.

Price, each, with one blade.....\$0.75

STARRETT HACK SAW FRAMES

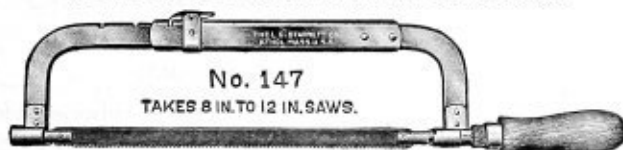


FIG. 2798

No. 147 Frame. The back in this hack saw frame is made from 16 gage tubing and is very stiff and rigid. The frame telescopes inside the tube and by means of the dog engaging in slots in the frame, adjustments can be made to accommodate saws 8, 9, 10, 11 and 12 inches in length. May be set to cut in four directions. Price, each, with one blade.....\$1.25

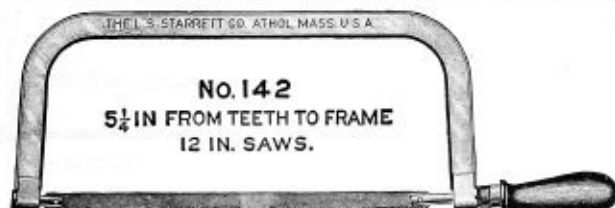


FIG. 2799

No. 142 Heavy Hack Saw Frame. For cutting girders, steel rails, etc. With hardwood handle. Takes 12 inch saws only. Depth of frame from teeth of saw to inside edge of frame, 5 1/4 inches. Nickel plated. Price, each, with one blade.....\$1.50

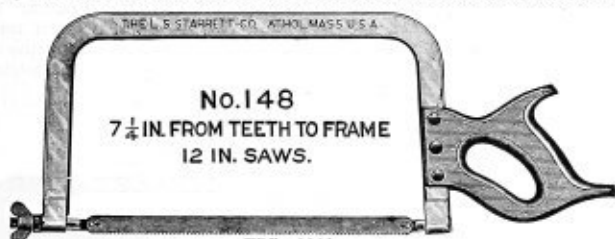


FIG. 2800

No. 148 Heavy Hack Saw Frame. For cutting girders, steel rails, etc. With hardwood handle. Takes 12 inch saws only. From teeth of saw to inside edge of frame, 7 1/4 inches. Nickel plated. Price, each, with one blade.....\$1.85

No. 149 Heavy Hack Saw Frame. For cutting girders, steel rails, etc. With hardwood handle. Takes 12 inch saws only. Nickel plated. From teeth of saw to inside edge of frame, 10 1/4 inches. Price, each, with one blade.....\$2.00

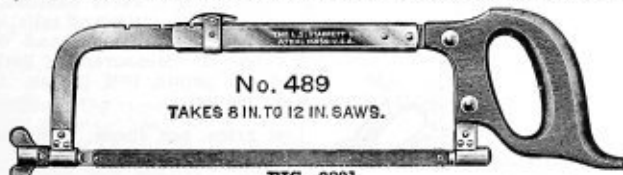


FIG. 2801

No. 489. "Easy Grip" Handle, nickel plated. Price, each.....\$1.50

HACK SAW FRAMES

ATKINS NO. 4 HACK SAW FRAME
WITH HARDWOOD HANDLE

FIG. 2802

The frame is handsomely nickeled and buffed, the handle is of applewood with varnished edges.

It will accommodate blades from 8 to 12 inches in length.

Price, each, with one blade.....\$2.00

NO. 2 STAR SAW FRAME

No. 2, Solid Frame, to hold 8 inch blades only, and face them in four directions. Polished and nickel plated. Cocobola handle.

List price, per doz., with one 8 in. blade.....\$13.00



FIG. 2803

NO. 6 STAR SAW FRAME



FIG. 2804

Frame No. 6 is stiff and strong. It is highly polished, heavily nickel plated, has a Cocobola handle, and will face blades in four directions. Adjustable to take blades from 6 to 12 inches. Our present method of

straining blades by simply turning the handle will be found a great improvement over original pattern with winged nut. Note the ring which turns down over end of the blade, and prevents the latter from falling off the pin when adjusting.

List price, per dozen, with one 12 inch blade.....\$19.00

NO. 10 STAR SAW FRAME

We offer this as the best extension frame in the market. It is light and quickly adjusted, having strength in the middle, where strength is needed. It is made of tempered steel, polished and nickel plated. The handles are Cocobola wood, highly finished.

It carries blades 8 to 12 inches long, and is marked for the different lengths.

List price, per dozen, with one 10 inch blade.....\$19.00



FIG. 2805

NO. 24 STAR SAW FRAME



FIG. 2806

Frame No. 24 is adapted for large work, such as cutting off rails, beams, etc. The back is japanned and the handle beechwood. Measurement between back and saw points, 10 $\frac{1}{4}$ inches. Carries 12-inch blades.

List price, per dozen, with one 12 inch blade.....\$22.50

STAR POWER HACK SAW MACHINE

No. 89



FIG. 2807

No. 90



FIG. 2808

NO. 89 HACK SAW

It is adapted to all kinds of shapes and sizes up to $4\frac{1}{2}$ inches in diameter. The saw stops automatically when the cut is made, and requires no attention except when inserting the work and starting machine. It has gravity feed adjusted by sliding a weight along a bar, cutting fast or slow according to the material at work on. The power is transmitted by direct drive and forty-five strokes a minute is the speed recommended. About one-third horsepower will be found most suitable.

Six 12 inch blades furnished with each machine; also block to permit the use of full length of blades. Takes 10, 11 or 12 inch blades.

Floor space, 18 x 30 inches; distance from floor to top of bed, 28 inches; size of pulley, $13\frac{1}{2}$ x $2\frac{1}{8}$ inches; weight, boxed, 222 pounds; crated, 200 pounds; net, 168 pounds.

Price, each\$40.00

NO. 90 HACK SAW

The machine has gear drive, giving great steadiness to the stroke. By a patented device the saw frame is slightly lifted on the return stroke to prolong the life of the blade, and has a quick return movement. The speed of the back stroke is just twice that of the cutting stroke, resulting in a valuable saving of time. Action automatically stops when cut is completed.

Six 12 inch blades furnished with each machine; also block to permit the use of full length of blades. Takes 12 inch blades only.

Back geared 3 to 1. Height from floor to top of bed, 28 inches; floor space, 20 x 46 inches; size of pulley, 2 x 6 inches; cutting capacity, 5 x 5 inches; weight, boxed, 294 pounds; weight, crated, 253 pounds; weight, net, 215 pounds.

Price, each\$57.00

NO. 91 HACK SAW

In all respects the same as machine No. 90, shown preceding, except that it is provided with a swivel vise. This is particularly serviceable in sawing material on an angle from 90 degrees to 45 degrees.

Weight, boxed, 305 pounds; crated, 270 pounds; net, 225 pounds.

Price, each\$59.00

"STERLING" POWER HACK SAW MACHINES

Nos. 1, 1A, 2, 2A

Nos. 2½, 3, 3A

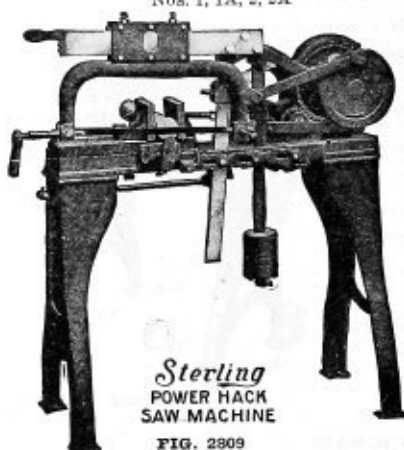


FIG. 2809

FIG. 2810

Machines Nos. 1A, 2A, 2½ and 3A are equipped with automatic lift which relieves blade on return stroke, and Machines Nos. 1, 2 and 3 are without this attachment.

Number of machine.....	1, 1A	2, 2A	2½	3, 3A	5
Length of Blades.....in.	10 to 12	12 to 14	12 to 15	17 to 21	17 to 20
Stroke of Blade.....in.	6	6	6	6	11
Cutting capacity.....in.	5 x 5	6 x 6	7 x 7	8 x 12	6 in. round
Tight and loose pulleys.....in.	10 x 1½	10 x 2½	10 x 2½	10 x 2½	14 x 2½
Geared.....	3 to 1	3 to 1	2½ to 1	2½ to 1	3 to 1
Swivel vise adjustable to any angle up to.....degrees	45	45	45	45	.....
Vise jaws, height.....in.	2½	3½	3½	4½	4½
Vise jaws, width.....in.	4½	4½	5½	5½	5½
Vise jaws, opening.....in.	6	6½	7	12	7
Floor space.....in.	17 x 32	17 x 32	17 x 38	17 x 43	18 x 44
Net weight.....lbs.	185	190	400	500	600
Weight crated.....lbs.	210	210	450	600	750
Number of blades furnished free.....	6	6	4	4	1
Size of blades furnished free.....in.	12 x ½	14 x ¾	14 x 1 x .049	17 x 1	17 x 1½
Price.....each					

These machines may be equipped with electric motors either direct or alternating current. Prices upon application.

The Nos. 2½, 3 or 3A Machines are invaluable to manufacturers of crank shafts and gasoline engines for cutting out the solid material to get length of stroke in shaft.

The Nos. 3 and 3A Machines, if desired, can be equipped to cut material up to 12x16 in., also 12 in. round. For extra equipment to cut 12x16 in. an extra charge will be made. When ordering machines to cut larger than the regular capacity, it will be necessary to specify on the order the size of work to be cut.

The automatic mechanism on these machines for lifting blade on return stroke is absolutely positive and very simple of construction, consisting only of cam and lift dog. Nothing to get out of order, should last as long as any part of machine, and give absolutely no trouble.

The peculiar construction and design of the No. 5 Machine enables it to cut the very maximum, running at only 50 to 55 strokes per minute. The fact of running at this slow speed adds very materially to the life of blade, and this is particularly important, as today a very large amount of round steel, high in carbon and manganese, is being cut. This machine can be especially equipped for 8 in. material.

Duplicate parts for all machines upon application.

Order from number on casting.

ECONOMY HIGH SPEED HACK SAW MACHINES



FIG. 2811

No. 2 Economy Power Saw is a high-class manufacturing machine with a capacity of 6x6 inches, 10, 12 and 14-inch blades. Draw cut.

No. 6 High-Speed

Cut shows Nos. 5 and 6 High-Speed Economy Saw. Is equipped with an adjustable frame, using blades from 10 to 24 inches. This is a very important feature in shops where large work is not cut continually. It reduces the cost of blades to a minimum.

It is also equipped with a quick-acting swivel vise, capacity 8x15 inches. Cuts on draw stroke, oil compression lift on return stroke; pulley, 2½x12 inches; pulley speed, 200-210 revolutions per minute.

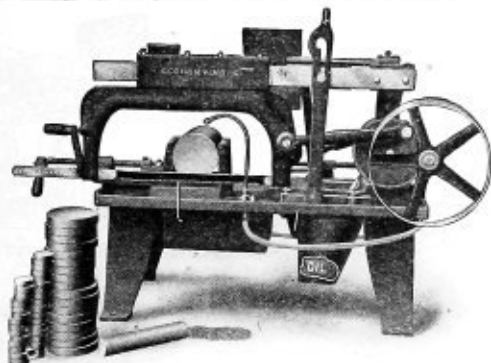


FIG. 2812

This cut shows our Economy No. 4 equipped with high-speed attachment, a tank located under the bed, having a piston pump to furnish liquid to the blade. Pulley speed of 200-210 revolutions per minute.

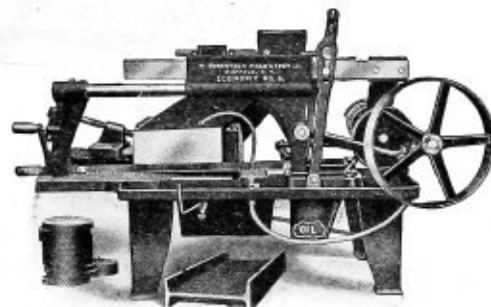


FIG. 2813

Size No.	Capacity	Type	Weight	P. Speed	Blade Length Inches
2	6x6	Belt Driven	260	50-60	10-12-14
3	6x6	Low Speed	300	100-120	10-12-14
3	6x6	High Speed	360	180-200	10-12-14
3	6x6	Two-Speed	435	150-155	10-12-14
4	8x8	Low Speed	380	140-150	12-17
4	8x8	High Speed	405	200-210	12-17
4	8x8	Two-Speed	460	150	12-17
5	8x15	Low Speed	430	140-150	12-24
5	8x15	High Speed	475	200-210	12-24
5	8x15	Two-Speed	520	150	12-24
6	8x18	Low Speed	460	140-150	12-26
6	8x18	High Speed	550	200-210	12-26
6	8x18	Two-Speed	600	150	12-26

Prices upon application.

STARRETT METAL CUTTING MACHINE NO. 950

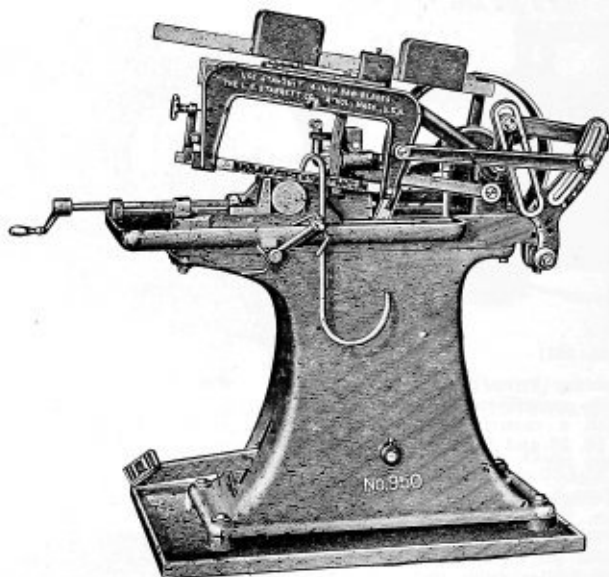


FIG. 2814

Cuts on the draw stroke.

Saw should be placed in frame with rake of teeth pointing toward driving shaft.

This machine is marked for 14 inch saws, which we recommend the use of, but is arranged to take 12 inch and 13 inch saws if necessary.

We can supply floor pan with machine when so desired at an additional price of \$10.00.

Prices given below include stock-rest, which is shipped with each machine.

Use Starrett Hack Saws at all times, they cut quicker and last longer. We make a blade for every purpose.

SPECIFICATIONS

Capacity, will cut from 0 to 6 inch stock.	Weight, 470 pounds.
Blades, 14 inch. The segment of this machine is marked for 14 inch saws, but 12 or 13 inch may also be used.	Height over all, 48 inches.
	Height to top of table, 28 inches.
	Floor space, 14 x 32 inches.
Pulley, 3 x 16 inch for 3 inch belt.	Weight, crated, (about) 525 pounds.
Price, without floor pan.....	\$215.00
Price, with floor pan.....	230.00

Sent without floor pan unless otherwise ordered.

"EUREKA" METAL BAND SAW MACHINE

This machine is designed expressly for cutting metal and is operated in the same manner as a band saw for cutting wood. The machine is strongly and substantially built, has an iron table 30 inches square, with holes drilled enabling users to convert it into a No. 2, should they, at any time, desire to acquire the attachments.

The countershaft has tight and loose pulleys 8 inches in diameter by $3\frac{1}{2}$ inch face, and should make 240 revolutions per minute. At the low speed this will operate the saw blade at approximately 190 feet per minute, or 1,076 at the high speed. The low speed is to be used when cutting manganese bronze, machine steel, etc., and the high speed for brass and other soft metals.

Weight, 1,000 pounds.

Floor space required, 48 inches by 42 inches.

Height of table, 36 inches.

Extreme height, 80 inches.

Length of Saws Used,

15 feet 8 inches.

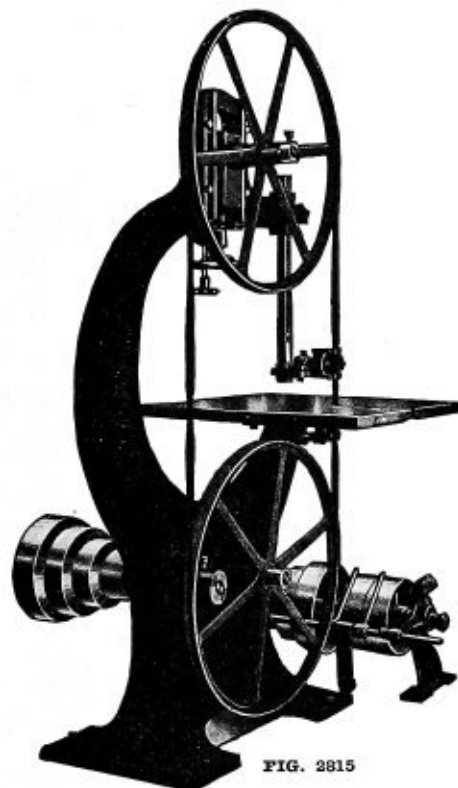


FIG. 2815

Price of Saws:

$\frac{1}{2}$ inch wide by .025 thick (brazed ready for use), each.....	\$ 1.16
$\frac{3}{8}$ inch wide by .031 thick (brazed ready for use), each.....	1.48
Price of No. 1 Machine, complete (including brazing fixture and tongs)....	176.40
Price of Attachments, including vise, automatic feed, stand, oil pot, etc.....	54.00

NO. 2 "EUREKA" METAL BAND SAW MACHINE

is the same as our No. 1, with the exception that it is furnished with stand and vise having automatic gravity feed, so that stock can be sawed without giving it personal attention, the feed being stopped when cut is finished. For cutting off stock over 30 inches long the vise is set on an angle, then, by twisting the saw slightly by use of the guide, material is cut at right angles with its length.

Every machine shop should be equipped with one of these machines. For cutting all grades of steel in sizes up to 6 inches, square or round, and in lengths up to 30 inches, we believe, all things considered, it is the best metal cutting proposition ever offered.

No. 2. Price, complete (including brazing fixture and tongs).....\$230.40

THE STARRETT BOOK
FOR
MACHINISTS' APPRENTICES

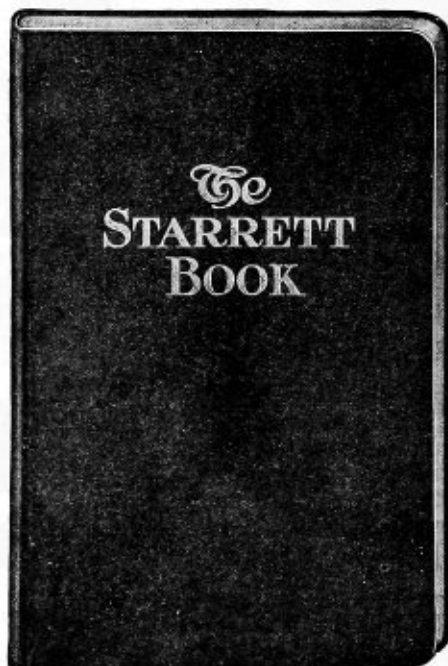


FIG. 2816

A handy little volume, 7 inches by 4 $\frac{5}{8}$ inches, of 176 pages, printed in clear type on good paper and strongly bound in serviceable imitation leather. It is profusely illustrated. It brings together in one compact little book, in easily understood language, a mass of information which could otherwise be obtained only by experience or by hunting through a large number of books and articles, and presents just what an ambitious apprentice needs to know. Even the more advanced machinist or tool-maker will find it of value. Every mechanical student and machinists' apprentice will find this book worth many times its cost.

Price, each \$0.50

STARRETT'S TOOLS

STEEL RULES—ENGLISH MEASURE

Rules are divided into parts of inches, as follows:

No. 1 Graduation	
1st corner.....	10, 20, 50, 100
2d ".....	12, 24, 48
3d ".....	16, 32, 64
4th ".....	14, 28
No. 2 Graduation	
1st corner.....	10, 20, 50, 100
2d ".....	12, 24, 48
3d ".....	16, 32, 64
4th ".....	8
No. 4 Graduation	
1st corner.....	64
2d ".....	32
3d ".....	16
4th ".....	8
No. 6 Graduation	
1st corner.....	32

2d corner.....	48
3d ".....	50
4th ".....	64
No. 7 Graduation	
1st corner.....	64
2d ".....	32
3d ".....	16
4th ".....	100
No. 10 Graduation	
1st corner.....	32
2d ".....	64
No. 11 Graduation	
1st corner.....	64
2d ".....	100
No. 12 Graduation	
1st corner.....	50
2d ".....	100

No. 13 Graduation	
1st corner.....	8
2d ".....	16
No. 14 Graduation	
1st corner.....	8
2d ".....	32
No. 15 Graduation	
1st corner.....	10
2d ".....	20
3d ".....	50
4th ".....	100
No. 16 Graduation	
1st corner.....	32
2d ".....	64
3d ".....	50
4th ".....	100

Nos. 300 to 309



FIG. 2817

Width, Lgth., Inches Inches	Price, Each	Thickness, 1/16 inch, Width, Lgth., Inches Inches	Price, Each
1/2 1	\$0.20	1 12	\$1.25
1/2 2	.30	1 1/4 18	2.00
1/2 3	.40	1 1/2 24	2.50
1/2 4	.50	1 3/4 36	5.00
1/2 6	.65	1 3/4 48	7.00
1/2 9	1.00		

The above list applies on all spring-tempered rules.

No. 600, 1 inch to 24 inch lengths, has No. 4 graduation, with 8ths and 16ths on one side and 32ds and 64ths on the other.

No. 603, 2 inch to 24 inch lengths, has No. 4 graduation, graduated in 32ds on both ends of one side.

Thickness, 1/16 inch, or No. 18 gage.	Width, Inches.....	1/2	1	1 1/4	1 1/2	1 3/4	2	2 1/2	3	3 1/2	4	6	9	12	18	24
Price.....		\$0.20	.30	.40	.50	.65	1.00	1.25	2.00	2.50						

Same width and thickness as No. 300 line.

No. 607



FIG. 2820

No. 400

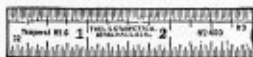


FIG. 2821

No. 400, Beveled, No. 4 graduation with 64ths on beveled edge.

No. 407, Beveled, No. 7 graduation with 100ths on beveled edge.

With One Beveled Edge and Graduated End

2 inch to 24 inch lengths.

No. 403, Beveled, No. 4 graduation, with 64ths on the beveled edge and graduated in 32ds of an inch on opposite sides of one end.

Same width and thickness as No. 300 line.

SPRING TEMPERED RULES

LIST PRICES



FIG. 2818

No. Graduation	No. Graduation
No. 4 307	No. 7
No. 1 308	No. 15
No. 2 309	No. 16

With Graduated End

2 inch to 24 inch lengths.

No. 303 has No. 4 graduations and is graduated in 32ds of an inch on opposite sides of one end.

Prices same as No. 300 line.

Nos. 600 and 603



FIG. 2819

No. 607 has No. 7 graduation, which consists of 16ths and 32ds on one side, and 64ths and 100ths on the other. Special attention is called to the fact that these rules are figured so as to assist the user to quickly read the 64ths and 100ths as shown by cut. No. 607 made only in 4 inch, 6 inch, 9 inch and 12 inch lengths. Prices same as for No. 600 and 603, above.

Same width and thickness as No. 300 line.

No. 403



FIG. 2822

STARRETT'S TOOLS

HEAVY SPRING TEMPERED RULES

No. 410

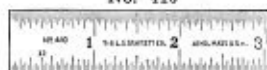


FIG. 2823

Thickness about 1/10 inch.
 Width, In. 1/4 1 1 1/4 1 1/2 1 3/4 1 7/8 2
 Length, In. 6 9 12 18 24 36 48 60 72
 Price, Ea. \$0.65 1.00 1.25 2.00 2.50 5.00 7.00 16.00 20.00
 No. 410. Heavy, spring tempered, No. 4 graduation.
 No. 417. Heavy, spring tempered, No. 7 graduation.

FLEXIBLE RULES

These are very thin spring tempered rules, nicely graduated on one side only. Those from 1 inch to 12 inches are 1/2 inch wide, and will easily conform to a 2-inch circle. Those from 18 to 48 inches are 3/4 inch wide, and are made from a trifle heavier stock.

LengthInches 1 2 3 4 6 9 12 18 24 36 48
 PriceEach \$0.20 30 40 50 65 1.00 1.25 2.00 2.50 5.00 7.00
 No. 320. No. 10 graduation. No. 322. No. 12 graduation. No. 324. No. 14 graduation.
 No. 321. No. 11 graduation. No. 323. No. 13 graduation.

No. 320



FIG. 2824

SEMI-FLEXIBLE RULES

2 inch to 12 inch lengths.

These rules are about 1/40 inch thick, heavier than the flexible rules and lighter than the spring tempered rules. They are of the same widths as the corresponding lengths of spring tempered rules.

LengthInches 2 3 4 6 9 12
 PriceEach \$0.30 .40 .50 .65 1.00 1.25
 No. 325. Semi-flexible, No. 4 graduation, and graduated in 32ds of an inch on both sides of one end.

No. 325



FIG. 2825

NARROW STEEL RULES

1/8 inch wide, No. 18 gage, spring tempered, graduated one corner each side whole length, either in 32ds and 64ths, 50ths and 100ths, or 64ths and 100ths.

LengthInches 4 6 9 12
 PriceEach \$0.50 .65 1.00 1.25
 No. 330. No. 10 graduation. No. 331. No. 11 graduation.
 No. 332. No. 12 graduation.

No. 330



FIG. 2826

STEEL SHRINK RULES

No. 370



No. 2827

These rules are made from spring tempered, except No. 372, and are of the same width and thickness as spring tempered standard rules.

No. 370. Shrink, 1/8 to foot, No. 4 graduation.
 No. 371. Shrink, 1/8 to foot, No. 2 graduation.
 No. 372. Shrink, 1/8 to foot, flexible, graduated in 32ds and 64ths.
 No. 373. Shrink and Standard, 1/8 to foot, No. 4 graduation.
 No. 375. Brass Shrink, 1/8 to foot, No. 4 graduation.

6 inchEach \$0.75
 12 "1.75
 24 "3.50

No. 376. Brass Shrink, 1/8 to foot, No. 2 graduation.
 No. 377. Double Shrink, 1/8 to foot, No. 4 graduation.
 No. 378. Double Shrink, 1/8 to foot, No. 2 graduation.
 No. 379. Shrink, 1/10 to foot, No. 2 graduation.
 No. 374. Shrink, 1/10 to foot, No. 4 graduation.
 No. 379. Shrink, 1/10 to foot, No. 2 graduation.
 No. 368. Shrink, 1/8 to foot, No. 4 graduation, 12 in. and 24 in. only.
 No. 369. Shrink, 1/8 to foot, No. 4 graduation, 12 in. and 24 in. only.
 No. 388. Shrink, 1/12 to foot, No. 4 graduation, 12 in. and 24 in. only.
 No. 389. Shrink, 1/8 to foot, No. 4 graduation, 12 in. and 24 in. only.
 No. 393. Shrink, 1/8 to foot, No. 4 graduation, 12 in. and 24 in. only.

NO. 465 BLACKSMITH'S HOOK AND HANDLE RULE

These rules are made from hard rolled sheet brass 1/10 inch thick, 1 1/2 inch wide, with heavy graduations and figures, graduated from the end in sixteenths of an inch on one side and from the inside of the hook in sixteenths of an inch on the other, adapting them for taking correct measurements from either the outside edge of a hot piece of iron, or from the inside when held against a corner. They are graduated 12 inches, have flat handles and measure 16 3/4 inches over all.

Price\$1.15



FIG 2828

STARRETT'S TOOLS

IMPROVED HOOK RULES

Length	Inches	6	9	12	18	24	36
Price	Each	\$1.00	1.40	1.75	2.50	3.00	5.75
No. 419.	Our No. 303 rule, No. 4 graduation, with hook and with end graduation.						
No. 420.	Our No. 300 rule, No. 4 graduation, with hook.						
No. 421.	Our No. 410 rule, No. 4 graduation, with hook.						

The hooks can be applied to rules of other graduations when ordered. Prices same as above.



FIG. 2829

NARROW HOOK RULES

Graduated one side in 32ds and the other in 64ths of an inch.

No. 422. No. 330 rule, with hook.

Length	Inches	4	6	3	12
Price	Each	\$0.75	.90	1.25	1.50

These hooks can be applied to our other narrow rules of different graduations.



FIG. 2830

RULES WITH THUMB SLIDES

Useful in measuring against a shoulder, the width of flanges, collars, etc. The rules are 6 inches long, about $\frac{1}{8}$ inch wide and $\frac{1}{16}$ inch thick.

No. 290.....	6 inch.....	No. 4 graduation.
No. 291.....	6 inch.....	No. 1 graduation.
No. 292.....	6 inch.....	No. 2 graduation.
No. 297.....	6 inch.....	No. 7 graduation.
Price, each.....		\$1.25



FIG. 2831

SLIDE CALIPER RULES NO. 296

These rules are 4 inches long, about $\frac{1}{8}$ inch wide and $\frac{1}{16}$ inch thick, with a jaw on the end. The graduations are No. 4, with the 32ds and 64ths on the front as shown and the 8ths and 16ths on the back. The thumb piece slides in a groove on the reverse side. The jaws are $\frac{1}{2}$ inch deep.

These tools are most convenient for measuring small rods, tubing, etc.

Price, each.....\$1.50

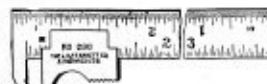


FIG. 2832

BLACKSMITHS' STEEL RULES

No. 460. Folding, spring tempered steel.

No. 462. Folding, brass, with stop joint.

All above are 2 feet long, $\frac{3}{4}$ inch wide, 12-inch joints, 2-fold.

Graduated in 8ths of an inch on one side and 16ths on the other.

No. 460.	2 feet, 2-fold, 12-inch joints.....	Each	\$0.50	Per doz.	\$6.00
No. 460.	3 feet, 3-fold, 12-inch joints.....	Each	.75	Per doz.	\$9.00
No. 462.	2 feet, 2-fold, 12-inch joints.....	Each	.75	Per doz.	9.00



FIG. 2833



FIG. 2834

Metal bound leather cases, 1-foot \$0.05; 2-foot \$0.10 each.
Nickel plated rules, extra, 1-foot, \$0.10; 2-foot, \$0.15 each.

FOLDING STEEL POCKET RULES NO. 450

$\frac{3}{4}$ inch wide, graduated the first two inches in 32ds of an inch, remainder in 16ths on one side, reverse side 8ths entire length. Raised figures.

1-foot, 4-inch joints, 3-fold.....	Each	\$0.25	Per doz.	\$2.50
2-foot, 6-inch joints, 4-fold.....	Each	.50	Per doz.	5.50

FOLDING STEEL RULES NO. 451

Made of best quality spring tempered steel, $\frac{3}{4}$ inch wide, in 6 inch sections, with double lock joints. Accurately graduated, the same as our regular machinists' rules, in 8ths of an inch on one side and 16ths on the other, with large figures for easy reading.

Length	Price	Length	Price
2-foot, 4-fold, each.....	\$1.50	4-foot, 8-fold, each.....	\$2.50
3-foot, 6-fold, each.....	2.00	6-foot, 12-fold, each.....	5.00
		8-foot, 16-fold, each.....	\$7.00



FIG. 2835

STARRETT'S TOOLS

STEEL STRAIGHT EDGES

No. 380. Plain



No. 380. Not graduated. Made in pairs when wanted. Prices are for single edges.

No. 385. One edge only is beveled, and this to $\frac{1}{8}$ inch thick from $\frac{1}{2}$ to $\frac{3}{4}$ inch back.

FIG. 2836

	No. 380 Plain	No. 385 Beveled
12 in. long, 1 in. wide, $\frac{1}{8}$ in. thick..	\$1.20	\$1.50
18 in. long, $1\frac{1}{4}$ in. wide, $\frac{1}{8}$ in. thick..	1.80	2.50
24 in. long, $1\frac{1}{2}$ in. wide, $\frac{1}{8}$ in. thick..	2.40	3.50
36 in. long, 2 in. wide, $\frac{1}{8}$ in. thick..	3.00	4.00
48 in. long, $2\frac{1}{2}$ in. wide, $\frac{1}{8}$ in. thick..	3.00	10.00
60 in. long, 3 in. wide, $\frac{1}{8}$ in. thick..	12.00	15.00
72 in. long, 3 in. wide, $\frac{1}{8}$ in. thick..	16.00	20.00

No. 385. Beveled



FIG. 2837

No. 383. Plain



GRADUATED STEEL

STRAIGHT EDGES

No. 387. Beveled

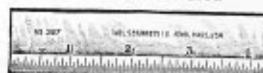


FIG. 2838

No. 383. Same widths and thicknesses as No. 380 shown above. Graduated on one side only, one edge in 16ths and the other in 8ths.

No. 387. Same widths and thicknesses as No. 385 shown above. Graduated on beveled edge only in 32ds of an inch.

Size	Inches	12	18	24	36	48
No. 383	Price	\$1.50	2.50	3.25	6.25	10.00
No. 387	Price	2.00	3.00	4.25	7.25	12.00

DRAFTSMEN'S SCALES

This scale has tilting studs, so placed that each of its four corners, with different graduations, will come in contact with the paper by its own gravity when resting on the studs, with the back edge raised at an angle of about 30 degrees. The scales are graduated on each of their four corners in parts of inches as follows:

No. 405.	10ths, 40ths, 50ths, 100ths.....	6 inch \$1.00	12 inch \$1.50
No. 405A.	8ths, 16ths, 32ds, 64ths.....	6 inch 1.00	12 inch 1.50

COMBINATION STRAIGHT EDGES NO. 167



FIG. 2841

18 inches long, $1\frac{1}{4}$ wide, not graduated.....	\$2.25	Graduated in 32ds.....	\$3.00
24 inches long, $1\frac{1}{4}$ wide, not graduated.....	2.75	Graduated in 32ds.....	3.50
30 inches long, $1\frac{1}{4}$ wide, not graduated.....	3.50	Graduated in 32ds.....	4.75
36 inches long, $1\frac{1}{2}$ wide, not graduated.....	4.25	Graduated in 32ds.....	5.50
42 inches long, $1\frac{1}{2}$ wide, not graduated.....	5.00	Graduated in 32ds.....	6.75
48 inches long, $1\frac{1}{2}$ wide, not graduated.....	5.75	Graduated in 32ds.....	8.00

Extra needle points, 30 cents per dozen; extra needle holders, 10 cents each. In ordering the latter, mention the width of straight edge blade.

KEY SEAT RULE NO. 105

No. 105. One straight edge is a spring tempered scale, with one edge beveled, graduated in 8ths, 16ths, 32ds, 64ths, the other a plain straight edge with two or three clamps (according to length), which are operated by knurled eccentrics clamping corner and edge of straight edge and scale together. This narrow auxiliary straight edge is either plain or graduated in 32ds and 64ths, and sent when ordered. Sent without the auxiliary straight edges unless otherwise ordered.

unless otherwise ordered.		6 Inch	9 Inch
No. 105A.		\$2.25	No. 105D \$3.00
No. 105B.	With auxiliary straight edge, plain.....	2.75	No. 105E 3.75
No. 105C.	With auxiliary straight edge, graduated.....	3.00	No. 105F 4.25

Where the style is not designated in an order, No. 105A will be sent.



FIG. 2842

STARRETT'S TOOLS

CENTER GAGES

For use in grinding and setting screw cutting tools.

No. 290. Not tempered, graduated one corner each	
in 32ds, 24ths, 20ths and 14ths.....	\$0.25
No. 391. Spring tempered.....	.35
No. 395. Whitworth, not tempered.....	.25
No. 396. Whitworth, spring tempered.....	.35
No. 397. Metric, not tempered.....	.25
No. 398. Metric, spring tempered.....	.35

The angles are 60°, except in No. 395 and No. 396, in which they are 55°.



FIG. 2943

NO. 392. CENTER GAGE ATTACHMENT

The above attachment is a V block with a slot above the V, containing a flat spring to frictionally hold the center gage parallel with the block. Placing the V block against a lathe spindle or face plate, a threading tool can be adjusted to line perfectly to cut both sides of a thread to the proper angle, eliminating uncertainty, for both external and internal work.

The attachment is adapted to hold the gages either by the side or by the end for testing work, and will be greatly appreciated by all users.



FIG. 2944

Price\$0.50

NO. 298. KEY SEAT CLAMP

Designed to transform any common steel scale into a Key Seat Rule. They are made from steel, case hardened and ground accurate. A pair weighs but one ounce. They can be put on or off almost instantly.

Price, per pair.....\$0.60



FIG. 2945

NO. 299. RULE CLAMP

This little tool is used to clamp two steel rules together, end to end, making one long rule. The rules may be of the same or different widths up to 1 1/4 inch. This clamp will be of special value to mechanics whose tool chests will usually not hold rules longer than 12 in.

Price\$0.50

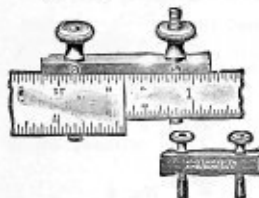


FIG. 2946

COMBINATION SQUARES

No. 11



FIG. 2947

No. 23

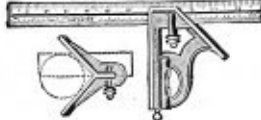


FIG. 2948

NO. 11. COMBINATION SQUARE

4 inch, with center head.....	\$1.25	Without.....	\$0.75
6 inch, with center head.....	1.50	Without.....	1.00
8 inch, with center head.....	1.75	Without.....	1.25
12 inch, with center head.....	2.00	Without.....	1.50
18 inch, with center head.....	2.75	Without.....	2.25
24 inch, with center head.....	3.25	Without.....	2.75

The 6, 9, 12, 18 and 24 inch have levels (in their stocks) and center heads, and will be sent complete unless otherwise ordered. The 4 inch square has no level. The 18 and 24 inch have same stock as 12 inch.

The blades are graduated in No. 4, No. 1, No. 2, No. 7 and No. 16 graduations. Those of No. 4 graduation being most used, will be sent unless otherwise ordered.

NO. 23. COMBINATION SQUARE

This square is similar in design to No. 11, but, while the blade is made from good, hard steel, it is not hardened. Made with No. 4 graduations only.

6 inch, with center head.....	\$1.50	Without.....	\$1.00
9 inch, with center head.....	1.75	Without.....	1.25
12 inch, with center head.....	2.00	Without.....	1.50

Sent with center head unless otherwise ordered.

STARRETT'S TOOLS

NO. 32 CENTER SQUARE

The center head on this tool is made with broader sides than those on the No. 11 center head, which feature is of value in many kinds of work. The sides are $1\frac{1}{2}$ inch wide at the ends. The center head can be furnished to fit the 12, 18 and 24 inch sizes of Nos. 11, 23 and 33 Squares, No. 9 Set, and No. 10 Inclino-meter, as well as the same tools graduated in millimeters, at an advance of 50 cents each over the price with ordinary center head.



FIG. 2849

Center head, alone	\$1.00
Center head, with 12 inch blade	2.00
Center head, with 18 inch blade	2.75
Center head, with 24 inch blade	3.25

DROP FORGED PATENT STEEL COMBINATION SQUARES NO. 33

Both heads and blades are hardened, which is graduated with heavy figures reading both ways.

6 inch, with center head	\$2.50	Without	\$2.00
9 inch, with center head	2.75	Without	2.25
12 inch, with center head	3.00	Without	2.50
18 inch, with center head	3.75	Without	3.25
24 inch, with center head	4.25	Without	3.75

The blades are graduated in Nos. 1, 2, 4, 7 and 16 graduations. Sent with center head and No. 4 graduation unless otherwise ordered.

No. 33

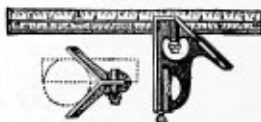


FIG. 2850

No. 17

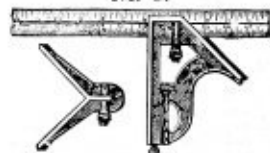


FIG. 2851

LARGE COMBINATION SQUARE NO. 17

Has Hardened Blade

Same as the No. 11, except parts are little larger. 18 in. blade, $1\frac{1}{4}$ in. wide, $\frac{3}{8}$ in. thick; 6 in. stock with 4 in. miter, with center head, \$4.25, without center head \$3.25.

24 in. blade, $1\frac{1}{4}$ in. wide, $\frac{3}{8}$ in. thick, 6 in. stock with 4 in. miter, with center head \$4.75, without center head \$3.75.

SPECIAL STANDARD SQUARE

No. 8. Has Hardened Blade

Same as No. 11, except larger and heavier. 18 in. blade, $1\frac{1}{2}$ in. wide, $1/10$ in. thick; $8\frac{1}{4}$ in. stock, with 5 in. miter, without center head \$5.00.

24 in. blade, $1\frac{1}{2}$ in. wide, $1/10$ in. thick; $8\frac{3}{4}$ in. stock, with 5 in. miter, without center head \$6.00.

Center head only, for either size

No. 8

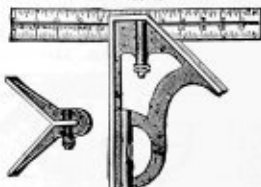


FIG. 2852

IMPROVED BEVEL PROTRACTOR NO. 12

With Hardened Blade



FIG. 2853

An adjustable rule, held firmly at any point by a thumb nut, passes through a revolving turret which is nicely graduated in degrees from 0 to 180, both right and left and can be accurately adjusted to show any angle.

The blades are the same as those used on our No. 11 squares. Those of No. 4 graduation will be sent unless otherwise ordered. The head is 7 inches long.

9 inch, complete	\$2.75
12 inch, complete	3.00
18 inch, complete	3.50
24 inch, complete	4.00
Protractor Head with Level attachment	2.00

STARRETT'S TOOLS

NEW BEVEL PROTRACTOR NO. 490

With Hardened Blade and Reversible Head

This tool is of the same general design as the No. 12 Protractor, with the additional feature of having the head extend both sides of the blade. This greatly increases the usefulness of the tool, as the same angles may be transferred from either side of the frame without resetting. Another improvement is that the turret is graduated to read both ways from 0 to 180 degrees.

The head of the Protractor is 7 inches long and is supplied with an accurate level attached to one side as shown by cut. The blades are hardened and graduated with heavy figures reading both ways. The heads are made with fine smooth finish to match the finish of our No. 33 Combination Squares. The heads will, however, also fit the blades of No. 11 and No. 23 Combination Squares and our Combination Sets. These Protractors will be sent with blades of No. 4 graduation, unless otherwise ordered.

9 inch, complete.....	\$3.50
12 inch, complete.....	3.75
18 inch, complete.....	4.50
24 inch, complete.....	5.00
Protractor Head only, with Level.....	2.50

No. 490



FIG. 2854

No. 491



FIG. 2855

NEW BEVEL PROTRACTOR NO. 491

Same as No. 490 above, except head has checked finish to match heads of Combination Square No. 11.

Prices same as No. 490.

COMBINATION SETS NO. 9

With Hardened Blade

Cut shows Combination Square (No. 11) with center head and 7 inch Bevel Protractor head (No. 12), all on the No. 11 square scale. Each head may be instantly removed, or replaced and used interchangeably with the scale.

9 inch, set complete.....	\$3.75
12 inch, set complete.....	4.00
18 inch, set complete.....	4.75
24 inch, set complete.....	5.25

No. 9



FIG. 2856

No. 433



FIG. 2857

NEW COMBINATION SETS NO. 433

With Hardened Blade

This set consists of the No. 33 Combination Square, with hardened, drop forged stock and center head, and No. 492 Protractor Head. Sent with blades of No. 4 graduation unless otherwise ordered.

9 inch, set complete.....	\$4.75
12 inch, set complete.....	5.00
18 inch, set complete.....	5.75
24 inch, set complete.....	6.25

STARRETT'S TOOLS

NEW COMBINATION SETS NO. 434

No. 434



FIG. 2858

With Hardened Blade

The set consists of the No. 33 Combination Square, with hardened, drop forged stock and center head, and the new Reversible Protractor Head, No. 490. Sent with blades of No. 4 graduation unless otherwise ordered.

9 inch, set complete.....	\$5.25
12 inch, set complete.....	5.50
18 inch, set complete.....	6.25
24 inch, set complete.....	6.75

NEW COMBINATION SETS NO. 435

This set consists of the No. 11 Combination Square, with hardened blade, and new Reversible Protractor Head No. 491. Sent with blades of No. 4 graduation unless otherwise ordered.

9 inch, set complete.....	\$4.25
12 inch, set complete.....	4.50
18 inch, set complete.....	5.25
24 inch, set complete.....	5.75

No. 435



FIG. 2859

PATENT INCLINOMETER NO. 10

With Hardened Blade



FIG. 2860

Cut represents inclinometer, try square, and bevel protractor combined. The blades are graduated one edge each in 5ths, 16ths, 32ds and 64ths.

With 12 inch blade, without center head.....	\$4.00
With 18 inch blade, without center head.....	5.00
With 24 inch blade, without center head.....	6.00
Center head, to fit all sizes.....	.75

Sent without center head unless otherwise ordered.

PATENT PROTRACTORS NO. 16

This protractor blade closes in the stock either way against a stop, making a perfect square, plumb and level. With a 24 inch blade it weighs but 1 1/4 pounds. The turret is graduated on both sides, one in degrees, the other to show pitch to the foot, so that the blade may be set by the graduation for laying off angles to any degree or any pitch, and the opposite branch of the stock will be right to lay out the complementary angle without mental calculation or error, for valley roofs, bridge work, stair gages, etc. The levels are so arranged that work can be leveled up to any degree or pitch underneath or on top of a roof, rafter, stair stringer, etc.

As a square or protractor with the sliding blade it can be used in places where a fixed blade could not and is a substitute for a whole kit of squares from the shortest to the full length of blade, making a depth gage for squaring in mortises and transferring measurements. It may be used in places of the carpenter's old-time steel square with the advantage of being packed in a chest without taking up so much room.

Without the blade the stock may be used in contracted places as a 6-inch level and plumb, while with an 18 or 24-inch blade, a level and plumb of corresponding length is obtained. Altogether this tool makes a kit that will be appreciated by every progressive mechanic.

With 12 inch blade.....	\$4.75
With 18 inch blade.....	5.50
With 24 inch blade.....	6.00
Stock only.....	3.50

The 12 inch, 18 inch and 24 inch blades of our combination squares will fit the protractor stock, but the 18 inch and 24 inch lengths are adapted for this tool.

No. 16



FIG. 2861

STARRETT'S TOOLS

NO. 13. PATENT DOUBLE SQUARE

With Hardened Blade

The blades are graduated in No. 4, No. 1, No. 2 and No. 7 and No. 16 graduations. Those of No. 4 graduation will be sent unless otherwise ordered. Both blades with 4 and 6 inch always sent unless otherwise ordered. There is a level in the stocks of the 6 inch, 9 inch and 12 inch squares.

Size	Inches	4	6	9	12
Price	Each	\$1.25	2.00	3.00	4.00
With Both Blades		1.65	2.50		

No. 13

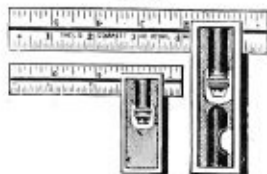


FIG. 2862

NO. 20. HARDENED EDGE SOLID STEEL SQUARES,

NOT GRADUATED

1 inch blade inside beam, full length of beam	
1 inch	\$ 2.00
1½ inch blade inside beam, full length of beam	
1½ inch	2.25
2 inch blade inside beam, full length of beam	
2 inch	2.50
3 inch blade inside beam, full length of beam	
3 inch	3.00
4½ inch blade inside beam, full length of beam	
4½ inch	4.50
6 inch blade inside beam, full length of beam	
6 inch	6.00
9 inch blade inside beam, full length of beam	
9 inch	9.00
12 inch blade inside beam, full length of beam	
12 inch	12.00
15 inch blade inside beam, full length of beam	
15 inch	20.00
18 inch blade inside beam, full length of beam	
18 inch	23.00
24 inch blade inside beam, full length of beam	
24 inch	30.00

No. 20



FIG. 2863

NO. 21. THIN STEEL TRY SQUARES

For Machinists and Draftsmen.

2x1 inch, 1/20 inch thick, graduated in 16ths and 64ths on one side, 32ds and 64ths on the other	\$1.25
3x2 inch, 1/20 inch thick, graduated in 16ths and 64ths on one side, 32ds and 64ths on the other	1.75
4x3 inch, 1/16 inch thick, graduated in 16ths and 32ds on both sides	2.25
6x4 inch, 1/16 inch thick, graduated in 16ths and 32ds on both sides	3.25
8x6 inch, 1/16 inch thick, graduated in 16ths and 32ds on both sides	4.25
10x8 inch, 1/16 inch thick, graduated in 16ths and 32ds on both sides	5.25
12x8 inch, 1/16 inch thick, graduated in 16ths and 32ds on both sides	6.25

No. 21



FIG. 2864

No. 14



FIG. 2865

NO. 14. DOUBLE STEEL SQUARES

With Hardened Blades and Head.

Cut represents a double solid steel square, with patent 2½ inch sliding scale, and is especially designed for fine tool makers. The scale is graduated on one side only, in 32ds and 64ths.

No. 14A. Square	\$2.50
No. 14B. Square, with either bevel or narrow blade	2.50
No. 14C. Square, complete	3.10

No. 14C sent complete unless otherwise ordered.

STARRETT'S TOOLS DIE MAKERS' SQUARE NO. 453

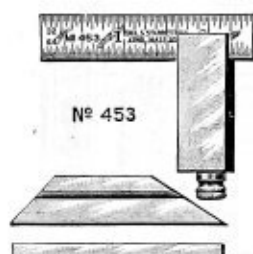


FIG. 2866

The object in view in designing this tool was to provide means whereby the blade could be adjusted at an angle with the beam. This makes an excellent gage for filing the clearance in dies, etc., as shown by sectional view.

By releasing the small screw the fulcrum pin is forced back, and the blade clamped firmly to its seat and then used as a regular square. Fitted to take the narrow and bevel blades, the same as the No. 14 Square.

No. 453A. Square	\$3.00
No. 453B. Square, with either bevel or narrow blade	2.30
No. 453C. Square, complete.....	3.60

Sent complete (No. 453C) unless otherwise ordered.

"RELIABLE" TRY SQUARES NOS. 60 AND 61



FIG. 2867

No. 60 has graduated blade, not hardened.

No. 61 has blade with hardened edge, not graduated.

Blades held to stock by patent bolt and nut.

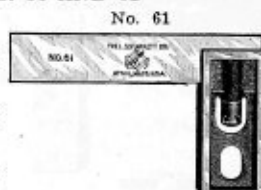


FIG. 2868

Length of Blade.....Inches	4	5	6	9	12	18	24
Length of Beam.....Inches	2 1/2	3	3 3/4	5 1/2	6	9	12
Price, No. 60.....	\$1.00	1.15	1.25	2.00	2.75		
Price, No. 61.....	1.25	1.50	1.75	2.25	3.00	12.00	18.00

NO. 63. GRADUATED HARDENED STEEL SQUARE

No. 63

This square has concave depressions in each side of the stock. Convenient to hold between the thumb and finger while being used. The stocks are case hardened, the blades hardened to spring temper and graduated in 32ds of an inch on one side and 64ths on the other.

2 inch blade, full length of beam 1 1/2 inch.....	\$1.75
3 inch blade, full length of beam 2 inch.....	2.50
4 inch blade, full length of beam 2 3/4 inch.....	3.75
6 inch blade, full length of beam 3 3/4 inch.....	5.00
9 inch blade, full length of beam 5 inch.....	8.00
12 inch blade, full length of beam 6 1/2 inch.....	9.50



FIG. 2869

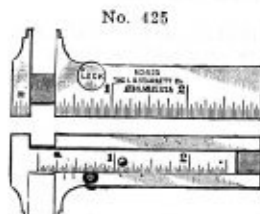


FIG. 2870

NO. 425. POCKET SLIDE CALIPERS

Graduated in 32ds and 64ths.

3 inch.....	\$2.00
5 inch.....	3.00

NO. 425A

Graduated in 32ds on the stock and 100ths on the slide. Price the same as No. 425.

STARRETT'S TOOLS

NO. 431. BUTTON GAGE

This gage is the same size and similar to the No. 425 Pocket Slide Caliper. The difference is that this gage is graduated on the slide only to 40ths of an inch.

Special attention is called to the fact that every fifth line is figured, so as to assist the user to more quickly read the 40ths, as shown in the cut.



FIG. 2871

3 inch.....	\$2.50
5 inch.....	3.50

NO. 25. CALIPER SQUARE

An improved tool for both outside and inside measure. The beam is graduated, 64ths on one side, 100ths on the other.

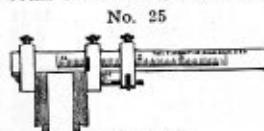


FIG. 2872

Sent with adjusting screw and without case unless otherwise ordered.

A 3 inch with adjusting screw..	\$5.00	D without..	\$4.25
B 4 inch with adjusting screw..	6.50	E without..	5.50
C 6 inch with adjusting screw..	9.00	F without..	7.00
With hardened jaws, extra.....	1.50		
In leatherette case, extra.....	.75		

NO. 426. CALIPER SQUARE

For Outside and Inside Measure.

The beam is nicely graduated on one side in 64ths and on the other in 100ths of an inch. With the adjusting screw the sliding head can be more accurately set to the graduations than without it. Sent with adjusting screw and without case unless otherwise ordered.



FIG. 2873

A 3 inch, with adjusting screw.....	\$5.00	D without.....	\$4.25
B 4 inch, with adjusting screw.....	6.50	E without.....	5.50
C 6 inch, with adjusting screw.....	9.50	F without.....	7.00
With hardened jaws, extra.....	1.50		
Leatherette case, extra.....	.75		

Sent with adjusting screw and without case unless otherwise ordered.

NO. 424. SLIDE RULE CALIPER AND CIRCUMFERENCE GAGE

No. 424



FIG. 2874

This gage has a double function—being graduated to read the circumference as well as the diameter of the thing measured, the relation of circumference to diameter being shown by the graduations on upper corners of the rule (capacity $3\frac{1}{2}$ inches, about 11 inches circumference). The jaws, being $1\frac{1}{2}$ inches deep, will caliper a cylinder up to $2\frac{1}{2}$ inches in diameter. The rule is graduated in 32ds of an inch standard and 16ths of an inch circumference measure.

Price Each \$4.00

RULE.—The circumference being shown by the gage, multiply the same by the speed the lathe runs per minute and the result will show the number of inches or feet the circumference is running and the tool cutting.

STARRETT'S TOOLS

CALIPER SQUARES NOS. 427 AND 428

No. 427

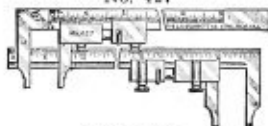


FIG. 2875

No. 428



FIG. 2876

This class of tools was designed primarily for use where extreme accuracy is not required, in measuring milled and planed surfaces, rough boring holes and in gaging duplicate pieces of work. They are made both plain and adjustable, the front side graduated to read in 64ths, and the reverse side graduated whole length in 32ds.

As shown by the cuts, the graduations on one side are brought down to the edge of the tool with nothing to interfere with applying the graduated edge close to the article to be measured.

No. 427.	4 in. plain, whole length 6 in.	\$4.75	In Leather case	\$5.75
No. 427.	6 in. plain, whole length 8 in.	6.25	In Leather case	7.50
No. 427.	4 in. adjustable, whole length 7 in.	6.00	In Leather case	7.00
No. 427.	6 in. adjustable, whole length 9 in.	7.75	In Leather case	9.00
No. 428.	4 in. plain, whole length 7 $\frac{1}{2}$ in.	4.75	In Leather case	5.75
No. 428.	6 in. plain, whole length 9 $\frac{1}{2}$ in.	6.25	In Leather case	7.50
No. 428.	4 in. adjustable, whole length 8 $\frac{1}{2}$ in.	6.00	In Leather case	7.00
No. 428.	6 in. adjustable, whole length 10 $\frac{1}{2}$ in.	7.75	In Leather case	9.00

MICROMETER CALIPER SQUARE NO. 28

No. 28

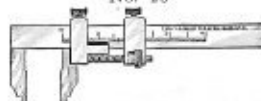


FIG. 2877

For Outside and Inside Measure

This instrument enables one to enlarge or decrease work one or more thousandths from that calipered. The jaws are 1 $\frac{1}{2}$ inches long, hardened, and open four inches. One side of the beam is graduated in 64ths and the other in 40ths; and either side may be used as a common caliper square, or, through the micrometer, to show 1000ths full length, on either inside or outside work.

4 inch, with case	\$11.75	Without	\$11.00
6 inch, with case	14.50	Without	13.50
9 inch, with case	18.75	Without	17.50
12 inch, with case	22.50	Without	21.00

Sent with case unless otherwise ordered.

MICROMETER CALIPER GAGES NO. 24

This gage is made to fit scales 1 $\frac{1}{4}$ inch wide, .085 inch thick, and 12, 18, 24 and 36 inches long, affording longer scope than anything of the kind heretofore made. The head of the gage carries auxiliary tram points. Attachments are also made to slip on and off the ends of the caliper, so that they may be used for making close or drive fits. For measuring distances, the gage may not only be set by the graduated scale, but varied by the micrometer adjusting nut to read additional thousandths.

12 inch	\$13.00	24 inch	\$16.50
18 inch	14.50	36 inch	20.00
48 inch			\$26.00

No. 123



FIG. 2879

POCKET VERNIER CALIPERS NO. 123

Graduated on the front to read in 1000ths of an inch.
Graduated on the back in 64ths.

Size	Length of Jaws	Width of Jaws	Price	Case Only
1 $\frac{1}{2}$	$\frac{1}{2}$ inch	.250	\$12.50	\$0.75

STARRETT'S TOOLS

QUICK ADJUSTING ONE INCH
MICROMETER CALIPERS

NO. 204

For measurements by thousandths up to one inch.
Has ratchet stop and lock nut.

Price Each \$10.00
Price in leather case..... Each 10.50

No. 204



FIG. 2880

No. 238



FIG. 2881

HEAVY ONE INCH MICROMETER CALIPERS
NO. 238

A heavy caliper to stand hard usage. For measurements by thousandths up to one inch. Has ratchet stop and lock nut.

Price Each \$7.50
With leather case..... Each 8.25

HEAVY MICROMETER CALIPERS

NO. 239

These calipers were designed to meet the exacting demands of heavy and severe usage. The spindle and screw portion is of larger area than in the regular micrometer, thus insuring longer wear and greater rigidity; those from two inch to six inch, inclusive, are made from drop forgings and the larger sizes, from seven inch to twelve inch, from steel castings. The bearing parts and measuring surfaces are hardened to prevent wear, and the same means provided for adjustment as in our other micrometers. Made with lock nut and ratchet stop. Sizes are stamped to show their capacity.

No. 239



FIG. 2882

1 inch to 2 inches....	\$ 8.50	With standard....	\$ 9.50	Leather case, extra....	\$1.00
2 inches to 3 inches....	9.50	With standard....	10.50	Leather case, extra....	1.25
3 inches to 4 inches....	10.50	With standard....	11.65	Leather case, extra....	1.75
4 inches to 5 inches....	11.50	With standard....	12.85	Leather case, extra....	2.00
5 inches to 6 inches....	12.50	With standard....	14.00	Leather case, extra....	2.25
6 inches to 7 inches....	13.50	With standard....	.....	.....	15.50
7 inches to 8 inches....	14.50	With standard....	.....	.....	16.75
8 inches to 9 inches....	15.50	With standard....	.....	.....	17.90
9 inches to 10 inches....	16.50	With standard....	.....	.....	19.10
10 inches to 11 inches....	17.50	With standard....	.....	.....	20.30
11 inches to 12 inches....	18.50	With standard....	.....	.....	21.50

Leather cases not supplied for sizes above 6 inch. Micrometers sent without case, and with standard unless otherwise ordered. Each size sent in a strong wooden box.

SCREW THREAD MICROMETER CALIPERS

NOS. 575 AND 585



FIG. 2883

	Capacity	Range	Form of Thread	Price
No. 575A	1 in.	8 to 13 threads	V & U. S. or Whit. Std.	\$8.00
No. 575B	1 in.	14 to 20 threads	V & U. S. or Whit. Std.	8.00
No. 575C	1 in.	22 to 30 threads	V & U. S. or Whit. Std.	8.00
No. 575D	1 in.	32 to 40 threads	V & U. S. or Whit. Std.	8.00
No. 585A	2 in.	4 1/2 to 7 threads	V & U. S. or Whit. Std.	9.50
No. 585B	2 in.	8 to 13 threads	V & U. S. or Whit. Std.	9.50
No. 585C	2 in.	14 to 20 threads	V & U. S. or Whit. Std.	9.50
No. 585D	2 in.	22 to 30 threads	V & U. S. or Whit. Std.	9.50

We can furnish these calipers in corresponding Metric sizes. We include a 1 inch standard with each 2 inch caliper at above list prices.

STARRETT'S TOOLS ONE INCH MICROMETER CALIPERS

Nos. 220 and 221 With
Finger Ring.



FIG. 2894

No. 220. For measurements by thousandths up to 1 inch. With lock nut and ratchet stop.

Price Each \$6.50
Price in leather case..... Each 7.15

No. 221. For measurements by ten thousandths up to $\frac{1}{2}$ inch. With lock nut and ratchet stop.

Price Each \$7.50
Price in leather case..... Each 8.15

No. 230. For measurements by thousandths up to 1 inch. Anvil is shortened for use where ordinary anvil is too long. Has lock nut and ratchet stop.

Price Each \$6.50
Price in leather case..... Each 7.15

No. 231. For measurements by ten thousandths up to 1 inch. Has lock nut, ratchet stop and short anvil.

Price Each \$7.50
Price in leather case..... Each 8.15

Nos. 230 and 231



FIG. 2895

Nos. 3 and 113



FIG. 2896

No. 3. For measurement by thousandths up to 1 inch. Has lock nut and ratchet stop.

Price Each \$6.50
Price in leather case..... Each 7.15

No. 113. For measurement by ten thousandths up to 1 inch. Has lock nut and ratchet stop.

Price Each \$7.50
Price in leather case..... Each 8.15

No. 203. For measurement by thousandths up to 1 inch. Has neither lock nut nor ratchet stop.

Price Each \$5.50
Price in leather case..... Each 6.15

No. 209. For measurement by ten thousandths up to 1 inch. Has neither lock nut nor ratchet stop.

Price Each \$6.50
Price in leather case..... Each 7.15

Nos. 203 and 209



FIG. 2897

Nos. 201 and 207

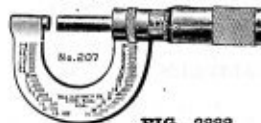


FIG. 2898

No. 201. For measurement by thousandths up to 1 inch. Has lock nut but no ratchet stop.

Price Each \$6.00
Price in leather case..... Each 6.65

No. 207. For measurement by ten thousandths up to 1 inch. Has lock nut but no ratchet stop.

Price Each \$7.00
Price in leather case..... Each 7.65

No. 202. For measurement by thousandths up to 1 inch. Has ratchet stop but no lock nut.

Price Each \$6.00
Price in leather case..... Each 6.65

No. 208. For measurement by ten thousandths up to 1 inch. Has ratchet stop but no lock nut.

Price Each \$7.00
Price in leather case..... Each 7.65

Nos. 202 and 208



FIG. 2899

No. 650 Yankee



FIG. 2890

No. 650. For measurement by thousandths up to 1 inch. An inexpensive caliper.

Without ratchet stop, without case..... Each \$4.00
Without ratchet stop, with case..... Each 4.65
With ratchet stop, without case..... Each 4.50
With ratchet stop, with case..... Each 5.15

STARRETT'S TOOLS

NO. 212 ATTACHMENT FOR TWO INCH MICROMETERS

This attachment, by means of which a 2 inch micrometer may be instantly converted into a 1 inch tool, will be furnished, when ordered, with any of the 2 inch or 50 millimeter micrometers.

Price Each \$2.00



FIG. 2891



FIG. 2892

TWO INCH MICROMETER CALIPERS

No. 2A. Micrometer with 1 inch attachment. This is the No. 2 micrometer fitted with No. 212 attachment.

Price Each \$9.00
Price with leather case..... Each 9.75

No. 2. For measurement by thousandths from 1 inch to 2 inches, with lock nut, ratchet stop and 1 inch test gage.

Price Each \$7.00
Price in leather case..... Each 7.75

No. 213. For measurement by ten thousandths from 1 inch to 2 inches, with lock nut, ratchet stop and 1 inch test gage.

Price Each \$8.00
Price in leather case..... Each 8.75

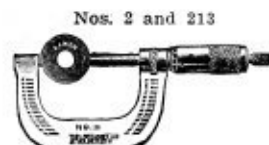


FIG. 2893

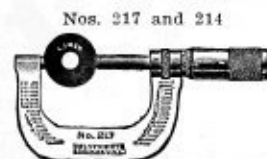


FIG. 2894

No. 217. For measurement by thousandths from 1 inch to 2 inches. Has lock nut and 1 inch test gage, but no ratchet stop.

Price Each \$6.50
Price in leather case..... Each 7.25

No. 214. For measurement by ten thousandths from 1 inch to 2 inches. Has lock nut and 1 inch test gage, but no ratchet stop.

Price Each \$7.50
Price in leather case..... Each 8.25

HALF-INCH MICROMETERS

No. 232. For measurement by thousandths up to $\frac{1}{2}$ inch. Anvil is shortened for use in places where ordinary anvil is too long. Has lock nut and ratchet stop.

Price Each \$5.50
Price in leather case..... Each 6.15

No. 233. For measurement by ten thousandths up to $\frac{1}{2}$ inch. Has lock nut, ratchet and short anvil.

Price Each \$6.50
Price in leather case..... Each 7.15



FIG. 2895

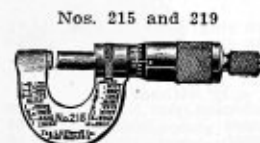


FIG. 2896

No. 215. For measurement by thousandths up to $\frac{1}{2}$ inch. Has lock nut and ratchet stop.

Price Each \$5.50
Price in leather case..... Each 6.15

No. 219. For measurement by ten thousandths up to $\frac{1}{2}$ inch. Has lock nut and ratchet stop.

Price Each \$6.50
Price in leather case..... Each 7.15

STARRETT'S TOOLS

Nos. 216 and 218



FIG. 2897

HALF-INCH MICROMETER CALIPER

No. 216. For measurement by thousandths up to $\frac{1}{2}$ inch. Has ratchet stop, but no lock nut.

Price Each \$5.00
 Price in leather case..... Each 5.65

No. 218. For measurement by ten thousandths up to $\frac{1}{2}$ inch. Has ratchet stop, but no lock nut.

Price Each \$6.00
 Price in leather case..... Each 6.65

No. 576. For measuring tubing. Same design as No. 232, but without lock nut. Face of anvil rounding. For measurements by thousandths up to $\frac{1}{2}$ inch, with decimal equivalents stamped on frame, with ratchet stop.

Price Each \$5.50
 Price with leather case..... Each 6.15
 Without ratchet stop, 50c less.



FIG. 2898

NO. 263. MICROMETER HEADS
ENGLISH, ONE INCH

These heads are easily attached to tools or machines when fine measurements are required. They have ratchet stops and lock nuts and are graduated to read to thousandths of an inch. They will be furnished without ratchet or lock nut when so ordered.

Price Each \$3.50

No. 263



FIG. 2899

HUB MICROMETER CALIPER

No. 228. For measurement by thousandths up to 1 inch. Has lock nut and ratchet stop. Useful in manufacture of cutters, where exact hub lengths are required. Frame will pass through a $\frac{3}{4}$ inch hole.

Price Each \$6.50
 Price with leather case..... Each 7.15



FIG. 2900

NO. 223. PAPER GAGE MICROMETERS
CALIPER WITH RING

This Micrometer is used in measuring the thickness of paper, sheet rubber, cardboard, etc. The discs are placed on the anvil and spindle so that measurements can be taken without compressing the articles measured. Measures all sizes less than $\frac{1}{2}$ of an inch by thousandths of an inch.

Without ratchet stop and with ring, without case.....\$6.75
 Without ratchet stop and with ring, with case..... 7.40
 With ratchet stop and with ring, without case..... 7.25
 With ratchet stop and with ring, with case..... 7.90

No. 225. Same as No. 223, only without ring.

Without ratchet stop, without case.....\$6.00
 Without ratchet stop, with case..... 6.65
 With ratchet stop, without case..... 6.50
 With ratchet stop, with case..... 7.15

Sent with ratchet and case unless otherwise ordered.

No. 223



FIG. 2901

STARRETT'S TOOLS

NO. 222. MICROMETER CALIPER SHEET METAL GAGES

This gage has 2 inch depth of throat to reach over the edge of sheet metal to gage its thickness nearer the center. Has $\frac{1}{2}$ inch movement of screw. The screw is covered by a patent shell with its indicator mark, which enables one to take up wear to a nicety and insures a correct reading, the anvil remaining solid. It also has the patent ratchet friction feed, which insures uniform pressure against the work without springing the frame, as well as the patent lock nut to lock the spindle firm when desired to make a solid gage. Decimal equivalents are stamped on the frame. Weight of gage, 3 ounces.

Price Each \$7.25
In leather case..... Each 8.00
Sent with case unless otherwise ordered.

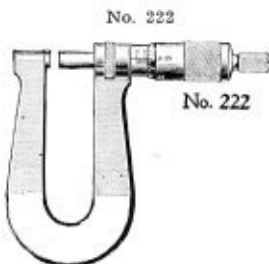


FIG. 2902

NO. 127. U. S. GOVERNMENT MICROMETER CALIPER GAGES

These gages were designed and made to meet the requirements of the government in making big guns and other work in government shops. The frames are cut from steel plates, nicely finished. The sides are covered with hard rubber, put on with brass screws, preventing inaccuracy through expansion caused by change in temperature when held in warm hands. The micrometer screw adjusts 1 inch, reading 1/1000 of an inch, and is provided with patent lock nut. The different length tail spindles, forming anvils, are interchangeable and have positive stops to set against their socketed seats. The adjusting collars on these anvils have notches to facilitate the removal of dirt, which would prevent them from setting accurately against the seat. The contact ends of spindles are slightly convex to prevent catching on cylindrical work. Furnished with ratchet stop or speeded screw thumb piece, as desired.



FIG. 2903

No. 127A. 0 to 4 in. \$25.00
No. 127B. 4 to 8 in. 37.00
No. 127C. 8 to 12 in. 50.00

Furnished in oak case without extra charge.

NO. 128. SIX INCH MICROMETER CALIPERS

This Micrometer will measure round work to $4\frac{1}{2}$ inches, and flat work to 6 inches. It weighs 21 ounces, and is rigid and accurate. It can be quickly set to exact position, from 1 inch to 6 inches, by inserting a plug as shown.

Price Each \$23.50
In leather case..... Each 25.00
Sent in case unless otherwise ordered.

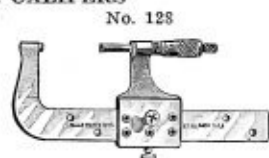


FIG. 2904

NO. 577. BENCH MICROMETER CALIPER



FIG. 2905

For measurements by thousandths or ten thousandths up to 1 inch.

This caliper is made with a heavy base, which makes a very rigid and accurate tool, and will be found of advantage to inspectors, watchmakers, etc., who need to take fine measurements on work of such a class that it can be better inspected when used on a bench. This caliper can also be supplied with regular anvil and spindle in place of those shown in cut when so desired.

Made with lock nut and ratchet stop. Can be supplied without ratchet stop at reduction of 50 cents from price given.

No. 577A. With points .075 diam., reading by thousandths. \$8.00
No. 577B. With regular points .235 diam., reading by thousandths. 7.50
No. 577C. Fine points .075 diam., reading by ten thousandths. 9.00
No. 577D. With regular points .235 diam., reading by ten thousandths. 8.50

STARRETT'S TOOLS

NO. 226. MICROMETER CALIPER SETS



FIG. 2906

These calipers meet the demand for accurate gages at a low price. They are better adapted for general use than the vernier or bar micrometer, as they can be set quickly for the different measurements and are more easily read.

Each caliper is graduated to read by thousandths of an inch, is furnished with patent lock nut, and is sent with or without ratchet stop, as desired.

The frames are drop forged from bar steel and are nicely finished.

The 1 inch has the decimal equivalents stamped on the frame. The other sizes are marked to show their capacity.

Standards for use in adjusting these micrometers will be furnished when desired.

Calipers will be supplied singly or in sets, as desired, and will be sent with ratchet stop and without leather case or standard unless otherwise ordered.

Size, 1 inch with decimal equivalents, our No. 201, without ratchet stop.....	\$6.00
Size, 1 inch with decimal equivalents, our No. 3, with ratchet stop.....	6.50
1 inch case only.....	.65
Size, 2 inch, from 1 inch to 2 inches, without ratchet stop.....	5.50
Size, 2 inch, from 1 inch to 2 inches, with ratchet stop.....	6.00
1 inch standard.....	1.00
2 inch standard.....	.75
Size, 3 inch, from 2 inches to 3 inches, without ratchet.....	6.50
Size, 3 inch, from 2 inches to 3 inches, with ratchet.....	7.00
2 inch standard.....	1.00
3 inch case only.....	1.00
Size, 4 inch, from 3 inches to 4 inches, without ratchet stop.....	7.00
Size, 4 inch, from 3 inches to 4 inches, with ratchet stop.....	7.50
3 inch standard.....	1.15
4 inch case only.....	1.50
Size, 5 inch, from 4 inches to 5 inches, without ratchet stop.....	7.75
Size, 5 inch, from 4 inches to 5 inches, with ratchet stop.....	8.25
4 inch standard.....	1.35
5 inch case only.....	1.75
Size, 6 inch, from 5 inches to 6 inches, without ratchet stop.....	8.50
Size, 6 inch, from 5 inches to 6 inches, with ratchet stop.....	9.00
5 inch standard.....	1.50
6 inch case only.....	2.00

Packed 1 in a box.

Case for Set of Three

CASES FOR NO. 226 MICROMETERS

The cases for these Micrometers are well made and nicely finished.

They are covered with morocco leather and lined with velvet.

PRICES FOR CASE ONLY

For set of 3.....	\$2.00
For set of 6.....	4.00



FIG. 2907

STARRETT'S TOOLS

MICROMETER CALIPER SETS NO. 226

The following Micrometer Caliper Sets have been selected from our general line of micrometer calipers to provide inexpensive, yet accurate, serviceable sets of calipers from 0 to 3 inches and 0 to 6 inches. They are better adapted for general use than the vernier or bar micrometer, as they can be set quickly for the different measurements and are more easily read.

Each micrometer is graduated to read by thousandths of an inch, is furnished with our patent lock nut (excepting our Yankee No. 650, 1 inch), and is sent with or without ratchet stop, as desired.

The frames are drop forged from bar steel and are nicely finished.

The 1 inch has the decimal equivalents stamped on the frame (excepting our Yankee No. 650, 1 inch). The other sizes are marked to show their capacity.

Standards for use in adjusting these micrometers will be furnished when desired at prices given below.

PRICES PER SET

		Without Case	With Case
No. 226A.	Set of three micrometer calipers comprising our Yankee No. 650 1-inch, No. 226 2-inch and 3-inch, all without ratchet stop.....	\$16.00	\$18.00
	Set of two standards for above.....	\$2.00	
No. 226B.	Set of three micrometer calipers comprising our Yankee No. 650 1-inch, No. 226 2-inch and 3-inch, all with ratchet stop.....	17.50	19.50
	Set of two standards for above.....	\$2.00	
No. 226C.	Set of three micrometer calipers comprising our No. 201 1-inch, No. 226 2-inch and 3-inch, all without ratchet stop.....	18.00	20.00
	Set of two standards for above.....	\$2.00	
No. 226D.	Set of three micrometer calipers comprising our No. 3 1-inch, No. 226 2-inch and 3-inch, all with ratchet stop.....	19.50	21.50
	Set of two standards for above.....	\$2.00	
No. 226E.	Set of six micrometer calipers comprising our Yankee No. 650 1-inch, No. 226 2-inch, 3-inch, 4-inch, 5-inch and 6-inch, all without ratchet stop	39.25	43.25
	Set of five standards for above.....	\$6.00	
No. 226F.	Set of six micrometer calipers comprising our Yankee No. 650 1-inch, No. 226 2-inch, 3-inch, 4-inch, 5-inch and 6-inch, all with ratchet stop..	42.25	46.25
	Set of five standards for above.....	\$6.00	
No. 226G.	Set of six micrometer calipers comprising our No. 201 1-inch, No. 226 2-inch, 3-inch, 4-inch, 5-inch and 6-inch, all without ratchet stop.....	41.25	45.25
	Set of five standards for above.....	\$6.00	
No. 226H.	Set of six micrometer calipers comprising our No. 3 1-inch, No. 226 2-inch, 3-inch, 4-inch, 5-inch and 6-inch, all with ratchet stop.....	44.25	48.25
	Set of five standards for above.....	\$6.00	

The above sets are sent without case, and without standards, unless ordered.

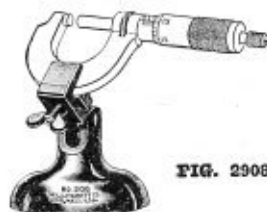


FIG. 2908

STARRETT'S TOOLS

MICROMETER CALIPER STAND NO. 206

Cut shows the Micrometer Stand with its improved shaped clamp and tilting bracket, so made that the micrometer with its measuring spindle will stand central over the base.

A turn of the wing nut locks both the hinged bracket and the micrometer in position for convenient use. Stands are all nicely finished and nickel plated.

Price Each \$2.00

STANDARD END MEASURING RODS NO. 234

These rods are made of steel, hardened and lapped spherical on the ends with a radius of one-half the length of the rod. The handles are of rubber, two-thirds the length of the rod, and guard against any expansion due to change in temperature when held in the hands, thereby maintaining their accuracy under adverse conditions. The 1 inch and 25 mm. are in the form of a round disc, as shown in cut.

2 inch to 6 inch are $\frac{1}{4}$ inch diameter with handles $\frac{1}{8}$ inch diameter.

6 inch to 12 inch are $\frac{3}{8}$ inch diameter with handles $\frac{5}{16}$ inch diameter.

1 inch Disc.....	\$1.00	5 inch	\$1.80
2 inch Rod.....	1.25	6 inch	2.00
3 inch	1.40	7 inch	2.20
4 inch	1.60	8 inch	2.40



FIG. 2909

9 inch	\$2.60
10 inch	2.80
11 inch	3.00
12 inch	3.20

INSIDE MICROMETER CALIPERS NO. 121

No. 121



FIG. 2910

When linear measurements are beyond the capacity of the ordinary micrometer it is frequently necessary to have a more accurate instrument than the rule or steel tape. The inside calipers shown here were designed for and are now used by the government in navy yards and arsenals. They consist of steel tubes with telescoping extensions combined with a 1-inch screw micrometer movement. The tubes are accurately graduated and figured in inches and set to the inch marks showing the length wanted, and are firmly held by a knurled locking nut. The ends of the rods have hardened steel anvils. Combinations are possible which

give a range from 32 to 107 inches and with micrometer accuracy over the whole range. A case is furnished with each set.

Set A. Stock with one rod, 32 to 57 inches.....	\$25.00
Set B. Stock with two rods, 32 to 82 inches.....	30.00
Set C. Stock with three rods, 32 to 107 inches.....	37.50

INSIDE MICROMETER CALIPERS NO. 120.

Both screw and nut reading in thousandths. Set A measures from 2 inches to 8 inches, has $\frac{1}{2}$ inch movement of screw and requires four extension rods. A small binding screw locks rods when set. Rods are marked in $\frac{1}{16}$ inch divisions and set to a similar line on a projection of the barrel.

Set C is similar in all respects with the exception that it measures from 8 inches to 32 inches, with four extension rods, and has 1 inch movement of the screw.

When so ordered an auxiliary handle accompanies sets A, B and D, which is used by removing the nut opposite the lock nut and screwing the handle in place of same, thereby enabling one to take measurements in holes and other places.

Set C. No. 120



FIG. 2912

Set A. No. 120

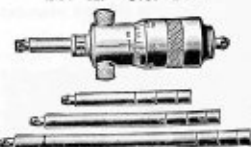


FIG. 2911

	With Case	Without Case
Set A. With 4 rods, to measure from 2 to 8 inches.....	\$4.75	\$1.00
Set B. With 7 rods, to measure from 2 to 12 inches.....	6.00	5.00
Set C. With 4 rods, to measure from 8 to 32 inches.....	7.25	5.75
Set D. Comprising sets A and C.....	11.25	9.75
Handle, extra.....		.50
Extra rods at 5 cents per inch. Sent with case unless otherwise ordered.		

STARRETT'S TOOLS

INSIDE MICROMETER CALIPERS NO. 124

No. 124 is designed for internal and lineal measurements, such as measuring cylinders, rings; also for setting calipers, comparing gages, etc. It is also useful in measuring parallel surfaces. The micrometer screw in the head has $\frac{1}{2}$ inch movement in sets A and B, 1 inch in set C, and, by means of the extension rods furnished, the sizes as given below for each set can be obtained.

Set A has 6 rods and one $\frac{1}{2}$ inch gage, and measures from 2 inches to 8 inches.

Set B has 10 rods and one $\frac{1}{2}$ inch gage, and measures from 2 inches to 12 inches.

Set C has 4 rods and one 1 inch and two 2 inch gages, and measures from 8 inches to 32 inches.

Set D comprises sets A and C, and measures from 2 inches to 32 inches.

No. 124. Set A



FIG. 2913

No. 124. Set C



FIG. 2914

Set A. Without case.....	\$ 4.50	With case.....	\$ 5.25
Set B. Without case.....	5.50	With case.....	6.50
Set C. Without case.....	6.50	With case.....	8.00
Set D. Without case.....	11.00	With case.....	12.50
Handle, extra.....			.50

Sent with case unless otherwise ordered.

MICROMETER CALIPER GAGES NO. 126

Designed for close internal measurements, indicating thousandths where a definite distance in inches is not essential. The body of the tool is a steel tube provided at one end with a binding chuck in which are fastened the plain rods, and it can quickly be adjusted to any approximate size. The other end has sleeve and body of barrel marked and graduated same as the No. 3 Micrometer Caliper, giving a reading in thousandths, and has $\frac{1}{4}$ inch movement of screw. Anvil in end of sleeve is hardened, as are those in ends of rods. Capacity, $2\frac{1}{2}$ inch to 10 inch (with five rods).

Price Each \$2.00

Price in leather case..... Each 2.75

Extra rods at 3 cents per inch. Sent without case unless otherwise ordered.

No. 126



FIG. 2915

ADJUSTABLE CALIPER GAGE NO. 125

Designed for internal measurements of large cylinders and of distances between uprights. To set the gage, loosen the chuck that clamps the wire rod, slide the rod out or in to the required size, and clamp it. If not quite correct, loosen the chuck on the opposite end and turn the anvil out or in what little is needed.

$2\frac{1}{2}$ inch with three rods, capacity from $2\frac{1}{2}$ inch to

$6\frac{1}{4}$ inch. Price.....\$1.00

6 inch with three rods, capacity from 6 inch to 16

inch. Price.....1.25

The diameter of the steel rods is .150 inch. Extra rods furnished at 3 cents per inch.

No. 125



FIG. 2916

TELESCOPING INSIDE GAGES NO. 229

These are instruments from which the exact size of holes or slots can be taken by an outside caliper or micrometer, so that shrink, close or loose fits, varying in thousandths, or less, can be made and measured.

The gages are made in sizes to enter holes from $\frac{1}{2}$ inch to 6 inches.

No. 229A. Range $\frac{1}{2}$ inch to $\frac{3}{4}$ inch.....Each \$1.50

No. 229B. Range $\frac{3}{4}$ inch to $1\frac{1}{4}$ inch.....Each 1.75

No. 229C. Range $1\frac{1}{4}$ inch to $2\frac{1}{4}$ inch.....Each 2.00

No. 229D. Range $2\frac{1}{4}$ inch to $3\frac{1}{2}$ inch.....Each 2.50

No. 229E. Range $3\frac{1}{2}$ inch to 6 inch.....Each 3.00



FIG. 2917

STARRETT'S TOOLS

UNIVERSAL BEVEL PROTRACTORS NO. 360

This tool weighs six ounces. The blade is either 7 or 12 inches by $\frac{1}{2}$ inch; the stock 4 inches long, and both are made from sheet steel, nicely finished. The disc is graduated in degrees from 0 to 90 each way, and rotates the entire circle on a central stud inside the case.

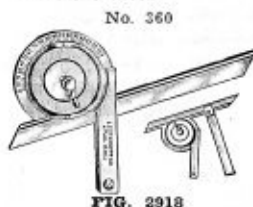


FIG. 2918

No. 360A.	7 inch	\$7.00
No. 360B.	7 inch in leather case.....	7.75
No. 360C.	12 inch	8.00
No. 360D.	12 inch in leather case.....	9.00
No. 360E.	With both 7 and 12 inch blades.....	8.50
No. 360F.	Same in leather case.....	9.50
No. 360G.	Attachment, extra.....	1.00
No. 360B (7 inch in case) sent unless otherwise ordered.		

UNIVERSAL BEVEL PROTRACTORS WITH VERNIER NO. 362

This protractor is the same as the No. 360, except that it is made with verniers reading five minutes or one-twelfth of a degree.

The verniers are so placed with relation to the graduated half circle as to make the protractor readable by vernier in any position.

No. 362A.	7 inch	\$10.00
No. 362B.	7 inch in leather case.....	11.00
No. 362C.	12 inch	11.00
No. 362D.	12 inch in leather case.....	12.50
No. 362E.	With both 7 and 12 inch blades.....	11.75
No. 362F.	Same in leather case.....	13.75
No. 362G.	Attachment as with No. 360, extra....	1.00

No. 362B (7 inch, in leather case) sent unless otherwise ordered.

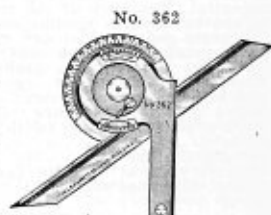


FIG. 2919

UNIVERSAL BEVEL PROTRACTORS WITH VERNIER AND ACUTE ANGLE ATTACHMENT NO. 364

This protractor is the same as the No. 362, with the addition of the acute angle attachment, which enables the user to obtain very small angles.



FIG. 2920

No. 364A.	With 7 inch blade	\$12.50
No. 364B.	With 7 inch blade in leather case.....	13.50
No. 364C.	With 12 inch blade	13.50
No. 364D.	With 12 inch blade in leather case.....	15.00
No. 364E.	With both 7 and 12 inch blades.....	14.25
No. 364F.	Same as E in leather case.....	16.25

No. 364A sent unless otherwise ordered.

NOTE.—The acute angle attachment as used on the No. 364 can also be used on our No. 362 and No. 360 Protractors.

Price for acute angle attachment, only.....\$2.50

STARRETT'S TOOLS

No. 19



FIG. 2921

No. 182

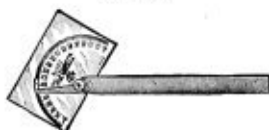


FIG. 2922

NO. 19 PROTRACTOR

Graduated in degrees from 0 to 90, both ways. The blade is 6 inches long, and, by means of patent lock joint, is set firmly by a slight turn of the nut. The back of the tool is flat.

Price	Each \$1.75
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NO. 183 PROTRACTOR

Similar to No. 19, but with rectangular head, giving four working faces; also two rows of figures.

Price Each \$2.00

NO. 193 PROTRACTOR

Used for setting bevels No. 15, No. 47 and No. 49 at any desired angle, thus converting them into bevel protractors at slight cost.

Price Each \$1.00



FIG. 2923

BEVELS

No. 49



FIG. 2924

No. 15



FIG. 2925

No. 47

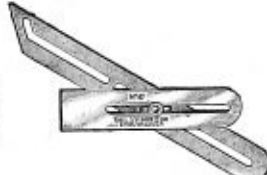


FIG. 2926

No. 49. Combination Bevel, stock about 4 in. long.....Price each \$2.00

No. 15.	Universal Bevel, 3 inch.....	Price each	1.50
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No. 47.	Improved Bevel, 6 in. (length of stock 3½ in.).....	Price each	1.25
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9 in. (length of stock 43% in.).....	Price each	1.50
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12 in. (length of stock 6 in.)	Price each	1.75
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STARRETT'S TOOLS

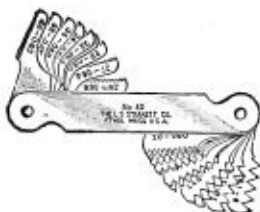


FIG. 2927

NO. 40 IMPROVED SCREW PITCH GAGE

This gage has twenty-two pitches, viz.: 9, 10, 11, 11½, 12, 13, 14, 15, 16, 18, 20, 22, 24, 26, 27, 28, 30, 32, 34, 36, 38, 40, can be used inside a nut as well as on the outside of a screw or bolt.

Price each.....\$1.00

NO. 5 SCREW PITCH GAGE

26 Pitches, 32 to 82

Of the same form as No. 40, for inside and outside work. Has the following pitches: 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82.

Price each.....\$1.25



FIG. 2928

NO. 4 SCREW PITCH GAGE

24 Pitches, 4 to 30

Has the following pitches: 4, 4½, 5, 5½, 6, 7, 8, 9, 10, 11, 11½, 12, 13, 14, 15, 16, 18, 20, 22, 24, 26, 27, 28, 30. The teeth are sharp and clean cut. Like our No. 40 it can be used inside of a nut as well as on outside of a screw or bolt. It is also a convenient and reliable tool to use as a 60-degree center gage and gage to test the grinding of either an inside or outside threading tool.

Price each.....\$1.25

NO. 6 SCREW PITCH GAGE

30 Pitches, 4 to 42

Of the same form as No. 4. Has the following pitches: 4, 4½, 5, 5½, 6, 7, 8, 9, 10, 11, 11½, 12, 13, 14, 15, 16, 18, 20, 22, 24, 26, 27, 28, 30, 32, 34, 36, 38, 40, 42.

Price each.....\$1.50



FIG. 2929

NO. 7 WHITWORTH SCREW PITCH GAGE

26 Pitches, 4 to 60

For Whitworth standard thread only.

No. 7 has the following pitches: 4, 4½, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 19, 20, 22, 24, 25, 26, 28, 30, 32, 40, 48, 60.

Price each.....\$1.25

NO. 155 U. S. STANDARD SCREW PITCH GAGE

No. 155 has 25 pitches, viz.: 2½, 3, 3½, 3¾, 4, 4½, 5, 5½, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 20. Also a center gage with coarse and fine notch.

Price each.....\$1.50

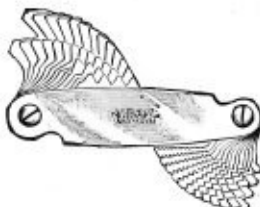


FIG. 2930

NO. 157 BICYCLE SCREW PITCH GAGE

Has 22 pitches. Similar in design to No. 40 shown above. It is made for the use of bicycle manufacturers, electricians, and others using screws with fine V threads.

It has the following pitches: 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74.

Price each.....\$1.00

STARRETT'S TOOLS

INTERNATIONAL STANDARD SCREW PITCH
GAGE NO. 158

It is made after the French system adopted by the Society for Encouragement of National Industries.

The leaves are stamped to show, on the same leaf, in millimeters, both the pitch and the diameter of bolt.

The gage contains the following pitches: .05, 0.75, 1, 1.25, 1.5, 1.75, 2, 2.5, 3, 3.5, 4, 4.5, 5, 5.5, 6, 6.5 and 7 millimeters. This gage also contains a center gage with coarse and fine notches, for use in grinding thread tools.

Price\$1.00

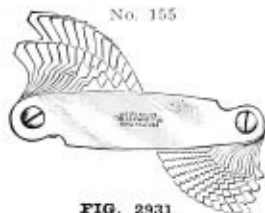


FIG. 2931

POSITIVE STOP THREAD GAGE NO. 473

30 Pitches, 6 to 60 V Thread.

No. 473



FIG. 2932

This gage has a positive stop which holds the blade in a fixed and convenient position for use.

It has 30 pitches from 6 to 60 inclusive, as follows: 6, 7, 8, 9, 10, 11, 11½, 12, 13, 14, 15, 16, 18, 20, 22 in one end of the case.

24, 26, 27, 28, 30, 32, 34, 36, 38, 40, 42, 48, 50, 56, 60 in the other.

The number of pitch is stamped on the right side of each blade.

Price\$1.50

POSITIVE STOP THREAD GAGE NO. 474

30 Pitches, 26 to 82 V Thread.

This gage is similar in design to the No. 473, shown on the preceding page, but has finer pitches and will therefore meet the requirements of automobile and bicycle manufacturers, electricians and others using screws with fine V thread.

The gage contains 30 blades with pitches as follows:

26, 27, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52 in one end of the case.

54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82 in the other.

Price\$1.50

POSITIVE STOP THREAD GAGE NO. 475

26 Pitches. V Thread.

This gage is similar in design to the No. 473, but larger, and has coarse pitches containing 26 blades as follows:

3½, 4, 4½, 5, 5½, 6, 7, 8, 9, 10, 11, 11½, 12 in one end of the case.

13, 14, 15, 16, 18, 20, 22, 24, 26, 28, 30, 32 in the other.

Price\$1.25

POSITIVE STOP THREAD GAGE NO. 476

30 Pitches, 3½ to 60, Whitworth Standard.

No. 476



FIG. 2933

This gage is put up in the same size case as the No. 473 and contains 30 blades as follows:

3½, 4, 4½, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18 in one end of the case.

19, 20, 22, 24, 25, 26, 28, 30, 32, 36, 40, 44, 48, 50, 60 in the other.

Price\$1.50

All of above packed 1 in a box.

STARRETT'S TOOLS

FILET OR RADIUS GAGE

No. 178



FIG. 2934

This gage may also be described as a concave and convex gage, and is especially adapted for use in laying out special forming tools, dies, etc., as well as for measuring fillets.

Size A has 30 leaves stamped to indicate radii by 64ths, from $\frac{1}{16}$ to $\frac{1}{4}$ in. (one-half diametric size). Diameters are from $\frac{1}{16}$ in. to $\frac{1}{2}$ in., varying by 32ds.

Size B is made with 32 leaves stamped to indicate radii by 64ths, from $\frac{1}{16}$ in. to $\frac{1}{2}$ in. Diameters are from $\frac{1}{16}$ in. to 1 in., varying by 32ds.

No. 178A.....	Each \$1.00
No. 178B.....	Each 1.50

THICKNESS GAGE OR "FEELER" NO. 72

This gage has 22 leaves, varying in thickness by thousandths, running from .004 to .025. The thickness of each leaf is designated by the number upon it. Each leaf may be used singly or in combination with others, and any thickness in thousandths within their limits may be quickly obtained. The leaves fold within the case, which is $2\frac{3}{4}$ inches long.

Price Each \$1.50

No. 72



FIG. 2935

No. 172



FIG. 2936

THICKNESS GAGE NO. 172

Size A has nine leaves, viz., .0015, .002, .003, .004, .006, .008, .010, .012 and .015.

Sizes B and C have eight leaves the same as A with the omission of .0015.

The leaves are tempered and have the thickness marked upon them.

Size A is made with either straight leaves as shown, or with tapering leaves as shown in No. 172M. Sent with straight leaves unless otherwise ordered.

Sizes B and C are made with tapering leaves only, as shown in No. 172M.

No. 172A. Case $3\frac{1}{4}$ inches long by $\frac{1}{2}$ inch wide; $3\frac{1}{4}$ inches long by $\frac{1}{2}$ inch wide..	\$1.00
No. 172B. Case $4\frac{1}{4}$ inches long by $\frac{1}{2}$ inch wide; leaves $4\frac{1}{2}$ inches long by $\frac{1}{2}$ inch wide.....	1.50
No. 172C. Case $6\frac{1}{4}$ inches long by $\frac{1}{2}$ inch wide; leaves 6 inches long by $\frac{1}{2}$ inch wide.....	2.00

Size A will be sent unless otherwise ordered.

ENGINEERS' TAPER, WIRE AND THICKNESS GAGE NO. 245

This gage is especially designed for the use of marine engineers, machinists and others desiring a set of gages in compact form.

The taper gage shows the thickness in 64ths to $\frac{1}{8}$ ths of an inch on one side, and on the reverse side is graduated as a rule three inches of its length, reading in 8ths and 16ths of an inch.

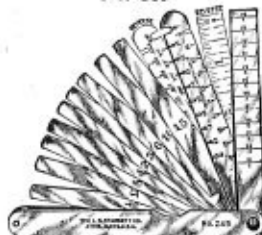


FIG. 2937

The wire gage, English Standard, shows on one side sizes numbered from 19 to 36, with two extra slots, one $\frac{1}{16}$, the other $\frac{1}{8}$ of an inch, and on the reverse side shows the decimal equivalents expressed in thousandths.

This gage has also 9 thickness or feeler gage leaves, approximately 4 inches long, of the following thicknesses: .002, .003, .004, .006, .008, .010, .012, .015 and $\frac{1}{16}$ th of an inch, all folded within the case, which is $4\frac{1}{4}$ inches long, convenient to handle or to carry in the pocket.

Price Each \$4.00

STARRETT'S TOOLS

PLANER AND SHAPER GAGE NO. 246

The level in the base of the gage is convenient for leveling pieces on the platen of a planer or the bed of a milling machine. Placing the square end of the level base against a finished point of work with which another point is required to be planed or milled to agree, the level used as a plumb will indicate when the position is right.

The gage with extensions will give any height between $\frac{1}{2}$ and $5\frac{1}{2}$ inches.

Price\$3.75



FIG. 2938

No. 45

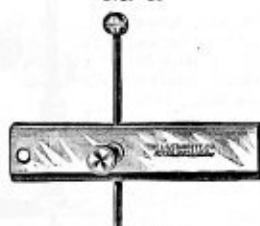


FIG. 2939

DEPTH GAGE NO. 45

The wire in this gage is held to a groove by a friction spring inside the nut while adjusting and may be used close to the end, as well as in the middle of the straight edge. By loosening the nut the gage may be neatly folded.

No. 45A. With $3\frac{1}{2}$ inch stock. Price.....Each \$0.75
No. 45B. With 6 inch stock. Price.....Each 1.15
No. 45C. With 10 inch stock. Price.....Each 1.35

DEPTH GAGE NO. 46

Has in place of the round wire to slide in the groove, as shown with No. 45, a 4-inch or 6-inch scale, $\frac{1}{8}$ inch wide, graduated in either 32ds and 64ths, 50ths and 100ths, or 64ths and 100ths, indicating exact measurements, and may be used separately from the gage.

46A with $3\frac{1}{2}$ in. stock and 4 in. scale. Price..Each \$1.25
46B with $3\frac{1}{2}$ in. stock and 6 in. scale. Price..Each 1.50
46C with 6 in. stock and 4 in. scale. Price..Each 1.50
46D with 6 in. stock and 6 in. scale. Price..Each 1.75
46E with 10 in. stock and 6 in. scale. Price..Each 2.25

No. 46

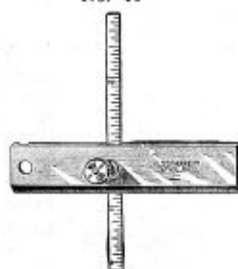


FIG. 2940

No. 237



FIG. 2941

DEPTH GAGE NO. 237

The head of this gage is steel, nicely finished and case-hardened; 2 inches wide across the base, $\frac{1}{8}$ inch thick.

The blade which is conveniently held in the groove of the head by a knurled lock nut, is a 6 inch narrow spring tempered rule, the same as furnished with our No. 46 Depth Gage and can be used separately from the gage. Blades graduated in 32ds and 64ths of an inch will be sent unless otherwise ordered, but we can also supply them graduated in 50ths and 100ths, or 64ths and 100ths.

Price\$1.25

No. 447



FIG. 2942

STARRETT'S TOOLS

HEIGHT GAGE ATTACHMENT, NO. 447

This cut shows a steel base for holding our inside micrometer No. 124, sets A and B, for use as a height gage. The anvil end is even with the bottom of the base and the micrometer is held perpendicularly, making a reliable gage. A slight turn of the knurled screw instantly clamps it to or releases it from the base.

Price, attachment only.....\$1.75

MICROMETER DEPTH GAGE, NO. 446.

This gage is designed for measuring the depth of grooves, holes or irregular parts. It has $\frac{1}{2}$ inch movement of the screw, reading in thousandths, and with two $\frac{1}{2}$ inch and one 1 inch standard collars to slip off or on the spindle, $2\frac{1}{2}$ inches, reading in thousandths, can be obtained. The head is about $\frac{3}{10}$ inch thick and $2\frac{1}{2}$ inches long; this and the point of measuring rod are hardened.

The head carries with it a knurled set screw for locking the spindle to prevent changing after being set.

No. 446A. $2\frac{1}{2}$ inch base with case.....\$6.00 Without case.....\$5.50

No. 446B. 4 inch base with case..... 6.75 Without case..... 6.00

Sent without case unless otherwise ordered

No. 448



FIG. 2944

VERNIER DEPTH GAGE, NO. 448

This gage is invaluable where accurate measurements are necessary and appeals to that class of mechanics whose work requires very close limits, such as gaging the depth of recesses, in jig work, etc. The blade is 6 inches long, $\frac{1}{2}$ inch wide, and will measure to $3\frac{1}{2}$ inches depth. The blade is graduated to read by means of a vernier to thousandths of an inch on one edge and to 64ths on the other.

Price, without case.....\$11.00

Leather case, extra..... 1.00

No. 446



FIG. 2943

PATENT INSPECTOR'S GAGE, NO. 30.

This gage was designed at the suggestion of a government inspector for measuring the thickness of ship plates, boiler plates, etc., where measure has to be taken through a bolt hole, or hole drilled for the purpose.

The slide measuring rod is graduated on two opposite sides, one side reading 32ds, the other 40ths.

The gage weighs about 1 ounce and is adapted for the vest pocket. Width, 1 inch. Capacity, $1\frac{1}{2}$ inch.

Price\$2.00

No. 31



FIG. 2946

PATENT INSPECTOR'S GAGE, NO. 31.

This gage is similar to No. 30, but is made narrower for use in smaller holes. Width, $\frac{3}{8}$ inch. Capacity, $1\frac{1}{2}$ inch.

Price\$2.00

No. 30



FIG. 2945

STARRETT'S TOOLS

TOOL MAKERS' PARALLEL CLAMPS NO. 161.

These clamps are made of steel, case hardened, and are very useful for holding small work together, in tapping, drilling, etc.

	Opening of Jaw	Length of Jaw	Per Pair (2 Clamps)
No. 161AA	$\frac{3}{4}$ inch	1 $\frac{5}{8}$ inch	\$1.20
No. 161A	$1\frac{1}{4}$ inch	2 inch	1.40
No. 161B	$1\frac{3}{4}$ inch	2 $\frac{1}{2}$ inch	1.70
No. 161C	2 $\frac{1}{4}$ inch	3 inch	2.00
No. 161D	2 $\frac{3}{4}$ inch	4 inch	2.20

No. 161



FIG. 2947

TOOL MAKERS' STEEL CLAMPS NO. 160.

These clamps are made from drop forgings, nicely finished, case hardened, and have take-up blocks to slip on or off end of screw, and are held to same in a novel manner. They will hold work square and parallel for laying out on surface plates, fitting or drilling. A round piece may be rigidly held in two of the clamps and drilled on an upright, central and parallel. Put up and sold in pairs.

1 inch.....	Per pair	\$2.00
2 inch.....	Per pair	2.50

No. 160



FIG. 2948

CLAMP DOGS, NO. 138

No. 138A.	$\frac{3}{4}$ inch between screws.....	Each	\$0.75
No. 138B.	$1\frac{1}{4}$ inch between screws.....	Each	1.25
No. 138C.	$1\frac{3}{4}$ inch between screws.....	Each	1.50
No. 138D.	2 $\frac{1}{4}$ inch between screws.....	Each	1.75
No. 138E.	2 $\frac{3}{4}$ inch between screws.....	Each	2.00
Per set of five sizes.....			7.00

No. 138



FIG. 2949

PARAMOUNT INDESTRUCTIBLE PRESSED STEEL CLAMPS, NO. 445

	Length of Jaw	Opening	Each
No. 445A	4 $\frac{1}{2}$ inch	3 $\frac{3}{4}$ inch	\$0.90
No. 445B	6 inch	4 $\frac{1}{2}$ inch	1.00
No. 445C	7 $\frac{1}{2}$ inch	5 $\frac{1}{2}$ inch	1.35
No. 445D	8 $\frac{1}{2}$ inch	6 $\frac{1}{2}$ inch	1.75
No. 445E	12 inch	8 inch	2.50

No. 445



FIG. 2950

STEEL DRILL BLOCKS AND CLAMPS, NO. 271

These blocks are designed to be used singly or in pairs in connection with drill presses and for laying out work, prick punching, etc. The blocks may be used close together or separated and are kept in line by a spindle passing through friction bushings. They will be found convenient when holding pieces with shoulders, which may rest between the blocks. The blocks are $1\frac{1}{4}$ inch square and will hold round pieces to $1\frac{1}{4}$ inch diameter. The two grooves in each side take up the length and hold the clamp for small or large work.

No. 271A.	Two drill blocks.....	\$2.00
No. 271B.	Clamp	.75
No. 271C.	Set, complete.....	2.75

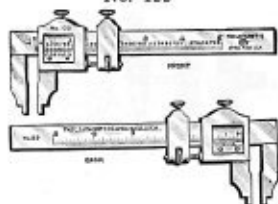
No. 271



FIG. 2951

STARRETT'S TOOLS

No. 122



NO. 122 VERNIER CALIPERS

These calipers are graduated in either or both English and Metric divisions for outside and inside measure, and are warranted accurate. Points are placed on the beams and slides for setting dividers to transfer distances. Full directions for using the Vernier are sent with each caliper.

We can furnish a quarter inch cylindrical plug standard for testing the adjustment of the caliper when desired. Price \$3.00.

Graduated on the front to read by means of the Vernier in 1000ths of an inch. Graduated in 64ths on the back.

FIG. 2952

Size	Length of Jaws	Width of Jaws	Price, Each	Cases Only
4 inch	1 $\frac{1}{8}$ inch	.250 inch	\$16.00	\$0.75
6 inch	1 $\frac{1}{8}$ inch	.250 inch	18.00	1.00
9 inch	2 $\frac{1}{8}$ inch	.300 inch	21.50	1.25
12 inch	2 $\frac{1}{8}$ inch	.300 inch	24.00	1.75
24 inch	2 $\frac{1}{8}$ inch	.300 inch	33.00	2.00

Sent with case unless otherwise ordered.

"LITTLE GIANT" JACK SCREWS

These are designed for tool-room use, for leveling up work on a planer bed or under an upright drill, setting up machinery, etc. All parts are case hardened.

No. 190. The Jack (A) is 1 $\frac{1}{4}$ inch in diameter at the base and has a range from 2 $\frac{1}{2}$ to 3 $\frac{1}{2}$ inches. It will raise 1,000 pounds or more. Two extension bases (B and C) are made to fit the base of the main part (A) and are 2 and 1 inch high, respectively.

No. 191. A smaller size is made, 1 inch diameter. Part A, 1 $\frac{1}{2}$ in. high; B, 1 in.; C, $\frac{1}{2}$ in. With this size, adjustments from 1 $\frac{1}{2}$ to 3 $\frac{1}{2}$ in. are obtainable.

Prices are for either No. 190 or 191.

Jack (A).....	\$0.75	Extension Base (E).....	\$0.15
Extension Base (B).....	.20	Extra Screw (D).....	.15
Extension Base (C).....	.15	Jack with all attachments.....	1.40

Sent complete (\$1.40) unless otherwise ordered.



FIG. 2953

No. 65



FIG. 2954

NO. 65 CENTER TESTER

This instrument was designed to use in adjusting and locating centrally any point or hole in a piece of work operated upon in a lathe chuck or on a face-plate; also to test the truth of lathe centers, or a shaft between the centers, the instrument being held in the tool post.

Price Each \$2.50

NO. 64 UNIVERSAL TEST INDICATOR

It may be used to test and show the imperfections or truth of inside, outside or surface work. It can be instantly attached to the spindle or to the needle of any surface gage and used in connection with same to show the slightest variation in thousandths. It may be clamped to a flat or round support, varying in size from a surface gage needle up to $\frac{1}{8}$ inch, flat or round.

Indicator only.....	\$2.50
Tool Post Holder, without arm.....	.75
Tool Post Holder, with arm.....	1.00
Indicator, with Tool Post Holder, complete.....	3.50

Sent complete unless otherwise ordered.

Consult Page 1045 on surface gages, to any of which this indicator may be applied.

No. 64



FIG. 2955

STARRETT'S TOOLS

IMPROVED SCRIBER NO. 67

Length, with short, bent point, 9 inches; with long point, 12 inches. All parts are interchangeable. The knurled sleeve is nickel-plated.

Complete	\$0.50
Without long point	.35
Straight point, long or short bent point	Each .10
Long bent point	Each .15

The tool will be sent complete unless otherwise ordered.

No. 67



FIG. 2956

IMPROVED ADJUSTABLE SLEEVE SCRIBER NO. 68

This scriber is made in two lengths, 8 inches and 12 inches. Tool makers will find the small size more desirable for general use, and the larger one for heavier work. For pattern makers a knife scriber, made of a fine grade of steel, is supplied as an auxiliary.

Either size, without knife point	\$0.50
Knife point, extra	.15
Extra scriber points	Each .20

The 8 inch, being the more popular size, will be sent (without knife point) unless otherwise ordered.

No. 68



FIG. 2957

POCKET SCRIBER NO. 70

This tool is made from steel tubing, knurled and nickel plated. The scriber is reversible, telescoping into the stock, and is held by a slight turn of the chuck so that it is always as safe to carry in the pocket as a penknife.

No. 70A. Handle $\frac{1}{4}$ in. diam., blade $2\frac{3}{4}$ in. long, weight, 1 oz.	\$0.25
No. 70B. Handle $\frac{3}{8}$ in. diam., blade $2\frac{3}{4}$ in. long, weight $1\frac{1}{2}$ oz.	.35

No. 70



FIG. 2958

No. 162



FIG. 2959

PIN VISES NO. 162

For Holding Scribers, etc.

Capacity

No. 162A. .0 inch to .040 inch	\$0.55
No. 162B. .030 inch to .062 inch	.55
No. 162C. .050 inch to .125 inch	.55
No. 162D. .115 inch to .187 inch	.75
Set complete (one of each size)	2.40

IMPROVED MERCURY PLUMB BOBS NO. 87

These plumb bobs are made from solid steel bored and filled with mercury. Noteworthy features are their great weight in proportion to size, low center of gravity, small diameter, hardened and ground points, knurling on body and the simple and effective device at top for fastening end of line after winding up. Each is provided with a braided silk line.

Price, Nickel Plated

4 inches long, $\frac{1}{4}$ inch diameter, $3\frac{1}{2}$ ounces	Each \$1.00
5 inches long, $\frac{3}{8}$ inch diameter, 6 ounces	Each 1.50
$5\frac{1}{2}$ inches long, $\frac{7}{8}$ inch diameter, 12 ounces	Each 2.00
6 inches long, 1 inch diameter, 16 ounces	Each 2.50

STEEL PLUMB BOBS NO. 177

Same as No. 87, but made of solid steel.

4 inches long, $\frac{1}{4}$ inch diameter, $2\frac{3}{4}$ ounces	Each \$0.75
5 inches long, $\frac{3}{8}$ inch diameter, 5 ounces	Each 1.00
$5\frac{1}{2}$ inches long, $\frac{7}{8}$ inch diameter, $8\frac{1}{2}$ ounces	Each 1.50
6 inches long, 1 inch diameter, $14\frac{1}{2}$ ounces	Each 2.00

No. 87 Sectional



FIG. 2960

STARRETT'S TOOLS

SCRATCH GAGE NO. 29

This gage is made of steel with hardened cast steel head. Through it is a split bushing, against which the set screw acts to hold it firm. The beam is graduated in either 50ths or 64ths of an inch. The marker is a thin square piece of steel, nicely tempered, which is firmly held against the end of beam, presenting four marking points.

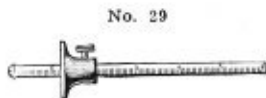


FIG. 2961

5 in. (beam $\frac{1}{2}$ in.) graduated.....	\$1.00
Not graduated.....	.65
6 in. (beam $\frac{3}{8}$ in.) graduated.....	1.25
Not graduated.....	.75

Unless otherwise ordered, we will send those graduated in 64ths.

Two extra cutters will be sent with each gage, fastened to the case.

CARPENTER'S SCRATCH GAGE NO. 429

The head of this gage is made from steel, octagon, case-hardened. Two $\frac{1}{2}$ inch bars, one plain, 4 inches long, and the other graduated in 32ds of an inch, 8 inches long, with sharp rotating cutters on the ends, slide through the head. Either is adjustable in relation to the other, and they may be used to make two marks at once, or by slipping one bar back into the head out of the way, the other may be used for single lines.

The gage is nicely finished. One fastening screw holds both bars or locks them firmly.

Price Each \$1.50

No. 429



FIG. 2962

No. 240

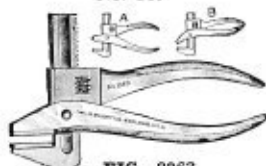


FIG. 2963

EXPANSION PLIERS NO. 240

These pliers will turn any nut, pipe or bolt within their limits and will grip a headless nail, or wire. For working about an automobile or in fact on any machinery having small parts, this tool will be found one of the handiest in the whole kit. It is also useful about the home, and is of great convenience to amateur electricians and mechanics, motorists and cyclists.

No. 240, Plain.....\$2.00 Nickeled.....\$2.25

No. 194



FIG. 2964

No. 191



FIG. 2965

UNIVERSAL SCRAPER NO. 194

Price Each \$1.00
Extra blades..... Each .15
Guards for blade..... Each .15

FLOOR-BENCH AND CABINET SCRAPER NO. 191

Price Each \$1.25
Extra blades..... Each .15

STARRETT'S TOOLS

SURFACE GAGE NO. 52

The sleeve and needle clasp, when loosened for adjustment, are both held by a slight spring friction, and by a single knurled nut both are rigidly clamped. For fine adjustment, the spindle in the base is raised or lowered by a knurled nut, and all backlash is taken up by a spiral spring in the base.

For above 12 inch lengths, an extension is provided to couple on to the spindle.

No. 52A. 8 inch.....	\$2.00
No. 52B. 12 inch.....	2.75
No. 52C. 12 inch, with 6-inch extension.....	3.25
Sleeve alone.....	.75

No. 52



FIG. 2966

No. 53



FIG. 2967

MICROMETER SURFACE GAGE NO. 53

This gage has a turned and polished base, a micrometer adjusting nut reading 1,000ths, and a 6-inch extension for the spindle. By means of springs and taper fitting parts of the sleeve (not shown in cut) the scriber is held by slight friction in any position while adjustments are made, and firmly held by a turn of the nut. A knurled cam on the base releases and locks the spindle for adjusting.

No. 53A. 8 inch, without extension.....	\$2.50
No. 53B. 12 inch, without extension.....	3.50
No. 53C. 12 inch, with 6-inch extension.....	4.00

In ordering, give the size wanted.

SURFACE GAGE ATTACHMENT NO. 54

To be used between the centers of the lathe to adjust, locate and lay out work secured to the face-plate. An auxiliary arbor is supplied size of No. 53 Surface Gage, 12-inch spindle, the sleeve fitting both spindle and arbor.

Those having the Surface Gage will need the arbor only.

Price of Auxiliary Arbor.....\$0.50 Complete.....\$1.50

No. 54



FIG. 2968

No. 56

TOOL MAKERS' UNIVERSAL SURFACE GAGE NO. 56

This gage is adapted for light work. The base is steel, case hardened, with depressions milled in the sides for the thumb and finger to grasp. A V-shaped groove in the end and bottom adapts it for use on cylindrical work. An auxiliary guide piece is furnished to clamp to the base.

No. 56A. Price, with 4 inch spindle and auxiliary guide.....\$3.00

No. 56B. Price, without auxiliary guide.....2.50

Sent with guide unless otherwise ordered.

A 7-inch spindle is furnished when ordered at an extra cost of 25 cents.



FIG. 2969



FIG. 2970

No. 257



FIG. 2971

NEW UNIVERSAL SURFACE GAGE NO. 257

With Case Hardened Steel Base

Special attention is called to the four gage pins in the corners of the base, which adapt it to be used as a locomotive guide liner and make it more convenient than other gages for many uses.

No. 257A. 3 inch base with 9 inch spindle.....	\$3.50
No. 257B. 3 inch base with 9 and 12 inch spindles.....	3.85
No. 257C. 3 1/4 inch base with 12 inch spindle.....	4.00
No. 257D. 3 1/2 inch base with 12 and 18 inch spindles.....	4.50

STARRETT'S TOOLS

TOOL MAKERS' CALIPERS AND DIVIDERS NO. 277

No. 277



FIG. 2972

While nearly everyone is acquainted with the uses of calipers and dividers, it may be stated briefly that in general calipers are used for measuring distances between or over surfaces or for comparing distances or sizes with standards, such as those on graduated rules. Dividers are for measuring distances between points, for transferring distances taken direct from a scale, and for scribing circles or arcs.

To those who are not familiar with the use of calipers, a word of caution may not be out of place. Calipers should never be used on work while it is revolving in a lathe or in any other machine, because if one contact of the caliper is placed against the work the other is likely to be drawn over the work by the friction of the moving surfaces. Only slight force is necessary to spring the legs of a caliper so that measurements taken from moving pieces are never accurate—frequently they are very misleading.

These cuts represent a new line of Calipers and Dividers made from round stock with legs drawn down, making them hard and stiff. The fulcrum stud is hardened, bows extra strong, screw and nut nicely fitted, all finely finished and are the best tools in their line. They are made with solid nut only.

PRICES NO. 277

2 inch.....	Each	\$1.00
3 inch.....	Each	1.25
4 inch.....	Each	1.50
5 inch.....	Each	1.50
6 inch.....	Each	1.75

Packed 2 in a box.

No. 274



FIG. 2973

NO. 274

Inside

2 inch.....	Each	\$1.00
3 inch.....	Each	1.25
4 inch.....	Each	1.50
5 inch.....	Each	1.50
6 inch.....	Each	1.75

Packed 2 in a box.

NO. 275

Outside

2 inch.....	Each	\$1.00
3 inch.....	Each	1.25
4 inch.....	Each	1.50
5 inch.....	Each	1.50
6 inch.....	Each	1.75

No. 275

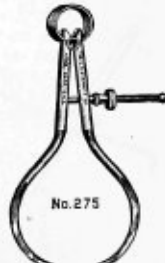


FIG. 2974

DUPLICATE PARTS

TOOLMAKERS' CALIPERS AND DIVIDERS

Screw and ball.....	\$0.15	Spring	\$0.25
Thumb attachment.....	.15	Jam washer.....	.10
Nut	.10	Fulcrum stud.....	.10
Leg	.35		

STARRETT'S TOOLS

THE FAY PATENT SPRING DIVIDERS
WITH SPRING NUT

FIG. 2975

The Fay Calipers and Dividers, Nos. 74 to 77 all sizes, are sent with Spring Nut unless otherwise ordered.

2 1/2 inch, with spring nut, each	\$1 15	With solid nut	\$1 00
3 " " " " " "	1 15	" " " "	1 00
4 " " " " " "	1 40	" " " "	1 25
5 " " " " " "	1 40	" " " "	1 25
6 " " " " " "	1 75	" " " "	1 60
8 " " " " " "	2 00	" " " "	1 85

Spring Nut



FIG. 2976



FIG. 2977

THE FAY PATENT OUTSIDE AND
INSIDE CALIPERS
WITH SPRING NUT

No. 74. Inside. No. 75. Outside.

Prices either style.

2 1/2 inch, solid nut	\$1 00	Spring nut	\$1 15
3 " " " "	1 00	" " " "	1 15
4 " " " "	1 10	" " " "	1 25
5 " " " "	1 10	" " " "	1 25
6 " " " "	1 25	" " " "	1 50
8 " " " "	1 60	" " " "	1 75

Sent with Spring Nut unless otherwise ordered.



FIG. 2978



FIG. 2979

THE FAY PATENT THREAD AND
INSIDE CALIPERS

No. 76. Thread.

3 inch, solid nut	\$1 00	Spring nut	\$1 15
4 " " " "	1 10	" " " "	1 25
5 " " " "	1 10	" " " "	1 25

No. 78. Inside.

4 inch, solid nut	\$1 10
5 " " " "	1 10

No. 78 Inside Calipers are not made to receive the spring nut.

No. 76 sent with spring nut unless otherwise ordered.

YANKEE OUTSIDE AND INSIDE
CALIPERS

No. 73 represents a new Yankee Inside Transfer Caliper with either spring or solid nut. The bow is stiff, making the caliper reliable. After calipering inside of chambered cavity by springing in the legs they may be withdrawn, and as they spring back will show the exact size calipered.

Prices, No. 79 or No. 73.

2 1/2 inch, with solid nut	\$0 65	With spring nut	\$0 80
3 " " " "	70	" " " "	85
4 " " " "	75	" " " "	90
5 " " " "	80	" " " "	95
6 " " " "	85	" " " "	1 00
8 " " " "	1 00	" " " "	1 15
10 " " " "	1 25	" " " "	1 50
12 " " " "	1 50	" " " "	1 65

Sent with solid nut, unless otherwise ordered.



FIG. 2980



FIG. 2981

STARRETT'S TOOLS

NO. 180 CRANK SHAFT CALIPERS

These calipers were designed to use in turning automobile crank shafts and for reaching into difficult places. They are very stiff and nicely finished and can be depended upon for accurate results. Made in one size only.

6 inch, with solid nut.....	Each \$1.00
6 inch, with spring nut.....	Each 1.15

Sent with solid nut unless otherwise ordered.



FIG. 2989

IMPROVED FIRM-JOINT CALIPERS

The improvement in these calipers consists in the construction of the joint, which is so made as to be drawn together by means of a screw.

Their capacity is about one-third greater than the size given.

No. 26 and No. 27

3 inch.....	\$0.40
4 inch.....	.50
5 inch.....	.55
6 inch.....	.65
8 inch.....	.80
10 inch.....	.90
12 inch.....	1.00
14 inch.....	1.50
16 inch.....	1.75
18 inch.....	2.10
20 inch.....	2.50
24 inch.....	3.00
30 inch, No. 26 only.....	5.00
36 inch, No. 26 only.....	6.00

No. 26 not made larger than 24 inch.



FIG. 2990



FIG. 2991

PERFECTED FIRM-JOINT SCREW-ADJUSTING CALIPERS

No. 34 and No. 35

4 inch.....	\$0.90
6 inch.....	1.00
8 inch.....	1.25
10 inch.....	1.50
12 inch.....	1.75
14 inch.....	2.00
16 inch.....	2.25
18 inch.....	2.50
20 inch.....	2.75
24 inch.....	3.50
30 inch, No. 34 only.....	6.00
36 inch, No. 34 only.....	7.00

No. 35 not made larger than 24 inch.



FIG. 2992



FIG. 2993

NO. 44 DOUBLE CALIPERS

These instruments combine dividers, inside and outside calipers. They have improved firm friction joints.

6 inch.....	\$1.25
8 inch.....	1.50

NO. 444 CALIPERS

For Inside and Outside Work

6 inch.....	\$1.25
8 inch.....	1.50

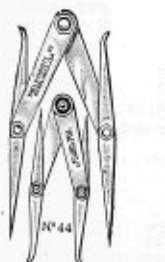


FIG. 2994



FIG. 2995

STARRETT'S TOOLS

No. 41



FIG. 2996

FIRM-JOINT HERMAPHRODITE CALIPERS

Price, No. 41

4 inch.....	\$0.65
6 inch.....	.80
8 inch.....	1.00
10 inch.....	1.20

LOCK-JOINT HERMAPHRODITE CALIPERS

Price, No. 42

4 inch.....	\$1.00
6 inch.....	1.15
8 inch.....	1.35
10 inch.....	1.60

No. 42



FIG. 2997

No. 241



FIG. 2998

HERMAPHRODITE CALIPERS

No. 241. Same as No. 41, except both points are solid.

Price, No. 241

3 inch.....	\$0.40
4 inch.....	.50
5 inch.....	.55
6 inch.....	.65
8 inch.....	.80
10 inch.....	.90
12 inch.....	1.00

No. 242. Same as No. 42, except both points are solid.

4 inch.....	\$0.90
6 inch.....	1.00
8 inch.....	1.25
10 inch.....	1.50

No. 242



FIG. 2999

LOCK-JOINT CALIPERS

Reliable calipers of wide scope for both inside and outside work, that can be instantly adjusted to their full extent, and as quickly locked firm in the joint, and yet provided with a sensitive adjustment.

No. 38 and No. 39

4 inch.....	Price \$0.90	14 inch.....	Price \$2.90
5 inch.....	Price .95	16 inch.....	Price 2.25
6 inch.....	Price 1.00	18 inch.....	Price 2.50
8 inch.....	Price 1.25	20 inch.....	Price 2.75
10 inch.....	Price 1.50	24 inch.....	Price 3.50
12 inch.....	Price 1.75		



FIG. 3000



FIG. 3002

DIVIDERS NO. 43

With improved lock-joint attachment and sensitive adjustment. It is light and stiff, with large capacity, instantly opened, closed and locked.

6 inch.....	\$1.00
8 inch.....	1.25
10 inch.....	1.50



FIG. 3001

STARRETT'S TOOLS

LOCK-JOINT TRANSFER CALIPERS



FIG. 3003

These instruments not only have all the excellent features of Nos. 38 and 39, but in addition to common use may be used inside of chambered cavities, over flanges, etc., removed and replaced without losing the size calipered.

The sizes given refer to the length of the calipers, but the outside ones will caliper a cylinder 20 per cent larger than their length, and the inside calipers will open nearly twice their length.

No. 36 and No. 37

4 inch.....	Price \$1.25	14 inch.....	Price \$2.50
5 inch.....	Price 1.40	16 inch.....	Price 2.75
6 inch.....	Price 1.50	18 inch.....	Price 3.00
8 inch.....	Price 1.75	20 inch.....	Price 3.50
10 inch.....	Price 2.00	24 inch.....	Price 4.25
12 inch.....	Price 2.25		



FIG. 3004

NO. 89. UNIVERSAL DIVIDERS

With the holder turned outward it is possible to work close to shoulders. Turning inward points may be brought close together to scribe the smallest circle.

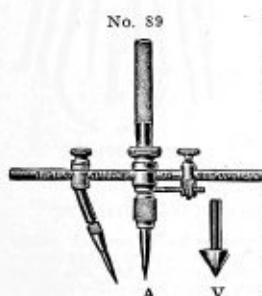


FIG. 3005

With 4 inch beam, $7\frac{1}{2}$ inches and under may be scribed. An auxiliary beam 13 inches long is furnished, with which a 25 inch circle may be drawn.
Tool with 4 inch beam and V center point..\$2.00

List of Extras

	Each
A. Extra Steel Points.....	\$0.10
B. Needle Points.....	.15
C. Pen Attachment.....	1.50
D. Extra Straight Point and Socket.....	.50
E. Extra 13 in. Beam to scribe 25 in. circle	.25
F. Coupling	.35

Total for tool and all attachments\$4.85

Tool and V Center Point, listing at \$2.00, sent unless otherwise ordered.

Extra Parts



FIG. 3006

NO. 92. PATENT DIVIDERS

An Improved Divider With Many Patented Features.

Size	Inches	6	7	8	9
Plain		\$1.10	1.15	1.25	1.35
Nickel		1.35	1.40	1.50	1.60

Sent plain unless otherwise ordered.

NO. 88. BALL POINTS

For Use With Starrett's No. 85 or No. 90 Dividers and No. 51, No. 58 and No. 59 Trammels

This attachment consists of four balls, of $1\frac{1}{8}$ inch, 1 inch, $\frac{3}{4}$ inch and $\frac{1}{2}$ inch diameter respectively, and a holder which fits either divider leg or trammel head. It is used to form a seat for the divider leg in describing circles around a hole.

Complete, 4 balls and holder.....	\$1.25
Either ball or holder.....	.25



FIG. 3007

No. 88



FIG. 3008

STARRETT'S TOOLS



FIG. 3009

IMPROVED EXTENSION DIVIDER NO. 85

The smallest size is 7 inches long; by adjustment of points it becomes 9 inches, and will scribe a 22 inch circle; will caliper 11 inches outside and 12 inches inside. The second size is 9 inches; by adjustment of points it becomes 12 inches, and will scribe a 30 inch circle and caliper 14 inches outside and 16 inches inside. The third size is 12 inches; by adjustment of points it becomes 14 inches, will scribe a 40 inch circle and caliper 17 inches outside and 19 inches inside.

No. 85A.	7 inch, with divider legs only.....	\$1.50
No. 85E.	9 inch, with divider legs only.....	1.75
No. 85C.	7 inch complete.....	2.50
No. 85D.	9 inch complete.....	2.75
No. 85E.	12 inch, with divider legs only.....	2.50
No. 85F.	12 inch complete.....	2.50

No. 85C sent unless otherwise ordered.

IMPROVED BRONZE DIVIDERS NO. 90

The head, with short point, is 8 inches long; may be extended two inches more; will caliper 10 inches outside and 12½ inches inside. With short points it will scribe a 24 inch and with long points a 34 inch circle.

The head and socket legs of this tool are made from drawn (not cast) bronze metal, and are hard, tough, strong, finely finished and nickel plated.

With short points only.....	\$2.25
Set complete.....	4.00

Sent complete unless otherwise ordered.

No. 90



FIG. 3010

FIRM DOUBLE JOINT CALIPERS FOR BLACKSMITHS, NO. 173

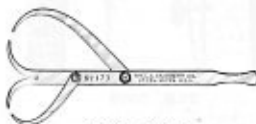


FIG. 3011

These calipers are well made, have perfect joints and a long handle to caliper with comfort hot forgings—the long arm to be used for the greater and the short one for the smaller or finished size. The difference in the length of arms prevents using the wrong caliper when there is but slight variation in the work measured. The caliper is 22 inches in length over all and has a 6-inch caliper on one side and a 12-inch caliper on the other side.

Price Each \$2.00

IMPROVED TRAMMEL POINTS NO. 50

Nickel Plated

Made of bronze metal, with forged steel points, hardened. Either point can be removed, and the pencil socket accompanying each pair put in its place.

Adjustable like spring dividers. Light and durable.

No. 50A.	With 3 inch points, adjustable.....	\$2.50
No. 50B.	With 3 inch points, not adjustable.....	1.50
No. 50C.	Extra long points, 5 in.....	Per set .35

No. 50A sent unless otherwise ordered.

No. 50



FIG. 3012

STARRETT'S TOOLS

EXTENSION BEAM TRAMMELS NO. 51

Nickel Plated

Have opening through the under side to accommodate the extension, giving width and stiffness in proportion to the length required for large work while it is equally well adapted to receive a narrow beam for light work.

No. 51A. Price, complete.....\$2.25

No. 51B. Without caliper legs.....2.50

Sent complete (No. 51A) unless otherwise ordered.
Ball points may be used with this tool.

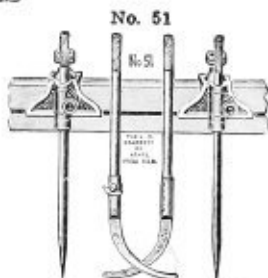


FIG. 3013

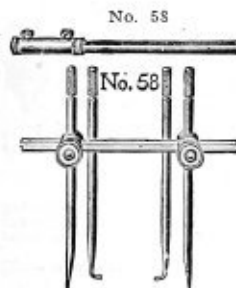


FIG. 3014

EXTENSION STEEL BEAM TRAMMELS NO. 58

The beam of this tool is $\frac{3}{8}$ inch round, with one side flattened. It is made in one, two or three sections, of 14 inch lengths each, and coupled together by means of our improved socket coupling and grip nut, rigidly holding them for long reaches. With one 14 inch section only, it weighs but 8 ounces. The slides carrying the points grip both beam and points by a partial turn of the knurled nut.

	Not Plated	Plated
No. 58A. With one section, 14 inch.....	\$2.20	No. 58D.....\$2.50
No. 58B. With two sections, 28 inch.....	2.60	No. 58E.....3.00
No. 58C. With three sections, 42 inch.....	3.00	No. 58F.....3.50
Extra sections, with coupling.....	.50	
Caliper points to fit this tool, as shown in cut, extra, per pair.....	.50	.60

Those not nicked will be sent unless otherwise ordered.

Ball points may be used with this tool.

When ball points are to be used with No. 58 the fact should be mentioned in the order.

NEW TRAMMELS NO. 59

This cut shows the trammels fastened to a wooden beam, which may be any size from $\frac{3}{4}$ inch to 1 $\frac{1}{2}$ inches wide, and of any thickness desired (requiring no fitting), giving stiffness according to the length and adapting it for small or large work.

The auxiliaries designed to go with the trammel heads are as shown above, viz., inside and outside caliper legs, an extra pair of long points, a set of four ball points with holder, which enable one to scribe a circle from the center of any hole up to 1 $\frac{1}{2}$ inches and under. A lead pencil may be used in place of either of the steel points. The clamping device is adapted to take in either a small or common sized pencil. The trammels are furnished with or without auxiliaries.

The small engraving in the margin gives a more detailed representation of one of the heads.

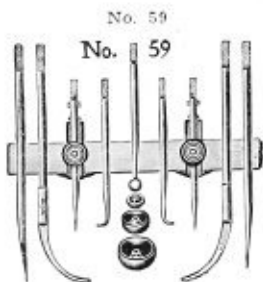


FIG. 3015

PRICES

No. 59A. Trammel Heads (with one pair of points).....	\$2.00
No. 59B. Balls and Holder, per set.....	1.25
No. 59C. Small Caliper Legs.....	Per pair .50
No. 59D. Large Caliper Legs.....	Per pair .75
No. 59E. Large Divider Points.....	Per pair .50
No. 59F. Set complete.....	4.75

Trammel heads with one pair of points (No. 59A) will be sent unless otherwise ordered.

STARRETT'S TOOLS

AUTOMATIC ADJUSTABLE STROKE CENTER PUNCH NO. 18



FIG. 3016

Size AA is 3 3/8 inches long when adjusted for medium stroke, is 5/8 inch in diameter and weighs 1 ounce.

The A size is 5 inches long when adjusted for a medium stroke, 1/2 inch in diameter and weighs 3 ounces.

The B size is 6 inches long when adjusted for a medium stroke, 5/8 inch in diameter and weighs 4 ounces. It differs from the A size in being larger and capable of striking a much heavier blow.

No. 18AA	.....	\$1.50
No. 18A	.....	2.00
No. 18B	.....	2.50
Extra points	.....	Each .15

Unless otherwise ordered, size A will be sent.

MACHINISTS' CENTER PUNCHES

Length of each size 4 inches, Diameter, A, 3/8 inch; B, 1/2 inch; C, 5/8 inch; D, 3/4 inch.



FIG. 3017

A larger size, E, is made for heavy work; length, 5 inches; diameter, 1/2 inch; diameter of knurled part, 1/2 inch.



Sizes A, B, C, D	Per dozen	\$2.00	Each	.....	\$0.20	Per dozen in wooden box	.....	\$2.10
Size E	Per dozen	2.60	Each	.....	.25	Per dozen in wooden box	.....	2.15

Sent in wooden box unless otherwise ordered.

SPACING CENTER PUNCH NO. 118



FIG. 3018

Starrett's Combination Prick Punch and Spacing Tool for laying off work quickly and accurately—for drilling, cutting out dies, etc. The prick punch is solid—made from best tool steel, properly tempered.

Price Each \$0.75

DRIVE PIN PUNCHES
NO. 565

FIG. 3019

Set of eight (one of each size) in round wooden box as shown in cut.....\$1.50



FIG. 3020

Made of good quality steel, neatly shaped, hardened and tempered, with knurled centers.

Length of each size, 4 inches. Diameter of points: A, 1/8 inch; B, 3/8 inch; C, 1/2 inch; D, 5/8 inch; E, 3/4 inch; F, 7/8 inch; G, 1 inch; H, 1 1/8 inch.

Per dozen	.....	\$2.00
Each	.....	.20

Packed one dozen of a size, or one dozen assorted sizes in plain box.

NAIL SETS NO. 116



FIG. 3021

Made of a fine grade of steel, both ends hardened, centers nicely knurled, tips concaved, tops oval, and the size just right.

Length of each size, 4 inches. Diameter at tip: A, 1/8 inch; B, 3/8 inch; C, 1/2 inch; D, 5/8 inch.

Per dozen		\$1.00	Each		\$0.10
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Sent without the wooden box unless otherwise ordered.

EXTRA HEAVY NAIL SETS NO. 176

Per dozen, in wooden box, assorted A, B, and C.....\$1.15

Per
Dozen

No. 176A. 5 in. long, 3/8 in. thick, 3/8 in. at point.....\$1.40

No. 176B. 5 in. long, 1/2 in. thick, 1/2 in. at point.. 1.60



FIG. 3022

STARRETT'S TOOLS

NO. 185 TIME SAVER DRILL, TAP AND STEEL WIRE GAGE

By the use of this gage one is enabled to select at once the right sized drill to suit machine screw tap most commonly used, leaving just stock enough for the tap to cut as near a full thread as is practicable for one tap without breaking it, thus saving much time and uncertainty of result attending the former crude ways of making a selection.



FIG. 3023

Price\$2.00

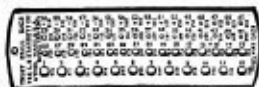


FIG. 3024

NO. 186 DRILL AND STEEL WIRE GAGE

Gives number of drill to fit each hole—and size in thousandths of an inch.

PriceEach \$1.50

NO. 187 JOBBERS' DRILL GAGE

Shows sizes from $\frac{1}{16}$ inch to $\frac{1}{2}$ inch, varying by 64ths. Each size is designated by both common and decimal fraction; gage is hardened and tempered and the holes standard.

PriceEach \$2.25

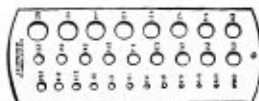


FIG. 3025

NO. 286
TWIST DRILL AND STEEL WIRE GAGE

This gage gives the number of drill to fit each hole. It can also be used in measuring fine drill rods. Each gage is tested after hardening. Size of gage 2 inches long, $\frac{3}{4}$ inch wide and $\frac{1}{8}$ inch thick. It takes in sizes from 61 to 80, inclusive.

PriceEach \$2.00



FIG. 3026

NO. 280 STEEL MUSIC WIRE GAGE

Cut full size.

Washburn & Moen standard.

Each gage carefully tested after hardening.

No. 280 takes in No. 12 to No. 28.

PriceEach \$1.50



FIG. 3027

STARRETT'S TOOLS

NO. 295 MUSIC WIRE GAGE

New American S. & W. Co. Standard

This gage has the decimal equivalent of each number stamped on the back.



FIG. 3028

No. of Wire Gage	Size of Each No. in Decimal Parts of an Inch	No. of Wire Gage	Size of Each No. in Decimal Parts of an Inch	No. of Wire Gage	Size of Each No. in Decimal Parts of an Inch
6-0	.004	8	.020	21	.047
5-6	.005	9	.022	22	.049
4-0	.006	10	.024	23	.051
3-0	.007	11	.026	24	.055
00	.008	12	.029	25	.059
0	.009	13	.031	26	.063
1	.010	14	.033	27	.067
2	.011	15	.035	28	.071
3	.012	16	.037	29	.075
4	.014	17	.039	30	.080
5	.016	18	.041	31	.085
6	.018	19	.043	32	.090
7		20	.045	33	.095

Each gage tested after hardening, and warranted accurate.

No. 295 takes in No. 6-0 to 33. Each \$2.50

NOS. 188 AND 189 ENGLISH STANDARD WIRE GAGES

No. 188 takes in Nos. 1 to 36. Price.....\$2.00

No. 189 takes in Nos. 6 to 36. Price.....1.50



FIG. 3029

NOS. 281 AND 282 AMERICAN STANDARD WIRE GAGES

No. 281 takes in Nos. 0 to 36. Price.....\$2.50

No. 282 takes in Nos. 5 to 36. Price.....\$2.00

The decimal equivalents of each number are stamped on the back.



FIG. 3030



FIG. 3031

NO. 283 UNITED STATES STANDARD WIRE GAGE

This gage takes in sizes from No. 0 to 36. The gage numbers are those of the U. S. Standard Gage for sheet and plate iron and steel, adopted by Congress March 3, 1893.

Size of gage is approximately 3 1/4 inches in diameter by 1/4 inch thick. Each gage is carefully tested after hardening.

No. 283 takes in No. 0 to No. 36. Price.....\$2.50



FIG. 3032

STARRETT'S TOOLS

WASHBURN & MOEN STANDARD WIRE GAGE
NO. 287

This gage takes in sizes from 0 to 36. The gage numbers are those of the Washburn & Moen Standard. Decimal equivalents on the back.

Size of gage approximately $3\frac{1}{4}$ inches diameter by $\frac{1}{4}$ inch thick.

Each gage carefully tested after hardening.

No. 287 takes in sizes from 0 to 36. Price.....\$2.50



FIG. 3033

SIZES AND NUMBERS OF WASHBURN & MOEN STANDARD WIRE GAGE

No. of Wire Gage	Size of Each No. in Decimal Parts of an Inch	No. of Wire Gage	Size of Each No. in Decimal Parts of an Inch	No. of Wire Gage	Size of Each No. in Decimal Parts of an Inch
0000	.3938	11	.1205	24	.0230
000	.3625	12	.1055	25	.0204
00	.3310	13	.0915	26	.0181
0	.3065	14	.0800	27	.0173
1	.2830	15	.0720	28	.0162
2	.2625	16	.0625	29	.0150
3	.2437	17	.0540	30	.0140
4	.2253	18	.0475	31	.0132
5	.2070	19	.0410	32	.0128
6	.1920	20	.0348	33	.0118
7	.1770	21	.03175	34	.0104
8	.1620	22	.0286	35	.0095
9	.1483	23	.0258	36	.0090
10	.1350				

STARRETT WIRE GAGE GUIDE NO. 288



FIG. 3034

The time saver and mistake eliminator for all workmen using a wire gage on duplicate work. The gage is held on the central stud, and may be securely locked in any position, so that all but the required number will be covered, thus making mistakes impossible, and saving the time formerly used in hunting for the size. Very handy when gaging material in poorly lighted warehouses and shops.

Size A made to be used with English Standard Wire Gage No. 189 and American Standard Wire Gage No. 282.

Size B made to be used with English Standard Wire Gage No. 188 and American Standard Wire Gage No. 281, United States Standard Wire Gage No. 283 and Washburn & Moen Standard Wire Gage No. 287, also imperial Standard Gage No. 442.

Price Each \$0.65

STANLEY METALLIC PLUMBS AND LEVELS

WITH GROOVED BOTTOMS FOR SHAFTING, ETC.

NO. 34-V ECLIPSE LEVELS



N°34-V

FIG. 3035

ECLIPSE LEVELS have a glass fitted in a metal case. An outer shell termed by us "Eclipse Cover," is fitted over this case, which can be turned so as to completely protect the Glass. The case is screwed to a substantial metal base. The levels may be adjusted by these screws. For leveling up shafting, piping, etc., they are made with "V" bottoms.

No. 34-V—6 in. Long Nickel-plated Ground Glass.....per doz., \$18.00
 No. 34-V—8 in. Long Nickel-plated Ground Glass.....per doz., 24.00

NO. 36-G PLUMBS AND LEVELS

End View



FIG. 3036

STANLEY METALLIC PLUMBS AND LEVELS No. 36 have tops and bottoms milled and wet ground to insure two perfectly parallel surfaces. The glasses are so set that either surface may be used to level or plumb. They are set in metal cases which fit accurately on supports cast in the frame of the level. The cases are held on the supports by means of eccentric cone centers at each end, with screw adjustment.

To adjust the glasses, slacken the screws, insert paper between the case and the support that will bring the bubble to the proper position, tighten the screw and the glass is held firmly in place.

These levels are made with a grooved bottom for working on shafting, piping, etc.

No. 36G—12 in. Long Japanned Nickel Trim Proved Glasses....per doz., \$21.00

No. 36G—24 in. Long Japanned Nickel Trim Proved Glasses....per doz., 27.00

NO. 37-G PLUMBS AND LEVELS

End View

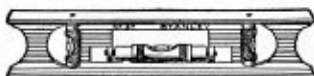


FIG. 3037

STANLEY METALLIC PLUMBS AND LEVELS No. 37 are of the same general design as the No. 36—the tops and bottoms milled and wet ground parallel, the glasses being similarly set and adjusted, as explained above. These levels, however, have ground glasses, are full nickel-plated, and the glasses are protected. This latter feature consists of a shell or cover, termed by us "Eclipse Case." When the level is not in use this case can be turned so as to completely protect the glass from damage.

These Levels are made with a grooved bottom for working on shafting, piping, etc.

No. 37-G—12 in. Long Nickel-plated Ground Glasses.....per doz., \$36.00
 No. 37-G—18 in. Long Nickel-plated Ground Glasses.....per doz., 42.00
 No. 37-G—24 in. Long Nickel-plated Ground Glasses.....per doz., 48.00

STARRETT'S TOOLS

NO. 134. CROSS-TEST LEVEL AND PLUMB

NICKEL-PLATED

This is a well made and reliable tool, and valuable in plumbing, squaring and leveling up work. Just the thing to use about a planer or in setting up machinery. Leveling is indicated every way without moving the tool.

It weighs three ounces. Size, 2-inch x 3-inch x $\frac{1}{2}$ inch thick. Can be easily carried in the pocket.

Price..... each, \$1.50



FIG. 3052

NO. 136. CROSS-TEST LEVEL

As the cut shows, two levels are united in one frame, extending at right angles $2\frac{1}{4}$ inches each way. The level weighs but four ounces. When placed on work to be leveled in both directions, it will not be necessary to move the tool.

Price..... each, \$0.75



FIG. 3053

NO. 101. LEVELING INSTRUMENT

Designed for the use of architects, contractors, carpenters, millwrights, masons, surveyors, etc.

No. 101A. Japanned, nicked tube.....each, \$12.50

No. 101B. Japanned, nicked tube with ground vial in level.....each, 14.00

No. 101A will be sent when style is not specified.

NO. 99. TRANSIT

This instrument consists of a tripod, to the head of which is connected an upper plate carrying a graduated arc and a level with plain sight tube.

It is designed for architects, carpenters, and contractors to lay out building sites and determine the levels; for masons and wheelwrights in the construction of foundations and the setting of water wheels; building of dams and raceways. The farmer will find it convenient to ascertain the amount of fall for the location of drains, or to find the height of springs; and when the bearing of lines is not required, the surveyor will find this superior to the ordinary needle compass, for angles may be taken where, from local attraction, it would not be possible to set them off with the needle.

No. 99A. With plain sight tube and short legs each, \$15.00

No. 99B. " " " " " long " 17.00

No. 99C. " " " " " short legs, and

ground level vial.....each, 16.50

No. 99D. With plain sight tube and long legs and

ground level vial.....each, 18.50

No. 99E. With telescope, short legs, and ground

level vial.....each, 31.00

No. 99F. With telescope, long legs, and ground

level vial.....each, 33.00

Targets to go on common ten-foot pole, extra \$1.50

No. 99F will be sent when style is not specified.



FIG. 3054



FIG. 3055

NO. 100. TWIN GAS HEATER

The heater will be found very useful in the machine shop as it is convenient for tempering small tools, melting lead, Babbitt etc., and as a forge for light work it will be found very valuable. Plumbers, tinsmiths, electricians, jewelers, dentists, barbers and others will also find it valuable. For laboratory and household use it has no equal. Over it a quart of water will boil in six minutes.

No. 100A. Burner only without base.....each, \$0.75

No. 100B. One burner with base....." 1.00

No. 100C. Two burners " " " 2.00

No. 100D. Three " " " 3.00

No. 100E. Tool holder only....." .15

No. 100F. Dish holder....." .25

No. 100G. Ladle only, 14 in. long, 12 oz. in wt. " .25

No. 100H. One burner with base (B) with tool holder

(E) and dish holder (F).....1.40

Unless otherwise ordered No. 100H will be sent.



FIG. 3056

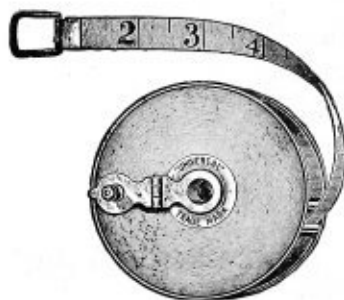


FIG. 3057

Tape $\frac{3}{4}$ inch wide, made of best woven linen with metallic warp. Hard leather cases, brass folding handles and brass trimmings.

Length.	Marked one side only. 12ths.	Price per dozen	Marked both sides, 12ths & Links.	Marked both sides, 10ths & Links.	Price per doz.
25 ft.	No. 500	\$20 40	No. 500 L	No. 500 DL	\$21 60
33 "	" 501	24 00	" 501 L	" 501 DL	25 20
40 "	" 502	26 40	" 502 L	" 502 DL	27 60
50 "	" 503	30 00	" 503 L	" 503 DL	31 20
65 "	" 504	33 60	" 504 L	" 504 DL	35 00
75 "	" 505	37 20	" 505 L	" 505 DL	39 60
100 "	" 506	46 80	" 506 L	" 506 DL	50 40

Tapes marked in meters and centimeters on back instead of links, price same as tapes marked both sides.

Tapes marked in feet on back instead of links, price same as tapes marked both sides.

Marked in Meters and Centimeters, one side only.

No.	501 M	503 M	504 M	505½ M	506 M
Length, meters.	10	15	20	25	30
Price, per dozen,	\$24 00	\$30 00	\$33 00	\$40 80	\$46 80

METALLIC TAPES ONLY, WITHOUT CASES.

Length, feet,	25	33	40	50	65	75	100
Marked one side, per doz.,	39 60	\$12 00	\$14 40	\$16 80	\$19 20	\$21 60	\$31 20
" both sides, "	10 80	13 20	15 60	18 00	21 60	24 00	34 80
Length, meters,	10	15	20	25	30	30	30
Marked one side, per doz.,	\$12 00	\$16 80	\$19 20	\$25 00	\$31 20	\$31 20	\$31 20

"RELIABLE JUNIOR" STEEL MEASURING TAPES.

With double folding flush handle, opened by pressing small pin or button, on opposite side. Hard leather cases. Nickel plated trimmings. Measurements guaranteed perfectly accurate.

WITH $\frac{1}{4}$ -INCH TAPES.

Marked feet and 12ths (inches and sixteenths.)	Marked feet 10ths and 100ths of foot, for Surveyors' use.	Length.	Diameter of Case.	Per Dozen.
No. 100	No. 100 D	25 feet.	2¼ inches	\$45 00
" 101	" 101 D	33 "	2½ "	48 00
" 103	" 103 D	50 "	2¾ "	55 00
" 104	" 104 D	66 "	3 "	63 00

Tapes marked metric measure, one side only, at same price.
Tapes marked feet one side, metric measure on the other add 2 cents per foot to list price.

A convenient Vest Pocket Steel Tape; 25 ft. weighs only 3 ounces; 50 ft. only 5 ounces complete and the other sizes in proportion.

"Reliable Jr." Tapes only, without cases 25 ft., per doz. \$27.00; 33 ft., per doz. \$30.00; 50 ft., per doz. \$35.00; 66 ft., per doz. \$42.00.

MEASURING TAPES.

ASS SKIN MEASURING TAPES.

With $\frac{1}{2}$ -inch Cotton Tape.

Brass bound cases brass folding handles and trimmings.

No.	710	711	712	713	714	715	716
Length, ft.,	25	33	40	50	65	75	100
Per doz.,	\$3 75	\$4 00	\$4 50	\$5 00	\$5 00	\$7 50	\$9 00

METALLIC MEASURING TAPES.

FOLDING HANDLE.

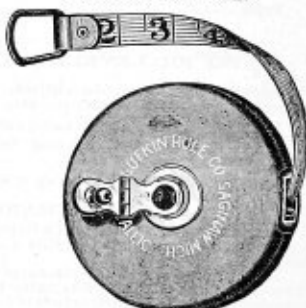


FIG. 3058

No.	505½ M	506 M
Length, meters.	25	30
Price, per dozen,	\$40 80	\$46 80

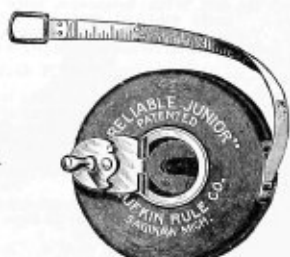


FIG. 3059

MEASURING TAPES—CONTINUED.

POCKET LINEN TAPES.

With handsome and durable round edge nickel plated brass cases, spring wind, center stop.

With 1/4-inch Enameled Linen Tape.

No. 173.	36 inches, marked inches and 8ths.	Per dozen	\$3 50
No. 175.	60 " " " " " " " "	"	4 50
No. 176.	72 " " " " " " " "	"	5 00
No. 173M.	36 " 1 meter, in. and 8ths and millimeters.	Per doz.	4 50
No. 175M.	60 " 1 1/2 " " " " " " " "	"	6 00
No. 176M.	72 " 2 " " " " " " " " "	"	7 00

With 5-16-inch Enameled Linen Tape.

No. 188.	96 inches, marked inches and 8ths.	Per dozen	\$8 50
No. 188F.	8 feet, marked feet,	"	8 50

FIG. 3060

POCKET STEEL TAPES.

Nickel Plated Brass Cases, Spring Wind, with Center Stop.

Marked one side only.

No. 143.	36 inches, 1/4-inch Tape, marked inches and 16ths.	Per doz.	\$ 7 00
No. 145.	60 " " " " " " " "	"	9 00
No. 146.	72 " " " " " " " "	"	10 00
No. 148.	96 " " " " " " " "	"	14 00
No. 148F.	8 feet, 1/4-inch Tape, marked feet, inches and 16ths.	"	14 00
With Metric Measure. Inches and 16ths One Side, Millimeters Other Side.			
No. 143M.	36 inches, 1 meter, 1/4-inch Tape.	Per doz.	\$ 8 00
No. 145M.	60 " 1 1/2 " " " " " " "	"	10 00
No. 146M.	72 " 2 " " " " " " "	"	12 00
No. 148M.	96 " 2 1/2 " " " " " " "	"	16 00

FIG. 3061

"CHALLENGE" STEEL MEASURING TAPES.

Hard leather cases, nickel plated trimmings, flush handle, 3/8-inch tape marked one side only, in 10ths or 12ths.

Marked Feet and 12ths (Ins. and 8ths).	Marked Feet, 10ths and 100ths of Ft. for Surveyors' use	Length	Diam. of Case.	Dozen.
No. 260	No. 260 D	25 ft.	2 1/4 in.	\$39 00
" 261	" 261 D	33 "	2 3/4 "	42 00
" 263	" 263 D	50 "	3 1/4 "	48 00
" 264	" 264 D	65 "	3 3/4 "	60 00
" 265	" 265 D	75 "	4 1/4 "	63 00
" 266	" 266 D	100 "	4 3/4 "	81 00

Marked inches one side, metric measure other side, add 2 cents per foot to list price.

Marked in Meters and Centimeters.

One Side Only. Millimeters the first 10 Centimeters.	No.	261M	263M	264M	265 1/2 M	266M
Length, meters.		10	15	20	25	30
Price, per dozen.		\$42 00	\$48 00	\$60 00	\$72 00	\$81 00

FIG. 3062

"RIVAL" STEEL MEASURING TAPES.

Nickel plated steel cases, flush handle, 3/8-inch tapes, marked one side only in 10ths or 12ths.

Marked Feet and 12ths (Ins. and 8ths).	Marked Feet, 10ths and 100ths of Ft. for Surveyor's use	Length	Diam. of Case.	Dozen.
No. 240	No. 240 D	25 ft.	2 1/4 in.	\$33 00
" 241	" 241 D	33 "	2 3/4 "	36 00
" 243	" 243 D	50 "	3 1/4 "	40 80
" 244	" 244 D	66 "	3 3/4 "	51 00
" 245	" 245 D	75 "	3 3/4 "	54 00
" 246	" 246 D	100 "	4 1/4 "	69 00

Marked inches one side, metric measure other side, add 2 cents per foot to list price.

Marked in Meters and Centimeters.

One Side Only. Millimeters the first 10 Centimeters.	No.	241M	243M	244M	245 1/2 M	246M
Length, meters.		10	15	20	25	30
Price, per dozen.		\$36 00	\$40 80	\$51 00	\$61 20	\$69 00

FIG. 3063



FIG. 3064

STARRETT POCKET STEEL TAPES

No. 500. These tapes are $\frac{1}{4}$ inch wide, in well finished nickel plated cases, with rounded edges. Spring wind with center stop. Graduated in inches and sixteenths of an inch.

Length, feet	3	5	6	8	10
No. 500, each . . .	\$0.60	.75	.80	1.15	1.50

STARRETT STEEL MEASURING TAPES

IN STEEL CASES WITH PUSH BUTTON

These tapes are $\frac{3}{8}$ inch wide, in strong and well finished nickel plated steel cases, with flush handle and push button on opposite side, a slight pressure of which will instantly release the handle.

No. 505. Graduated in feet, inches and eighths of an inch.

Length, feet	25	33	50	66	75	100
Price, each	\$2.75	3.00	3.40	4.25	4.50	5.75



FIG. 3065

STARRETT STEEL MEASURING TAPES
IN LEATHER CASES WITH PUSH BUTTON

No. 512

No. 510



FIG. 3066

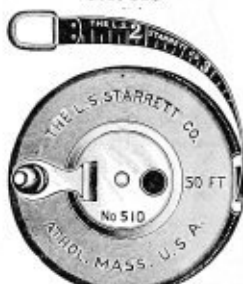


FIG. 3067

No. 512. Graduated in feet, inches and sixteenths of an inch.

These tapes are $\frac{1}{4}$ inch wide, in hard leather cases, with flush handle and push button on the opposite side, a slight pressure of which will instantly release the handle. Trimmings nickel plated.

Length, feet	25	33	50	66	75
Price, each	\$3.00	3.25	3.50	4.00	4.50

No. 510. Graduated in feet, inches and eighths of an inch.

These tapes are $\frac{3}{8}$ inch wide, in hard leather cases, with flush handle and push button on opposite side, a slight pressure of which will instantly release the handle. Trimmings nickel plated.

Length, feet	25	33	50	66	75	100
Price, each	\$3.25	3.50	4.00	5.00	5.25	6.75

**"STARRETT" REEL MEASURING TAPES
NO. 537 AND NO. 538**



FIG. 3068

With $\frac{3}{8}$ inch tape. Frame nickeled with rosewood handle. Folding winding handle.

No. 537. Graduated in feet, inches and eighths of an inch.

No. 538. Graduated in feet, tenths and hundredths of a foot.

Length, feet	25	33	50	66	75	100
Price, each	\$3.00	3.50	4.50	5.25	6.25	7.75

**"STARRETT" SURVEYORS' CHAIN TAPES
NO. 528 AND NO. 529**



FIG. 3069

With $\frac{1}{4}$ inch heavy steel tape. Frame nickeled with rosewood handle. Folding winding handle. Two detachable rings sent with each tape. Tape may be readily detached from reel and used with a ring at each end.

These tapes are graduated on one side only in feet or links and poles. Tapes graduated in feet have first foot graduated in tenths or twelfths.

Unless otherwise ordered, those in tenths will be sent.

The graduations are etched on the tape, not put on with rivets which weaken the tape or with soft metal which wears off. The graduations and figures will never wear out on these tapes.

No. 528. 150 links, each	\$6.00
No. 529. 100 feet, each	6.00
Tape only, with rings	4.00

POLISHED STEEL SQUARES

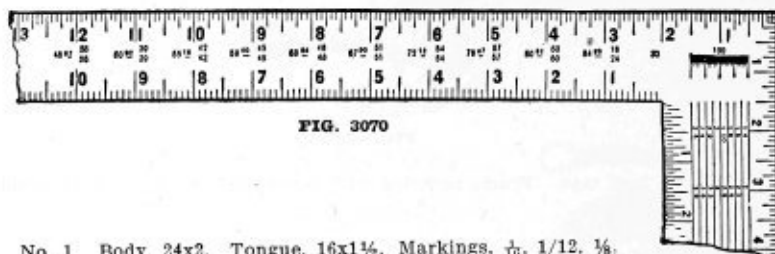


FIG. 3070

No. 1. Body, 24x2. Tongue, 16x1½. Markings, 1/16, 1/12, 1/8, 1/4, 1/100. Kind of measure, Brace, Essex's Board and 8 Square.
Per dozen\$20.00

No. 3. Body, 24x2. Tongue, 16x1½. Markings, 1/16, 1/12, 1/4. Kind of measure, Brace, Essex's Board.
Per dozen\$19.00

No. 14. Body, 24x2. Tongue, 16x1½. Markings, 1/8, 1/4. Kind of measure, Essex's Board.
Per dozen\$17.00

No. 100. Body, 24x2. Tongue, 16x1½. Markings, 1/16, 1/8, 1/12, 1/10, 1/4, 1/100. Kind of measure, Brace, Essex's Board and 8 Square.
Per dozen\$21.00

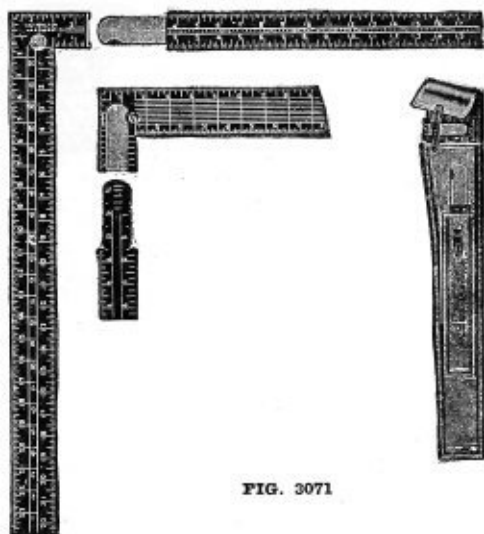
Packed ¼ dozen in a box; weight about 29 pounds to the dozen; 18-inch tongues furnished on Nos. 3, 4 and 100 if desired.

EXTRAS FOR SPECIAL FINISHES

The following Squares can be furnished in the finishes given.

We carry in stock the Blued White Enameled Markings only.

Same Figures and Markings as	Galvanized	Blued White Enameled Markings	Add to Price of Polished Per Dozen	Same Figures and Markings as	Galvanized	Blued White Enameled Markings	Add to Price of Polished Per Dozen
No.	No.	No.	Net	No.	No.	No.	Net
1	G1	B1	\$5.50	14	G14	B14	5.50
3	G3	B3	5.50	100	G100	B100	5.50



THE STANDARD
SOUTHINGTON
TAKE DOWN
SQUARE

T. D. NO. 101

FIG. 3071

The Standard Take Down Square is made with a Solid Heel. The Tongue fits easily and accurately and is instantly locked by a Slotted Cam. A coin answers as a screw driver.

This Locking Device, together with the design of the Tongue and Socket, secures the maximum of strength and accuracy.

No springs to fail or lose. All surfaces are flush and graduations match.

Packed one complete Square in a waterproof scabbard as shown. Weight, $2\frac{1}{2}$

Made in various finishes as follows:
pounds each.

Prices No. T. D. 101

Polished, per dozen.....	\$42.00
Gun Metal, per dozen.....	52.00

We can furnish Galvanized Finish to order. Packed 4 dozen in a case. Gross weight, 165 pounds per case.

INSTRUCTIONS

In putting this square together, insert tongue in the slot, being sure to push straight and see that tongue IS SEATED HOME.

The tongue is now ready to be locked and on this point we wish to emphasize the fact that the CAM MUST ALWAYS BE LEFT IN POSITION (LOCKED).

Square is now ready for use and you may be sure that it is mechanically perfect and CANNOT SLIP OR DROP OUT.

When through using square, turn arrow or cam to open. This releases the lock, leaving tongue ready to take apart.

If for any reason the square should hold or bind, DO NOT USE FORCE, but raise the body a few inches and let drop on bench or square timber. This will jar the tongue part way out.

Then take the square in hands and give a straight, steady pull apart. This will release the tongue and it is now ready to pack in scabbard.

NEVER USE A HAMMER ON THIS SQUARE.

Keep the joint clean and free from dust or rust. Use a little vaseline as a lubricant.

BOARD AND LOG RULES.

BOARD RULES *

Per Doz.

- No. 1—Square Head, 3 tier, $3\frac{1}{2}$ -foot rule, $1\frac{1}{4}$ inches wide, extra heavy brazed head, steel caps and brass shoulders, measure 12 to 22 feet....\$27 00
- No. 2—Square Head, 3-foot rule, otherwise same as No. 1..... 25 00
- No. 3—Square Head, 3-foot rule, with short brass shoulder, otherwise same as No. 1..... 23 00
- No. 8—Square Head, 4 tier, 3-foot rule, $1\frac{1}{4}$ inches wide, otherwise same as No. 1..... 25 00
- No. 2—Diamond Head, 3 tier, 3-foot rule, otherwise same as No. 1..... 25 00
- No. 8—Diamond Head, 4 tier, 3-foot rule, $1\frac{1}{4}$ inches wide, measures 9 to 16 feet, otherwise same as No. 1..... 25 00



FIG. 3072



FIG. 3073

LOG RULES.†

Per Doz.

- No. 14—Square Head, figured 48 inches, 4-foot rule.....\$27 00
- No. 16—Solid Hook, figured 48 inches, 4-foot rule..... 27 00

* N. B.—Full length of rules given above, including six-inch handle. We furnish rules for any measurements required, also left hand rules when ordered.

For all special rules ordered an extra price will be charged.

† N. B.—Made with any scale desired; Doyle, Scribner, Decimat, and combined Doyle-Scribner are regular, all other scales are special. Regular rules are marked to scale from 8 to 20 feet or 12 to 24 feet logs, every two feet.

For all special rules an extra price will be charged.



FIG. 3074

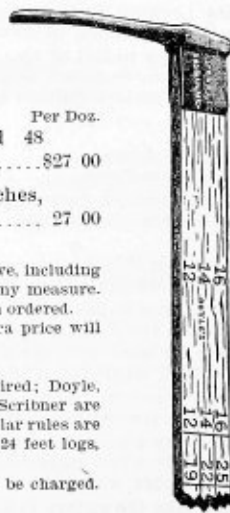


FIG. 3075

STANLEY BOXWOOD RULES
TWO FOOT, FOUR FOLD, UNBOUND



FIG. 3077

No. 68. 1 inch wide, Round Joint, Middle Plates, 8ths and 16th. Per doz.....\$2.50



FIG. 3078

No. 70. 1 3/8 inch wide, Square Joint, Middle Plates, 8ths and 16ths. Per doz...\$4.00

TWO FOOT, FOUR FOLD, BOUND



FIG. 3079

No. 62 1/2. 3/4 inch wide, Square Joint, Bound, 8ths, 12ths and 16ths. Per doz...\$3.00

ONE FOOT, FOUR FOLD, UNBOUND

No. 65



FIG. 3080

No. 65. 5/8 inch wide, Square Joint, Middle Plates, 8ths and 16ths. Per doz. 2.00

ONE FOOT, FOUR FOLD, BOUND



FIG. 3081

No. 65 1/2. 5/8 inch wide, Square Joint, Full Bound, 8ths and 16ths. Per doz...\$5.50

STANLEY BOXWOOD CALIPER RULES

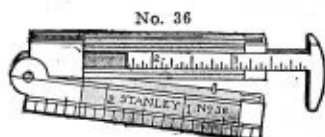


FIG. 3083



FIG. 3084

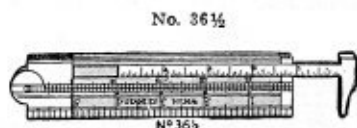


FIG. 3085

SIX INCH, TWO FOLD RULES

No. 36. Square Joint, $\frac{7}{8}$ inch wide, 8ths, 10ths, 12ths and 16ths. Per dozen. \$4.50

ONE FOOT, TWO FOLD

No. 36½. Square Joint, 1 inch wide, 8ths, 10ths, 12ths and 16ths. Per dozen. \$6.50

ONE FOOT, FOUR FOLD

No. 32. Arch Joint, Edge Plates, 1 inch wide, 8ths, 10ths, 12ths and 16ths.

Per dozen 7.00

LUFKIN FOLDING STEEL RULES



FIG. 3086

Patent Stop Joints. Made of tempered steel, $\frac{3}{4}$ inch wide. Figures Sunken. Marked both sides.

No. 1176. 6 feet, marked inches and 16ths. Per dozen.....\$50.40

STANLEY "ZIG ZAG" RULES



FIG. 3087

SIX INCH FOLD, CONCEALED JOINT, YELLOW ENAMEL FINISH

Number	02	03	04	05	06	08
Length	2	3	4	5	6	8
List	per dozen \$2.20	3.30	4.40	5.50	6.60	8.80

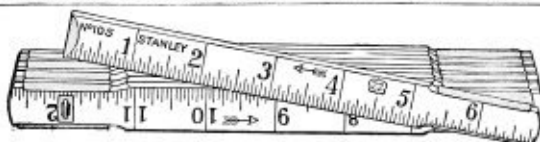


FIG. 3088

SIX INCH FOLD, CONCEALED JOINT WHITE ENAMEL FINISH

Number	102	103	104	105	106	108
Length	2	3	4	5	6	8
List	per dozen \$2.40	3.60	4.80	6.00	7.20	9.60

VICTOR "ZIG ZAG" RULES



FIG. 3089

SIX INCH FOLD, RIVET JOINT, YELLOW ENAMEL FINISH

Number	802	803	804	805	806	808
Length	2	3	4	5	6	8
List	per dozen \$1.80	2.70	3.60	4.50	5.40	7.20

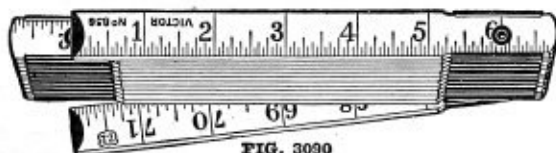


FIG. 3090

SIX INCH FOLD, RIVET JOINT, WHITE ENAMEL FINISH

Number	852	853	854	855	856	858
Length	2	3	4	5	6	8
List	per dozen \$2.04	3.00	3.96	4.92	6.00	7.92

MARKING GAGES

No. 61



FIG. 3091

No. 61. Marking, beechwood, boxwood thumb screw, oval bar, marked, steel point.

List priceper dozen \$0.96

No. 62. Pat. Marking, beechwood, polished, boxwood thumb screw, oval bar, marked, adjusting steel point.

List priceper dozen \$1.80

No. 64½



FIG. 3092

No. 64½. Pat. Marking, polished, oval plated head, brass thumb screw and shoe, oval bar, marked adjusting steel point.

List priceper dozen \$3.60

No. 77



FIG. 3093

No. 77 Pat. Mortise and Marking, rosewood, plated head, improved screw slide, brass thumb screw and shoe, oval bar, marked, steel points.

List priceper dozen \$7.20

IMPROVED BUTT GAGE

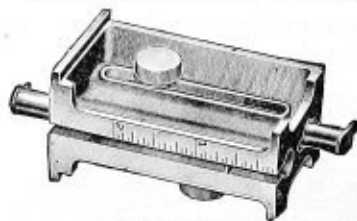


FIG. 3094

A Metallic Butt Gage, having one bar with two steel cutters fixed upon it. When the cutter at the outer end of this bar is set for gaging on the edge of the door, the cutter at the inner end of the bar is already set for gaging from the back of the jamb. The other bar has a steel cutter to accurately gage for the thickness of the butt. Packed one in a box.

List priceper dozen \$9.00

STANLEY'S PLUMBS AND LEVELS

No. 0. Non-adjustable, Hardwood



FIG. 3098

No. 3. Adjustable, Hardwood



FIG. 3099

No. 30. Duplex Adjustable, Hardwood

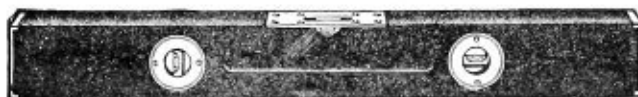


FIG. 3100

No. 45. Mason's, Soft Wood



FIG. 3101

No. 13. Victor Adjustable, Hardwood



FIG. 3102

No.	Description	Length, Inches	Package Contains	Wgt. per Pkg., Lbs.	Price, per Dozen
00	Non-adjustable	18 to 22	1/2 doz.	16 1/2	\$ 8.40
0	Non-adjustable	24 to 30	1/2 doz.	20	9.60
3	Adjustable, brass tips	24 to 30	1/2 doz.	22	15.00
5	Adjustable, brass tips, brass tips	24 to 30	1/2 doz.	24	19.80
30	Duplex adjustable, brass tips	24 to 30	1/2 doz.	24	18.00
45	Mason's, 1 3/8 x 4 1/16 inch stock, brass tips	48	1/2 doz.	40	36.00
13	Brass tips	24 to 30	1 only	3 1/4	18.00

PROVED LEVEL GLASSES



FIG. 3105

Made of extra thick tubing. By a patented process, each Level Glass is marked at its highest, or crowning point, by two indelible lines. The owner can thus easily set the glass accurately in its proper position.

Inches	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	3	3 1/2	4	4 1/2	Assorted
Per gross	\$9.48	9.60	9.72	9.84	10.00	10.25	10.50	11.50	13.00	14.50	16.00	12.00



FIG. 3106

BIT AND
SQUARE LEVEL

FIG. 3107

The frame of this Level has three pairs of V slots on its back edges. The shank to a bit will lie in these slots, either parallel with the bubble glass, at an exact angle to it, or at an angle of 45 degrees.

A thumb-screw secures the Level to the bit, in either position; and boring can be done with perfect accuracy as to perpendicular, horizontal or angle of 45 degrees, by observing the bubble-glass while turning the bit.

The frame can also be attached to a carpenter's square. Two shoulders rest on the top of the horizontal leg to the square, thus making it an accurate spirit level. The upright leg of the square will indicate an exact plumb line.

No. 44. Bit and Square Level, brass frame, one in a box per doz., \$3.60

LEVEL SIGHTS

By the use of these ingenious devices which can be attached to any Level, the owner has a convenient and accurate means for leveling, from one given point to another at a long distance away. When not in use the Level Sights are easily detached, and can be packed away in a small space for future use.

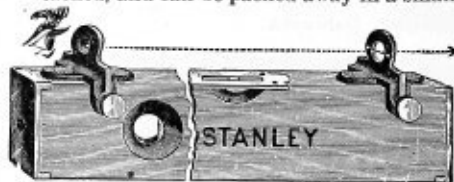


FIG. 3108



FIG. 3109



FIG. 3110

No. 1. Improved Level Sights, for wood levels, per pair, in a box per doz. pr., \$9.00



FIG. 3111



FIG. 3112



FIG. 3113

No. 2. Improved Level Sights, for iron levels, in a box per pair, \$9.00

STANLEY PLANES

"BAILEY" ADJUSTABLE IRON PLANES
WITH SMOOTH OR CORRUGATED BOTTOMS

No. 4



FIG. 3114

No. 6



FIG. 3115

No. 1		Smooth	5½-in. long,	1½-in. Cutter	Each,	\$1.50
No. 2		Smooth	7 -in. long,	1½-in. Cutter	Each,	2.00
No. 3		Smooth	8 -in. long,	1½-in. Cutter	Each,	2.10
No. 4	or 4 C	Smooth	9 -in. long,	2 -in. Cutter	Each,	2.20
No. 4½		Smooth	10 -in. long,	2½-in. Cutter	Each,	2.50
No. 5	or 5 C	Jack	14 -in. long,	2 -in. Cutter	Each,	2.50
No. 5½		Jack	15 -in. long,	2½-in. Cutter	Each,	3.00
No. 6	or 6 C	Fore	18 -in. long,	2½-in. Cutter	Each,	3.25
No. 7	or 7 C	Jointer	22 -in. long,	2½-in. Cutter	Each,	3.75
No. 8		Jointer	24 -in. long,	2½-in. Cutter	Each,	4.50

The "C" after the number indicates corrugated bottoms.

"BAILEY" WOOD PLANES

No. 27



FIG. 3116

Every carpenter needs two or more wood planes in his kit, for rough outside work.

"Bailey" Wood Planes supply the demand for a wood plane of superior quality. The bottom, handle, and knob are made from selected and well seasoned beech. The cutters are the regular "Bailey" type and are adjustable both endwise and sidewise.

No. 23 Smooth	9 inches in length,	1¾-inch cutter	Each,	\$1.50
No. 27 Jack	15 inches in length,	2½-inch cutter	Each,	1.90
No. 29 Fore	20 inches in length,	2½-inch cutter	Each,	4.10
No. 31 Jointer	24 inches in length,	2½-inch cutter	Each,	2.25
No. 33 Jointer	30 inches in length,	2½-inch cutter	Each,	2.45

STANLEY IRON BLOCK PLANES

No. 220 Adjustable, 7½ inches in length, 1½-inch cutter each, \$0.75



FIG. 3117

STANLEY ADJUSTABLE
BEADING, RABBET
AND MATCHING PLANE

This Plane embraces (1) Beading and Center Beading Plane; (2) Rabbet and Filletster; (3) Dado; (4) Plow; (5) Matching Plane; (6) Sash Plane; and (7) a superior Slitting Plane.

Each Plane has seven Beading Tools (1, 2, 3, 4, 5, 6, 7), ten Plow and Dado Bits (1, 2, 3, 4, 5, 6, 7, 8, 9, 10), ½, ¾, 1, 1½, 2, 2½, 3, 4, 5, 6, 7, 8, 9, 10 inch), a Slitting Blade, a Tonguing Tool and a Sash Tool.

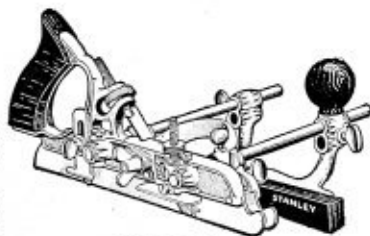


FIG. 3118

No. 45 Nickel-plated, with 21 cutters	each,	\$ 7.00
No. 55 Universal Plane, with 52 cutters	each,	14.00

STEARNS FLOOR SCRAPER



FIG. 3119

NO. 10 FLOOR SCRAPER

With Adjustable Cross Handle

This Scraper is intended for use on large surfaces. The knife, which is 6 inches wide, scrapes the floor when the machine is drawn towards the operator, and will, therefore, in connection with the adjustable cross handle which may be placed to one side or the other, work up to the wall and into the corners. In using this Scraper see that screw in the top of the cap is adjusted so it will strike level on the knife. After once getting this screw in the proper place leave it there, and in removing the knife for sharpening always use the screw where the slot is. The knife is firmly clamped in the Scraper, which, together with the weight of the machine, nearly all of which rests on the knife, prevents vibration or chatter, doing away with all wavy effects on the floor. The 5 inch wheels have rubber tires which do not mar the floor.

Finished in aluminum. Length of handle and braces $33\frac{1}{2}$ inches.

List priceeach \$26.00

Packed one in a box. Shipping weight 135 pounds.

JAPANNED PLUMB BOBS

STAPLE TOP

No. 1. Weight 9 ounces each.....list, per dozen \$1.35

Cut is half size.

Packed one dozen in a box.



FIG. 3120



FIG. 3121

ADJUSTED TOP

No. 00. Weight 1 lb. 2 oz. each...list, per dozen \$2.70

No. 0. Weight 2 lbs. 10 oz. each...list per dozen 5.80

Cut shows the No. 00, and is half size of No. 0.

Packed: No. 0 are loose; No. 00, half dozen in a box.

BRASS PLUMB BOBS

CAST BRASS FILLED, STEEL POINTED,
SCREW TOP

No. 5. Weight 6 ounces each....list, per dozen \$ 7.25

No. 6. Weight 11½ ounces each....list, per dozen 10.00

No. 8. Weight, 16 ounces each....list, per dozen 11.40

Cut shows Nos. 5 and 8, and is half size No. 6.

Packed half dozen in a box.



FIG. 3122

STEARNS ACCURATE STEEL PLUMB BOBS



FIG. 3123

Turned from round cold rolled steel. Guaranteed to be accurate. Have brass cap. Both nickel plated and brass parts are highly polished. Points are hardened.

No. 50. Weight, each, 4½ ounces.....list, per dozen \$ 7.25

No. 60. Weight, each, 9½ ounces.....list, per dozen 10.00

No. 80. Weight, each, 18 ounces.....list, per dozen 11.40

THE JORGENSEN HAND SCREW

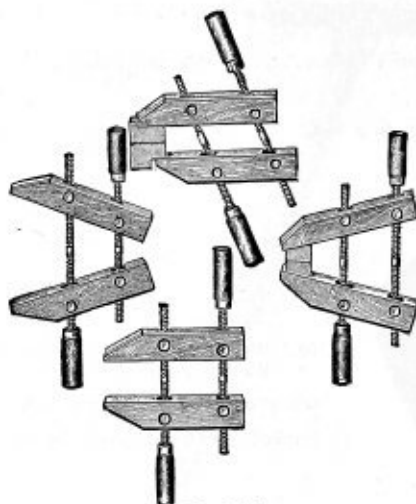


FIG. 3124

The Jorgensen Hand Screw is well and popularly known, having been on the market for years.

It has cold rolled steel spindles with right and left hand threads passing through steel shafts inserted in maple jaws. All friction between the spindles and the jaws is removed by slotted holes and those parts cannot become cramped.

One hand screw will adjust to any of the positions illustrated or any modification of them, works perfectly in any of them, and will not slip or draw the work even when making a wet glue joint.

On ordinary straight work it operates much quicker as both jaws travel on its right and left thread, has a tighter grip and is indestructible.

There are repeated demands for this tool by those using it. It eclipses in every way the wooden hand screw now in use, and because of its speed and long life is by far the most economical.

No.	Length of Jaws, In.	Opening Between Jaws, Inches	Price, Doz.	No.	Length of Jaws, In.	Opening Between Jaws, Inches	Price, Doz.
0	8	4	\$13.20	3	14	10	\$19.20
1	10	6	15.60	4	16	12	22.80
2	12	8	17.40	5	18	14	26.40

WOOD HAND SCREWS

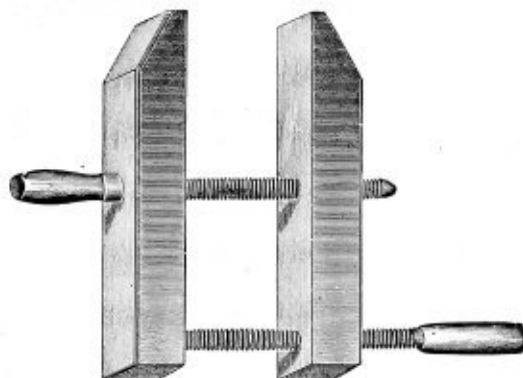


FIG. 3125

Nos.	Diameter of Screws, Inches	Whole Length of Screws, Inches	Whole Length of Jaws, Inches	Size of Jaws, Inches	Open, Inches	List Price Per Dozen
800	1 1/4	28	24	3 x 3	17	\$40.00
801	1 1/4	26	22	2 3/4 x 2 3/4	15 1/2	35.00
802	1 1/4	24	20	2 5/8 x 2 5/8	13 3/4	32.00
803	1 1/4	22	20	2 1/2 x 2 1/2	12	30.00
804	1 1/8	22	18	2 1/2 x 2 1/2	12 1/4	28.50
805	1 1/8	20	18	2 3/8 x 2 3/8	10 1/2	27.00
806	1	20	16	2 1/8 x 2 1/8	11	25.00
807	1	18	16	2 1/8 x 2 1/8	9 1/4	23.50
808	7/8	18	14	2 1/8 x 2 1/8	10	22.00
809	7/8	16	14	2 x 2	8 1/4	20.00
810	7/8	16	12	1 7/8 x 1 7/8	8 1/2	18.50
811	3/4	14	12	1 3/4 x 1 3/4	7 1/2	17.00
812	3/4	12	10	1 5/8 x 1 5/8	5 1/2	14.50
813	5/8	10	8	1 3/8 x 1 3/8	4 1/2	12.00
814	5/8	8	7	1 1/8 x 1 1/8	3	9.50
815	3/8	6	5	1 x 1	2	8.00
816	3/8	5	4	7/8 x 7/8	1 1/4	7.00

Either Screw or Jaw, One-third the Price of the complete Hand Screw.

HICKORY BENCH SCREWS



FIG. 3126

No. 16.	2 3/4-inch Hickory Screw.	per doz.,	\$11.00
" 17.	2 3/8 "	" "	9.00
" 18.	2 "	" "	6.50
" 19.	1 3/4 "	" "	6.00
" 20.	1 1/2 "	" "	5.50
" 21.	1 1/4 "	" "	4.50

Stearns ECCENTRIC CLAMPS

Style "A"

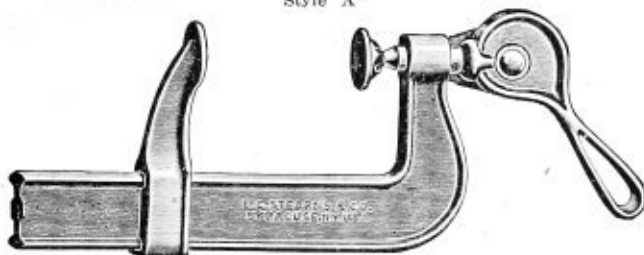


FIG. 3130

These Clamps are made of the best quality refined air furnace malleable iron. They are strongly constructed and adjust themselves to beveled surfaces.

LIST PRICES

No.	Opening, Inch	Per Dozen	No.	Opening, Inch	Per Dozen
0	2 $\frac{1}{4}$	\$3.60	3	8	8.40
1	4	4.80	4	12	10.20
2	6	6.60			

Packed one-half dozen in a box.

Stearns STEEL BAR ECCENTRIC CLAMPS

Style "B." $1\frac{1}{2} \times \frac{5}{16}$ -Inch Steel Bar

FIG. 3131

This Clamp is designed and constructed to stand much greater strains than any other Eccentric Clamp in the market.

The steel bar is of "I" shaped steel of extreme stiffness. It is stiffer, thicker and wider than others. The sliding jaw moves easily and smoothly, and by an automatic acting enclosed spiral spring is firmly held in place at any desired point on the bar.

All parts except the bar are malleable iron.

Distance from bar to center of bearing on plunger and on sliding jaw, two inches.

LIST PRICES

No.	Inch	Per Dozen	No.	Inch	Per Dozen	No.	Inch	Per Dozen
6	10	\$10.00	12	30	\$16.20	18	66	\$27.00
7	12	10.80	13	36	18.00	19	72	28.80
8	15	11.70	14	42	19.80	20	78	30.60
9	18	12.60	15	48	21.60	21	84	32.40
10	21	13.50	16	54	23.40	22	90	34.20
11	24	14.40	17	60	25.20	23	96	36.00

Packed in crates.

SPECIAL NEW ADJUSTABLE CLAMP



FIG. 3132

It is especially useful in all wide clamping, such as sash, doors, blinds, etc.

WITH 1½ AND ¼-INCH BAR

No.	412	413	414	415	416	417	418	419
Opens .....feet	2	2½	3	3½	4	4½	5	6
Weight, per pair.....pounds	14	15½	17	18½	20	21½	22½	25
Price .....per pair	\$3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.50

WITH 1¼ AND ⅜-INCH BAR

No.	420	421	422	423	424	425	426	427
Opens .....feet	3	4	5	6	7	8	9	10
Weight, per pair.....pounds	30½	35	39½	44	49	52½	57½	62½
Price .....per pair	\$6.00	6.50	7.50	8.50	9.50	11.00	12.50	14.00

SPECIAL PERFECTION CLAMP



FIG. 3133

WITH 1½ AND ¼-INCH BAR

No.	438	439	440	441	442	443	444	445
Opens .....feet	2	2½	3	3½	4	4½	5	6
Weight, per pair.....pounds	12½	14	15½	16¾	18	19½	20¼	22½
Price .....per pair	\$3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.50

WITH 1¼ AND ⅜-INCH BAR

No.	446	447	448	449	450	451	452	453
Opens, .....feet	3	4	5	6	7	8	9	10
Weight, per pair.....pounds	26½	31	35½	40	45	50	55	60
Price .....per pair	\$6.00	6.50	7.50	8.50	9.50	11.00	12.50	14.00

SPECIAL JOINERS' CLAMP



FIG. 3134

Our Joiner Clamp is intended for gluing and clamping where speed and rapidity of handling is more necessary than power.

No.	458	459	460	461	462
Opens .....feet	1	1½	2	2½	3
Weight, per pair.....pounds	6	6¾	7¼	8	8¾
Price .....per pair	\$2.70	2.85	3.00	3.15	3.30

CHISELS AND GOUGES

SOCKET FIRMER CHISELS, NO. 11



Beveled back; Leather Capped handles.
Length of blade, 6 to 7 inches.

FIG. 3135

Width .....inches	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/4	1 1/2	1 3/4	2
Per dozen	\$14.00				15.50	16.00	18.00	18.50	20.50	22.00	24.00	25.00

Can also be furnished in plain back or with plain handles.

SOCKET FIRMER BUTT CHISELS, NO. 71



Beveled back; Leather Capped handles.
Length of blade, 2 1/2 inches.

FIG. 3136

Sizes and prices same as No. 11 Chisel above.

SOCKET CABINET CHISELS, NO. 111



Length of blade, 3 1/2 inches.

Sizes and prices, same as No. 11 Chisel above.

FIG. 3137

SOCKET FRAMING CHISELS, NO. 2



Oval back; Steel Ring handles.
Length of blade, 8 inches.

FIG. 3138

Width .....inches	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/4	1 1/2	1 3/4	2
Per dozen	\$9.00	9.50	10.00	10.50	11.00	12.00	12.00	13.00	14.50	16.00	

SOCKET FIRMER GOUGE, NO. 131



Leather Capped handles. Furnished regularly in outside bevel. Inside bevel if specified. Length of blade, 6 inches.

FIG. 3139

Width ....inches	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/4	1 1/2	1 3/4	2
Per dozen	\$10.50	11.00	11.50	12.25	13.25	14.00	15.50	17.25	18.75	21.25		

TANG FIRMER CHISELS, NO. 23



Beveled back; Leather Capped handles.

Length of blade, 4 1/2 inches.

FIG. 3140

Width .....inches	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/4	1 1/2	1 3/4	2
Per dozen	\$6.40	6.40	6.70	7.10	7.60	8.20	9.50	11.00	12.75	15.00		

Packed regularly in wooden boxes, 1/2 dozen each.

Can be furnished in sets in both plain and fancy boxes.

TANGED BUTT CHISELS, NO. 93



Length of blade, 2 1/2 inches.

List and sizes, same as No. 23 above.

FIG. 3141

CHISELS AND GOUGES

TANG GOUGES, NO. 133

Length of blade, $4\frac{1}{2}$ to $5\frac{1}{2}$ inches.

FIG. 3142

Width	inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2
Per dozen		\$7.70	7.70	8.10	8.60	9.30	10.00	11.75	13.75	16.00	19.00		

TANG TURNING CHISELS, NO. 73



Length of blade, 7 inches.

FIG. 3143

Width	inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2
Per dozen		\$6.00	6.00	6.50	7.00	7.75	9.00	10.75	13.25	16.00	18.50		

TANG TURNING GOUGES, NO. 113



Length of blade, 7 inches.

FIG. 3144

Width	inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2
Per dozen		\$7.50	7.50	8.00	9.25	10.50	11.50	14.50	18.50	21.75	26.25		

HICKORY CHISEL HANDLES

Nos. 119, 120, 121

Nos. 1 and 2



FIG. 3145

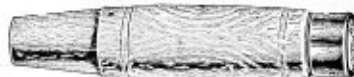


FIG. 3146

SOCKET FIRMER CHISEL HANDLES

Leather Capped

No. 119.	Assorted, 5 sizes, for chisels,	$\frac{1}{8}$ to 2 inches.....	per gross	\$8.25
No. 120.	Assorted, 3 sizes, for chisels,	$\frac{1}{8}$ to $1\frac{1}{2}$ inches.....	per gross	8.00
No. 121.	Assorted, 2 sizes, for chisels,	$1\frac{1}{4}$ to 2 inches.....	per gross	8.50

SOCKET FRAMING CHISEL HANDLES

Steel Ringed

No. 1.	Assorted, 4 sizes, for chisels,	$\frac{1}{4}$ to 2 inches.....	per gross	\$5.50
No. 2.	Assorted, 2 sizes, for chisels,	$1\frac{1}{4}$ to 2 inches.....	per gross	6.00

TANG FIRMER CHISEL HANDLE



FIG. 3147

No. 10. Assorted, 5 sizes, for chisels,
 $\frac{1}{8}$ to 2 inch.....per gross \$5.00No. 11. Assorted, Large, 3 sizes,
for chisels, 1 to 2 inch
.....per gross 5.25

No. 110. Assorted, same as No. 10 but with Leather Heads.....per gross 12.00

No. 111. Assorted, same as No. 11 but with Leather Heads.....per gross 12.25

Packed in boxes of one dozen each.

PEXTO DRAWING KNIVES—GUARANTEED

No. 15



FIG. 3143

NO. 15 RAZOR BLADE

Have crucible steel blades laid deep into Norway Iron. Nickel plated caps and ferrules. Highly polished, strong and well balanced.

Size	8	9	10	12	16
List, per doz. ..	\$13.50	14.40	15.60	18.00	24.00

No. 10



FIG. 3149

NO. 10 FOLDING HANDLE

Blades made same as Razor Blade. When adjusted, the handles are as rigid as the straight handle draw shave. Made so as to take up any wear from adjusting, and will not work loose after using.

Size	8	9	10
List....per doz.	\$28.00	29.00	30.50

No. 6



FIG. 3150

NO. 6 CARRIAGE MAKERS

Although these knives have a very narrow blade for fine work, they are forged and tempered so carefully they will stand up under hard usage.

Size	8	9	10
List....per doz.	\$12.00	13.00	14.00

No. 17



FIG. 3151

NO. 17 EXTRA HEAVY SHINGLE SHAVES

Extra heavy knives, with big broad blades. For use by linemen, and for the heavier class of work.

Size	8	10	12	14
List...per doz.	\$14.40	18.00	21.60	25.20

No. 4



FIG. 3152

NO. 4 PONY

Especially adapted for manual training work. A handy little knife which should be in every household for shaving doors, etc. Blade is 4 inches long by $\frac{3}{4}$ inch wide. Length over all, $10\frac{1}{4}$ inches.

List.....per doz.	\$5.00
-------------------	--------

STEARNS BENCH STOPS

NO. 10 BENCH STOP

Quickly adjustable and reversible.

Head is of solid steel. It is readily attached by boring a $\frac{3}{8}$ inch hole through the top of the bench.

List price....per dozen \$9.00



FIG. 3153

No. 15



FIG. 3154

NO. 15 BENCH STOP

Reversible, and may be adjusted to any desired height by turning the adjusting screw.

Per dozen\$5.00

Packed one-half dozen in a box.

Twelve dozen in case.

STEARNS ADJUSTABLE HOLLOW AUGER

NO. 0



FIG. 3155

The jaws may be adjusted to any size from $\frac{1}{4}$ to $1\frac{1}{4}$ inches, to the scale upon head of tool. They are hardened steel, and are secured by screws working in the slots at side of cutter head. The adjustable stop and graduated scale upon the body regulate the length of tenon.

List priceper dozen \$48.00

STEARNS ADJUSTABLE HOLLOW AUGER

NOS. 3 AND 30

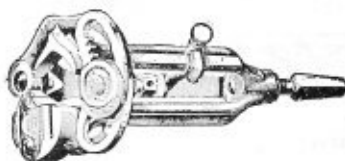


FIG. 3156

No. 3—Cut any size tenon from $\frac{1}{4}$ to $1\frac{1}{4}$ inches.

No. 30—Cut any size tenon from $\frac{1}{4}$ to $1\frac{1}{2}$ inches.

The pivoted jaws are provided with a graduated scale by which the size of the tenon is regulated. To secure required length of tenon a movable stop is operated upon a graduated scale with rulings to sixteenths. These Hollow Augers are made from the same design, except that the No. 30 is larger and heavier in every way.

List price, No. 3per dozen \$60.00

List price, No. 30per dozen 72.00

AJAX BORING MACHINES

"Ajax Special"

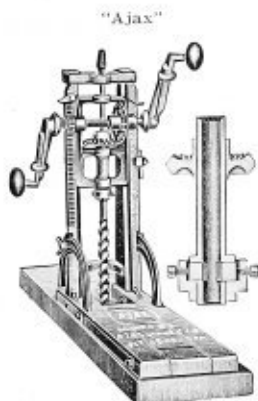


FIG. 3157

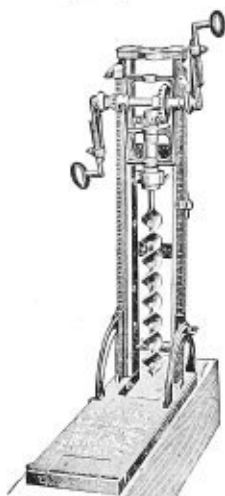


FIG. 3158

AJAX SELF-WITHDRAWING WOOD BORING MACHINE

The Ajax Self-Withdrawing Wood Boring Machine is equipped with new improved chuck that will hold wood boring machine augers, nut augers, square shank augers, etc. Practically any round or square shank auger can be used in this machine. Machine will bore upright or at an angle, and bores to 9 inches in depth. Adjustable handles. List price.....each \$6.50

AJAX SPECIAL WOOD BORING MACHINE

The Ajax Special Boring Machine is similar in design to the Ajax Boring Machine, except that it will bore up to 20 inches in one continuous operation. It is designed for heavy timbers on bridge and trestle construction. The new improved chuck will hold round or square shank augers, power machine bits, etc. List price\$12.50

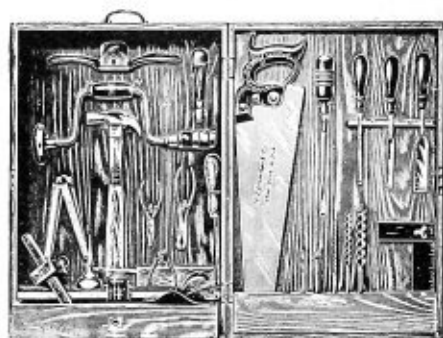


FIG. 3159

TOOL CABINETS NO. 100 COMPLETE

Contents, 26 articles, as follows:

- | | | |
|-----------------------------|--|--------------------------|
| 1 18 inch Saw. | 1 Drawing Knife (instead of Spokeshave). | 1 Brace. |
| 3 Auger Bits. | 1 Plane. | 1 pair Gas Pliers. |
| 3 Chisels. | 1 Rule. | 1 pair Flat Nose Pliers. |
| 1 Screw Driver. | 1 Try Square. | 1 pair Cutting Nippers. |
| 1 Countersink. | 1 Marking Gage. | 1 Saw File. |
| 1 Gimlet Bit. | 1 Nail Set. | 1 Oil Whetstone. |
| 1 Steel Nail Hammer. | 1 can Glue. | 1 Oiler. |
| 1 Toolholder with 10 Tools. | | |

No. 100. Complete as above. Weight about 20 pounds. Price.....each \$24.00

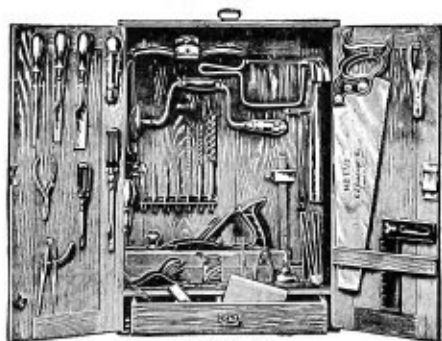


FIG. 3160

NO. 101 COMPLETE

Made of chestnut, paneled and nicely finished.

Contents, 36 articles, as follows:

- | | | |
|-----------------------|--|--------------------------|
| 1 18 inch Saw. | 1 Tack Hammer. | 1 Pair Wing Dividers. |
| 1 Brace, No. 108. | 1 Toolholder with 10 Tools. | 1 pair Gas Pliers. |
| 3 Gimlet Bits. | 1 Drawing Knife (instead of Spokeshave). | 1 pair Flat Nose Pliers. |
| 3 Auger Bits. | 1 Level. | 1 pair Cutting Nippers. |
| 3 Chisels. | 2 Planes. | 1 Saw File. |
| 1 Coping Saw. | 1 Rule. | 1 Oil Whetstone. |
| 1 Hack Saw, No. 408. | 1 Try Square. | 1 Oiler. |
| 1 Countersink. | 1 Marking Gage. | 1 can Glue. |
| 1 A1 Cabinet Scraper. | 1 Cup Point Nail Set. | 2 Screw Drivers. |
| 1 Steel Nail Hammer. | | |

No. 101. Complete as above. Weight about 35 pounds. Price.....each \$35.00

TOOL CABINETS NO. 102



FIG. 3161

"A place for everything and everything in its place."

Outside dimensions, $29 \times 24 \frac{7}{8} \times 8 \frac{1}{8}$ inches.

Made of chestnut, paneled and nicely finished.

Contents, 46 articles, as follows:

- | | | |
|--|--------------------------|---------------------------------------|
| 1 Ratchet Brace, No. 108 $\frac{1}{2}$. | | 1 Square Reamer, No. 6 |
| 2 Saws (1 Rip and 1 Cross Cut). | | 1 Screw Driver Bit. |
| 3 Chisels. | | 1 Level. |
| 3 Gimlet Bits. | | 2 Screw Drivers. |
| 7 Auger Bits | | 1 Compass Saw, No. 25 $\frac{1}{2}$. |
| 1 Countersink, No. 002. | | 1 A1 Cabinet Scraper. |
| 1 Square Reamer, No. 6. | | 1 Hack Saw. |
| 1 Coping Saw. | 2 Planes. | 1 pair Wing Dividers. |
| 1 Steel Nail Hammer. | 1 Oiler. | 1 pair Gas Pliers. |
| 1 Tack Hammer. | 1 can Glue. | 1 pair Flat Nose Pliers. |
| 1 Steel Hatchet. | 1 Drawing Knife (instead | 1 pair Cutting Nippers. |
| 1 Toolholder with 10 Tools. | of Spokeshave). | 2 Files. |
| 1 Try Square. | 1 Marking Gage. | 1 Oil Whetstone. |
| 1 Cup Point Nail Set. | 1 Rule. | |

Every Tool Warranted.

Complete with Tools, etc. Weight about 48 pounds. Price.....each \$50.00

EMPTY "MODEL" TOOL CHESTS

Nos. 240 and 250

Strongly made of selected chestnut, filled and varnished. Each chest has lock and tray or trays as specified below.

Nos. 200 to 230



FIG. 3162



FIG. 3163

No. 200.	15x 6½x5	in., movable tray.	Weight 5½	lbs.	Price...each	\$4.00
No. 210.	16x 7½x5½	in., movable tray.	Weight 6	lbs.	Price...each	4.50
No. 220.	18x 8½x6½	in., movable tray.	Weight 10	lbs.	Price...each	5.00
No. 230.	20x 9½x7½	in., movable tray.	Weight 12	lbs.	Price...each	5.50
No. 240.	22x10½x8½	in., two sliding trays.	Weight 15	lbs.	Price...each	6.00
No. 250.	25x12½x9½	in., two sliding trays.	Weight 20	lbs.	Price...each	7.00



FIG. 3164

Outside measurement, 24½x12½x9¾ inches.

Contents, 30 tools, as follows:

1 Saw (18 inch).	1 Try Square.	1 Scratch Awl.
1 Brace.	1 Marking Gage.	1 Mitre Box.
3 Bits.	2 Chisels (forged steel).	1 Screw Driver (forged).
1 Mallet.	1 File.	1 Rule (2 foot)
1 Block Plane.	1 Hatchet.	10 Tools in Toolholder.
1 Smooth Plane.	1 Steel Hammer.	1 pair Pliers.

Every Tool in This Chest Is Fully Warranted.

No. 17. Complete with Tools. Weight about 29 pounds. Price.....each \$20.00

TOOL CHEST NO. 18

COMPLETE WITH TOOLS

This Chest is made of Selected Chestnut, nicely varnished. Each Chest has a lock and key and two sliding trays.

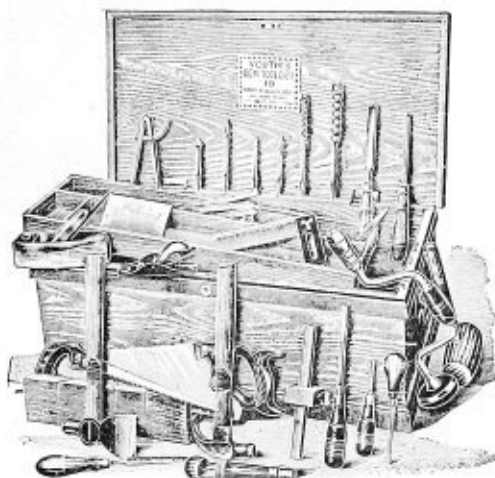


FIG. 3165

Outside Measurements: $28\frac{1}{2} \times 14\frac{1}{2} \times 10\frac{3}{4}$ Inches.

Contents: 36 Tools, as Follows:

1 Saw (18 inch)	1 Compass Saw (best grade)	1 Mitre Box
1 Brace	2 Chisels (forged steel)	1 Knurled Nail Set
4 Bits	1 Countersink	1 Screw Driver, 2-inch (forged)
1 Mallet	1 Pair Wing Dividers	1 Screw Driver, 5-inch (forged)
1 Block Plane	1 File	1 Rule (2 foot)
1 Smooth Plane (double iron)	1 Steel Hammer	1 Tool holder containing 10 tools
1 Try Square	1 Steel Hatchet	1 Cabinet Scraper
1 Marking Gage	1 Scratch Awl	

Every Tool in This Chest Is Fully Warranted.

No. 18. Complete with Tools.....each \$25.00

Weight, about $30\frac{1}{2}$ lbs. each. Four in crate, about 150 lbs.

NATIONAL STEEL TOOL CHESTS

For gas fitters, plumbers, iron workers, expressmen, etc.

Made of steel with wrought iron corners and hardwood braces. Will last a lifetime.

Style A Single Drawer



FIG. 3160

Style B Double Drawer



FIG. 3167

STYLE A AND B CHESTS

No. (either style)	10	20	30	40	50	60
Depth	11	14	16	19	20	24
Width	12	15	17	20	22	24
Length	24	30	36	42	48	48
Style A—Price	\$18.50	25.00	28.00	32.00	36.00	40.00
Style A—Weight, each	60	70	115	150	175	195
Style B—Price	\$21.00	27.00	29.50	33.00	38.50	41.50
Style B—Weight, each	70	80	125	160	190	215

Style C



FIG. 3168

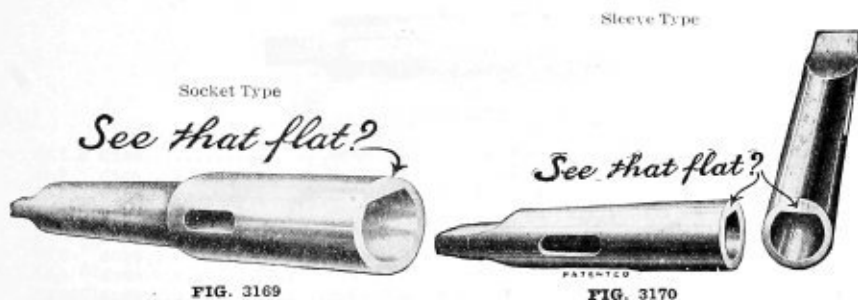
STYLE C CHESTS

No. 1.	11 inches deep, 12 inches wide, 30 inches long,	65 pounds.....	\$18.50
No. 2.	11 inches deep, 12 inches wide, 36 inches long,	75 pounds.....	22.00
No. 3.	11 inches deep, 12 inches wide, 42 inches long,	94 pounds.....	25.00
No. 4.	11 inches deep, 12 inches wide, 48 inches long,	106 pounds.....	29.00
No. 5.	11 inches deep, 12 inches wide, 54 inches long,	116 pounds.....	36.00
No. 6.	11 inches deep, 12 inches wide, 60 inches long,	126 pounds.....	36.00
No. 7.	11 inches deep, 12 inches wide, 66 inches long,	136 pounds.....	39.00
No. 8.	11 inches deep, 12 inches wide, 72 inches long,	139 pounds.....	43.00

NOTE—If the above style chests are ordered with two drawers, add \$2.00 to list price.

All chests over 42 inches long have handles on four sides.

"USE-EM-UP" DRILL SOCKETS



SOCKET TYPE

Number	1-2	1-3	1-4	1-5	2-3	2-4	2-5	3-2	3-3
Hole	1	1	1	1	2	2	2	3	3
Shank fitted to socket..	2	3	4	5	3	4	5	2	3
Price	\$2.00	2.50	3.20	4.80	2.50	3.20	4.80	3.20	3.20

Number	3-4	3-5	4-3	4-4	4-5	4-6	5-4	5-5	5-6
Hole	3	3	4	4	4	4	5	5	5
Shank fitted to socket..	4	5	2	4	5	6	4	5	6
Price	\$3.20	4.80	4.80	4.80	4.80	12.00	12.00	12.00	12.00

SLEEVE TYPE

Number	1-2	1-3	1-4	1-5	2-3	2-4
Hole	1	1	1	1	2	2
Fitted to socket.....	2	3	4	5	3	4
Price	\$1.80	2.40	3.00	4.40	2.40	3.00

Number	2-5	3-4	3-5	4-5	4-6	5-6
Hole	2	3	3	4	4	5
Fitted to socket.....	5	4	5	5	6	6
Price	\$4.40	3.00	4.40	4.40	10.00	10.00

"Use-Em-Up" drill sockets are intended for using up twist drills or reamers having broken shanks or twisted tangs.

These sockets will drive a drill where only three-quarters of an inch of the shank remains. All that is necessary is to grind a flat surface on the remaining shank of the drill or reamer and put it to work.

"Use-Em-Up" sockets have now come into general use and the majority of big concerns drive all their drills with them. All drill companies will furnish drills flattened for "Use-Em-Up" sockets at no extra charge.

TAPER DRILL SLEEVES NO. 121 FOR TAPER SHANK DRILLS



FIG. 3171

No. 201	has No. 1 Hole, outside fitting No. 2 Socket.....	each	\$ 1.80
No. 201A	has No. 1 Hole, outside fitting No. 3 Socket.....	each	2.40
No. 201B	has No. 1 Hole, outside fitting No. 4 Socket.....	each	3.00
No. 202	has No. 2 Hole, outside fitting No. 3 Socket.....	each	2.40
No. 202A	has No. 2 Hole, outside fitting No. 4 Socket.....	each	3.00
No. 203	has No. 3 Hole, outside fitting No. 4 Socket.....	each	3.00
No. 204	has No. 4 Hole, outside fitting No. 5 Socket.....	each	4.40
No. 205	has No. 5 Hole, outside fitting No. 6 Socket.....	each	10.00

EXTENSION DRILL SOCKETS NO. 120 FOR TAPER SHANK DRILLS



FIG. 3172

No. 101	has No. 1 Hole and No. 2 Shank.....	each	\$ 2.00
No. 101A	has No. 1 Hole and No. 3 Shank.....	each	2.50
No. 102	has No. 2 Hole and No. 3 Shank.....	each	2.50
No. 102A	has No. 2 Hole and No. 4 Shank.....	each	3.20
No. 103	has No. 3 Hole and No. 4 Shank.....	each	3.20
No. 104	has No. 4 Hole and No. 5 Shank.....	each	4.80
No. 105	has No. 5 Hole and No. 6 Shank.....	each	12.00

STEEL SOCKETS NO. 122 FOR TAPER SHANK DRILLS



FIG. 3173

No. 301	No. 1, holds $\frac{1}{4}$ to $\frac{3}{8}$ inches, inclusive, entire length, 7 inches; diameter of blank end, $1\frac{1}{8}$ inches.....	each	\$ 1.20
No. 302	No. 2, holds $\frac{5}{16}$ to $\frac{1}{2}$ inches, inclusive, entire length, 8 inches; diameter of blank end, $1\frac{1}{4}$ inches.....	each	1.80
No. 303	No. 3, holds $\frac{3}{8}$ to $1\frac{1}{4}$ inches, inclusive, entire length, 10 inches; diameter of blank end, $1\frac{1}{2}$ inches.....	each	2.50
No. 304	No. 4, holds $1\frac{3}{8}$ to 2 inches, inclusive, entire length, 13 inches; diameter of blank end, 2 inches.....	each	4.00
No. 305	No. 5, holds $2\frac{1}{8}$ to 3 inches, inclusive, entire length, 15 inches; diameter of blank end, $2\frac{1}{2}$ inches.....	each	7.50
No. 306	No. 6, holds $3\frac{1}{8}$ to 4 inches, inclusive, entire length, 18 inches; diameter of blank end, 3 inches.....	each	14.00

DRILL SLEEVES **FOR BLACKSMITHS' OR STRAIGHT SHANK DRILLS**

**FIG. 3174**

No. 0	Sleeve for 1/2-inch Round Shank Drills.....	\$1.25
No. 00	Sleeve for 5/8-inch Round Shank Drills.....	1.25
No. 01	Sleeve for 1/2-inch Round Shank Drills.....	1.50
No. 001	Sleeve for 5/8-inch Round Shank Drills.....	1.50

The Shank of No. 0 or 00 is No. 1 Standard Square Taper.

The Shank of No. 01 or 001 is No. 2 Standard Square Taper.

**FIG. 3175**

No. 02	Sleeve for 1/2-inch Round Shank Drill only.....	\$1.50
No. 03	Sleeve for 1/2-inch Round Shank Drill only.....	1.75
No. 003	Sleeve for 5/8-inch Round Shank Drill only.....	1.75
No. 04	Sleeve for 1/2-inch Round Shank Drill only.....	2.00
No. 004	Sleeve for 5/8-inch Round Shank Drill only.....	2.00

The Shank of No. 02 is No. 2 Morse Taper.

The Shank of No. 03 or No. 003 is No. 3 Morse Taper.

The Shank of No. 04 or No. 004 is No. 4 Morse Taper.

Hardened Set Screws.

**FIG. 3176**

SQUARE SHANK DRILL SLEEVES FOR SQUARE **SHANK RATCHET DRILLS**

No. 1	Sleeve.....	\$1.00
No. 2	Sleeve.....	1.25
No. 4	Sleeve.....	1.50

When ordering, state whether for No. 1 or No. 2 Square Shank.

DRILL RODS

For twist drills, taps, reamers, punches, and all small tools requiring the very highest grade of crucible cast tool steel.

Size	Equivalent Decimals of an Inch	Price, Per Pound	Size	Equivalent Decimals of an Inch	Price, Per Pound	Size	Equivalent Decimals of an Inch	Price, Per Pound	Size	Equivalent Decimals of an Inch	Price, Per Pound
1 1/4	1.250	\$0.50	7/16	0.4375	\$0.60	11	0.188	\$0.75	45	0.081	\$1.05
1 1/2	1.2343	.50	27/64	0.4218	.75	3/16	0.1875	.75	46	0.079	1.05
1 3/8	1.2187	.50	Z	0.413	.75	12	0.185	.75	5/4	0.0781	1.20
1 1/2	1.203	.50	13/32	0.4062	.75	13	0.182	.75	47	0.077	1.20
1 5/8	1.1875	.50	Y	0.404	.75	14	0.180	.75	48	0.075	1.20
1 3/4	1.1718	.50	X	0.397	.75	15	0.178	.75	49	0.072	1.20
1 7/8	1.1562	.50	25/64	0.3906	.75	16	0.175	.83	50	0.069	1.20
1 9/16	1.1406	.50	W	0.386	.75	17	0.172	.83	51	0.066	1.45
1 5/8	1.125	.50	V	0.377	.75	11/64	0.1718	.83	52	0.063	1.45
1 3/4	1.1093	.50	3/8	0.375	.75	18	0.168	.83	5/16	0.0625	1.45
1 1/2	1.0937	.50	U	0.368	.75	19	0.164	.83	53	0.058	1.45
1 5/8	1.0781	.50	23/64	0.3593	.75	20	0.161	.83	54	0.055	1.45
1 1/2	1.0625	.50	T	0.358	.75	21	0.157	.83	55	0.050	1.80
1 3/4	1.0468	.50	S	0.348	.75	5/32	0.1562	.83	5/64	0.0468	1.80
1 1/2	1.0312	.50	11/32	0.3437	.75	22	0.155	.83	56	0.045	1.80
1 5/8	1.0156	.50	R	0.339	.75	23	0.153	.83	57	0.042	1.80
1	1.000	.50	Q	0.332	.75	24	0.151	.83	58	0.041	2.10
63/64	0.9843	.50	21/64	0.3281	.75	25	0.148	.83	59	0.040	2.10
31/32	0.9687	.50	P	0.323	.75	26	0.146	.83	60	0.039	2.10
61/64	0.953	.50	O	0.316	.75	27	0.143	.83	61	0.038	2.40
15/16	0.9375	.50	5/16	0.3125	.75	9/64	0.1406	.83	62	0.037	2.40
69/64	0.9218	.50	N	0.302	.75	28	0.139	.83	63	0.036	2.70
29/32	0.9062	.50	19/64	0.2968	.75	29	0.134	.83	64	0.035	2.70
57/64	0.8906	.50	M	0.295	.75	30	0.127	.83	65	0.033	2.70
7/8	0.875	.50	L	0.290	.75	1/8	0.125	.83	66	0.032	3.00
65/64	0.8593	.50	9/32	0.2812	.75	31	0.120	.90	1/32	0.0312	3.00
27/32	0.8437	.50	K	0.281	.75	32	0.115	.90	67	0.031	3.00
63/64	0.828	.50	J	0.277	.75	33	0.112	.90	68	0.030	3.00
13/16	0.8125	.50	I	0.272	.75	34	0.110	.90	69	0.029	3.30
61/64	0.7968	.50	H	0.266	.75	5/64	0.1093	.90	70	0.027	3.30
25/32	0.7812	.50	17/64	0.2656	.75	35	0.108	.90	71	0.026	3.60
49/64	0.7656	.50	G	0.261	.75	36	0.106	.90	72	0.024	3.60
3/4	0.750	.55	F	0.257	.75	37	0.103	.90	73	0.023	3.60
47/64	0.7343	.55	E	0.250	.75	38	0.101	.90	74	0.022	3.90
23/32	0.7187	.55	1/4	0.250	.75	39	0.099	1.05	75	0.020	4.05
45/64	0.703	.55	D	0.246	.75	40	0.097	1.05	76	0.018	4.20
11/16	0.6875	.55	C	0.242	.75	41	0.095	1.05	77	0.016	4.50
43/64	0.6718	.55	B	0.238	.75	3/32	0.0937	1.05	1/4	0.0156	4.50
21/32	0.6562	.55	15/64	0.2343	.75	42	0.092	1.05	78	0.015	4.80
41/64	0.6406	.55	A	0.234	.75	43	0.088	1.05	79	0.014	5.10
5/8	0.625	.55	1	0.227	.75	44	0.085	1.05	80	0.013	5.40
39/64	0.6093	.55	2	0.219	.75	SQUARE DRILL RODS					
19/32	0.5937	.55	3/32	0.2187	.75	1/8	0.500	\$1.60	1/4	0.250	\$1.60
37/64	0.578	.55	3	0.212	.75	15/32	0.4687	1.60	3/32	0.219	1.60
9/16	0.5625	.55	4	0.207	.75	7/16	0.4375	1.60	3/16	0.1875	1.60
35/64	0.5468	.55	5	0.204	.75	13/32	0.4062	1.60	5/32	0.156	1.60
17/32	0.5312	.55	13/64	0.2031	.75	3/8	0.375	1.60	1/8	0.125	1.60
33/64	0.5156	.55	6	0.201	.75	11/32	0.344	1.60	3/32	0.094	1.60
1/2	0.500	.60	7	0.199	.75	5/16	0.3125	1.60	1/16	0.0625	1.60
61/64	0.4843	.60	8	0.197	.75	9/32	0.281	1.60	.....	.....	.....
15/32	0.4687	.60	9	0.194	.75						
29/64	0.4531	.60	10	0.191	.75						

NEW PROCESS HOT-FORGED CARBON STEEL AND HIGH-SPEED TWIST DRILLS

By the Hot-Forging Process the steel is refined and in addition the grain strength is secured which follows the spiral fluting of the Hot-Forged and Twisted Metal.

New Process—Hot-Forged High-Speed Twist Drills have twice the cutting capacity of the ordinary milled Drills.

BE SKEPTICAL. TRY THEM.

Why our High-Speed Twist Drills are Superior:

They are

HOT FORGED

HOT TWISTED

CUTTER CLEARED

SAND BLASTED

All Drills are ground to micrometer caliper gage after tempering.

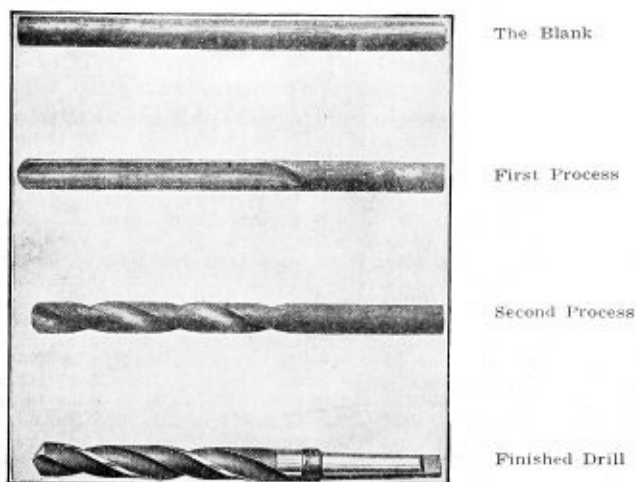


FIG. 3177

NEW PROCESS PATENT HOT FORGED TWIST DRILLS

Taper Shank Drill



FIG. 3178

Straight Shank Drill



FIG. 3179



FIG. 3180

PRICE OF DRILLS PER SET

No. 1.	Set Taper Shank Drills, $\frac{1}{16}$ to 1 in. varying by 16ths.....	\$22.40
No. 2.	Set Taper Shank Drills, $\frac{3}{8}$ to $1\frac{1}{4}$ in. varying by 16ths.....	40.10
No. 3.	Set Taper Shank Drills, $\frac{3}{8}$ to $\frac{3}{4}$ in. by 32ds, $\frac{1}{2}$ to $1\frac{1}{4}$ by 16ths.....	48.50
No. 4.	Set Taper Shank Drills, $\frac{3}{8}$ to $\frac{3}{4}$ in. by 32ds, $\frac{1}{2}$ to 2 in. by 64ths.....	186.00
No. 5.	Jobbers' Drills, $\frac{1}{16}$ to $\frac{1}{2}$ in. by 64ths, mounted.....	13.50
No. 6.	Jobbers' Drills, $\frac{1}{16}$ to $\frac{1}{2}$ in. by 32ds, mounted.....	8.00
No. 7.	Set Drills, 60 to $\frac{3}{8}$ in. by 32ds, mounted.....	14.50
No. 8.	Set Drills, Steel Wire Gage, from No. 1 to 60, mounted on wood block.....	12.50
No. 9.	Half Set Drills, alternate Nos. 1 to 59, mounted.....	7.00
No. 10.	Jewelers' Set of 36 Drills, No. 30 ($\frac{1}{16}$ in.) to No. 65, Steel Wire Gage, mounted in mahogany case with cap.....	8.00
No. 14.	Set Machine Bits, $\frac{1}{16}$ to $\frac{1}{2}$ in., mounted, varying by 32ds.....	10.50
No. 16A.	Set Bit Stock Drills, $\frac{1}{16}$ to $\frac{1}{4}$ by 32ds, $\frac{1}{4}$ to $\frac{3}{8}$ by 16ths.....	4.85
No. 16B.	Set Bit Stock Drills, $\frac{1}{8}$ to $\frac{1}{4}$ by 32ds, $\frac{1}{4}$ to $\frac{3}{8}$ by 16ths.....	4.35
No. 80.	Set Drills, Steel Wire Gage, from No. 1 to No. 60, mounted on nickel plated revolving stand.....	13.25
No. 81.	Set Drills, Jobbers, from $\frac{1}{16}$ to $\frac{1}{2}$ by 64ths, mounted on nickel plated stand.....	15.00

These Drills are all ground to Micrometer Caliper Gage.

NICKEL PLATED REVOLVING DRILL STAND

No. 80



FIG. 3181

Price, Stand with Drills, from No. 1 to No. 60.....	\$13.25
Price, Stand only.....	2.40

NICKEL PLATED DRILL STAND

No. 81

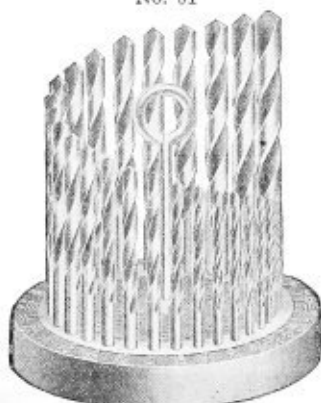


FIG. 3182

Price, Stand with Drills $\frac{1}{16}$ to $\frac{1}{2}$ inch by 64ths.....	\$15.00
Price, Stand only.....	2.40

STRAIGHT SHANK DRILLS

JOBBER'S' LENGTH



FIG. 3183

NO. 105 CARBON STEEL
NO. 105H HIGH-SPEED STEEL

NO. 106 CARBON STEEL
NO. 106H HIGH-SPEED STEEL

JOBBER'S' AND MACHINISTS' SETS					LETTER SIZES				
Diam.	Size in Decimals of 1 Inch	Length	Price Per Dozen Carbon Steel	Price Per Dozen High Speed Steel	Diam.	Size in Decimals of 1 Inch	Length	Price Per Dozen Carbon Steel	Price Per Dozen High Speed Steel
$\frac{1}{16}$	.0625	2½	\$1.60	\$5.70	A	.234	3½	\$3.00	\$7.35
$\frac{3}{32}$	.078125	2½	1.65	5.70	B	.238	3½	3.05	7.35
$\frac{1}{8}$	.09375	2½	1.70	5.70	C	.242	3½	3.10	7.35
$\frac{5}{32}$	.109375	2½	1.75	5.90	D	.246	3½	3.15	7.35
$\frac{3}{16}$	.125	3	1.80	5.90	E	.25	4	3.25	7.35
$\frac{7}{32}$	.140625	3¼	1.85	6.10	F	.257	4½	3.35	9.10
$\frac{1}{4}$	.15625	3¼	1.90	6.10	G	.261	4½	3.45	9.10
$\frac{5}{16}$	.171875	3½	2.00	6.30	H	.266	4½	3.55	9.10
$\frac{3}{8}$	.1875	3½	2.25	6.30	I	.272	4½	3.65	9.10
$\frac{7}{16}$	.203125	3½	2.50	7.00	J	.277	4½	3.70	9.10
$\frac{1}{2}$	.21875	3½	2.75	7.00	K	.281	4½	3.80	9.10
$\frac{5}{8}$	.234375	3½	3.00	7.35	L	.29	4½	3.90	10.50
$\frac{3}{4}$	.25	4	3.25	7.35	M	.295	4½	4.00	10.50
$\frac{7}{8}$	.265625	4½	3.50	9.10	N	.302	4½	4.25	10.50
$\frac{15}{16}$	.28125	4½	3.80	9.10	O	.316	4½	4.40	10.50
$\frac{15}{16}$	.296875	4½	4.00	10.50	P	.323	4½	4.60	12.00
$\frac{15}{16}$	.3125	4½	4.35	10.50	Q	.332	4½	4.75	12.00
$\frac{15}{16}$	.328125	4½	4.70	12.00	R	.339	4½	5.00	12.00
$\frac{15}{16}$	.34375	4½	5.05	12.00	S	.348	4½	5.15	13.50
$\frac{15}{16}$	.359375	4½	5.50	13.50	T	.358	4½	5.30	13.50
$\frac{15}{16}$	.375	5	6.00	13.50	U	.368	5	5.50	13.50
$\frac{15}{16}$	.390625	5½	6.50	15.00	V	.377	5	6.00	13.50
$\frac{15}{16}$	.40625	5½	7.00	15.00	W	.386	5½	6.50	15.00
$\frac{15}{16}$	.421875	5½	7.75	17.00	X	.397	5½	6.75	15.00
$\frac{15}{16}$	.4375	5½	8.50	17.00	Y	.404	5½	7.00	15.00
$\frac{15}{16}$	.453125	5½	9.25	18.75	Z	.413	5½	7.25	17.00
$\frac{15}{16}$	.46875	5½	16.00	18.75					
$\frac{15}{16}$	.484375	5½	11.00	20.00					
$\frac{15}{16}$	.5	6	12.00	20.00					

Price per set, $\frac{1}{16}$ to $\frac{1}{2}$ by 64ths, mounted.....\$13.50

Price per set, $\frac{1}{16}$ to $\frac{1}{2}$ by 32ds, mounted..... 8.00

NO. 105A STRAIGHTWAY DRILLS



FIG. 3184

Same sizes and prices as above and Wire Gage Drills on following page.

WIRE GAGE DRILLS



FIG. 3185

NO. 107 CARBON STEEL

NO. 107 H HIGH SPEED STEEL

Wire Gage No.	Price Per Dozen		Decimal Diameter, Inches	Length Over All, Inches	Wire Gage No.	Price Per Dozen		Decimal Diameter, Inches	Length Over All, Inches
	Carbon Steel	High Speed				Carbon Steel	High Speed		
1	\$2.75	\$7.00	.2280	4	41	1.70	5.70	.0960	2 ¹ / ₁₆
2	2.75	7.00	.2210	3 ¹ / ₁₆	42	1.70	5.70	.0935	2 ¹ / ₁₆
3	2.75	7.00	.2130	3 ¹ / ₁₆	43	1.70	5.70	.0890	2 ¹ / ₁₆
4	2.75	7.00	.2090	3 ¹ / ₁₆	44	1.70	5.70	.0860	2 ¹ / ₁₆
5	2.75	7.00	.2055	3 ¹ / ₁₆	45	1.70	5.70	.0820	2 ¹ / ₁₆
6	2.50	7.00	.2040	3 ¹ / ₁₆	46	1.65	5.70	.0810	2 ¹ / ₁₆
7	2.50	7.00	.2010	3 ¹ / ₁₆	47	1.65	5.70	.0785	2 ¹ / ₁₆
8	2.50	7.00	.1990	3 ¹ / ₁₆	48	1.65	5.70	.0760	2 ¹ / ₁₆
9	2.50	7.00	.1960	3 ¹ / ₁₆	49	1.65	5.70	.0730	2
10	2.50	7.00	.1935	3 ¹ / ₁₆	50	1.65	5.70	.0700	1 ¹ / ₁₆
11	2.25	6.30	.1910	3 ¹ / ₁₆	51	1.60	5.70	.0670	1 ¹ / ₁₆
12	2.25	6.30	.1890	3 ¹ / ₁₆	52	1.60	5.70	.0635	1 ¹ / ₁₆
13	2.25	6.30	.1850	3 ¹ / ₁₆	53	1.60	5.70	.0595	1 ¹ / ₁₆
14	2.25	6.30	.1820	3 ¹ / ₁₆	54	1.60	5.70	.0550	1 ¹ / ₁₆
15	2.25	6.30	.1800	3 ¹ / ₁₆	55	1.60	5.70	.0520	1 ¹ / ₁₆
16	2.00	6.30	.1770	3 ¹ / ₁₆	56	1.55	5.70	.0465	1 ¹ / ₁₆
17	2.00	6.30	.1730	3 ¹ / ₁₆	57	1.55	5.70	.0430	1 ¹ / ₁₆
18	2.00	6.30	.1695	3 ¹ / ₁₆	58	1.55	5.70	.0420	1 ¹ / ₁₆
19	2.00	6.30	.1660	3 ¹ / ₁₆	59	1.55	5.70	.0410	1 ¹ / ₁₆
20	2.00	6.30	.1610	3 ¹ / ₁₆	60	1.55	5.70	.0400	1 ¹ / ₁₆
21	1.90	6.10	.1590	3 ¹ / ₁₆	61	1.50	.....	.0390	1 ¹ / ₁₆
22	1.90	6.10	.1570	3 ¹ / ₁₆	62	1.50	.....	.0380	1 ¹ / ₁₆
23	1.90	6.10	.1540	3 ¹ / ₁₆	63	1.50	.....	.0370	1 ¹ / ₁₆
24	1.90	6.10	.1520	3 ¹ / ₁₆	64	1.50	.....	.0360	1 ¹ / ₁₆
25	1.90	6.10	.1495	3	65	1.50	.....	.0350	1 ¹ / ₁₆
26	1.80	6.10	.1470	2 ¹ / ₁₆	66	1.50	.....	.0330	1 ¹ / ₁₆
27	1.80	6.10	.1440	2 ¹ / ₁₆	67	1.50	.....	.0320	1 ¹ / ₁₆
28	1.80	6.10	.1405	2 ¹ / ₁₆	68	1.50	.....	.0310	1 ¹ / ₁₆
29	1.80	6.10	.1360	2 ¹ / ₁₆	69	1.50	.....	.02925	1 ¹ / ₁₆
30	1.80	6.10	.1285	2 ¹ / ₁₆	70	1.50	.....	.0280	1 ¹ / ₁₆
31	1.75	5.90	.1200	2 ¹ / ₁₆	71	1.50	.....	.0260	1 ¹ / ₁₆
32	1.75	5.90	.1160	2 ¹ / ₁₆	72	1.50	.....	.0250	1 ¹ / ₁₆
33	1.75	5.90	.1130	2 ¹ / ₁₆	73	1.50	.....	.0240	1 ¹ / ₁₆
34	1.75	5.90	.1110	2 ¹ / ₁₆	74	1.50	.....	.0225	1 ¹ / ₁₆
35	1.75	5.90	.1100	2 ¹ / ₁₆	75	1.50	.....	.0210	1 ¹ / ₁₆
36	1.75	5.90	.1065	2 ¹ / ₁₆	76	1.50	.....	.0200	1
37	1.75	5.90	.1040	2 ¹ / ₁₆	77	1.50	.....	.0180	1 ¹ / ₁₆
38	1.75	5.90	.1015	2 ¹ / ₁₆	78	1.50	.....	.0160	1 ¹ / ₁₆
39	1.75	5.90	.0995	2 ¹ / ₁₆	79	1.50	.....	.0145	1 ¹ / ₁₆
40	1.75	5.90	.0980	2 ¹ / ₁₆	80	1.50	.....	.0135	1 ¹ / ₁₆

DRILLS WITH MORSE TAPER OR STRAIGHT SHANKS

NO. 102 CARBON STEEL

NO. 102H HIGH SPEED STEEL

TAPER SHANK DRILL



Fig. 3186

NO. 104 CARBON STEEL

NO. 104H HIGH SPEED STEEL

STRAIGHT SHANK DRILL



Fig. 3187

Diameter, Inches	Price, Each		Length Over All, Inches	Shank Taper	Diameter, Inches	Price, Each		Length Over All, Inches	Shank Taper
	Carbon Steel	High Speed				Carbon Steel	High Speed		
$\frac{1}{16}$	\$0.45	\$0.90	4	No. 1	$\frac{3}{16}$	\$1.50	\$2.40	$8\frac{1}{2}$	No. 2
$\frac{3}{32}$	.45	.90	$4\frac{1}{2}$		$\frac{1}{2}$	1.50	2.40	$8\frac{1}{2}$	
$\frac{1}{8}$	.45	.90	$4\frac{1}{2}$		$\frac{5}{16}$	1.60	2.50	$8\frac{3}{8}$	
$\frac{3}{16}$	.45	.90	$4\frac{3}{8}$		$\frac{3}{8}$	1.60	2.50	$8\frac{3}{8}$	
$\frac{1}{4}$	.45	.90	$5\frac{1}{8}$		$\frac{7}{16}$	1.70	2.75	9	
$\frac{5}{16}$	.45	.90	$5\frac{1}{4}$		$\frac{1}{2}$	1.70	2.75	9	
$\frac{3}{8}$	.45	.90	$5\frac{3}{8}$		$\frac{9}{16}$	1.80	3.00	$9\frac{1}{4}$	
$\frac{7}{16}$	.45	.90	$5\frac{3}{4}$		$\frac{5}{8}$	1.80	3.00	$9\frac{1}{4}$	
$\frac{1}{2}$	.50	.90	$5\frac{3}{4}$		$\frac{11}{16}$	1.90	3.25	$9\frac{1}{2}$	
$\frac{9}{16}$	.50	.90	$5\frac{3}{4}$		$\frac{3}{4}$	1.90	3.25	$9\frac{1}{2}$	
$\frac{5}{8}$	.55	1.00	$5\frac{7}{8}$		$\frac{7}{8}$	2.00	3.50	$9\frac{3}{4}$	
$\frac{11}{16}$	.55	1.00	$5\frac{7}{8}$		$\frac{15}{16}$	2.00	3.50	$9\frac{3}{4}$	
$\frac{3}{4}$	.60	1.10	$6\frac{1}{8}$		$\frac{1}{2}$	2.10	3.75	$9\frac{7}{8}$	
$\frac{7}{8}$	.60	1.10	$6\frac{1}{8}$		$\frac{1}{2}$	2.10	3.75	$9\frac{7}{8}$	
$\frac{15}{16}$	.65	1.20	$6\frac{1}{4}$		$\frac{1}{2}$	2.20	4.00	10	No. 3
$\frac{1}{2}$	.65	1.20	$6\frac{1}{4}$		$\frac{1}{2}$	2.20	4.00	10	
$\frac{1}{2}$	.70	1.30	$6\frac{3}{8}$		$\frac{1}{2}$	2.40	4.40	$10\frac{1}{4}$	
$\frac{1}{2}$	.70	1.30	$6\frac{3}{8}$		$\frac{1}{2}$	2.40	4.40	$10\frac{1}{4}$	
$\frac{1}{2}$	.75	1.40	$6\frac{1}{2}$		$\frac{1}{2}$	2.60	4.75	$10\frac{1}{2}$	
$\frac{1}{2}$	.75	1.40	$6\frac{1}{2}$		$\frac{1}{2}$	2.60	4.75	$10\frac{1}{2}$	
$\frac{1}{2}$	.80	1.50	$6\frac{3}{4}$		$\frac{1}{2}$	2.80	5.15	$10\frac{5}{8}$	
$\frac{1}{2}$	.80	1.50	$6\frac{3}{4}$		$\frac{1}{2}$	2.80	5.15	$10\frac{5}{8}$	
$\frac{1}{2}$	.90	1.65	7		$\frac{1}{2}$	3.00	5.50	$10\frac{3}{4}$	
$\frac{1}{2}$	.90	1.65	7		$\frac{1}{2}$	3.00	5.50	$10\frac{3}{4}$	
$\frac{1}{2}$	1.00	1.75	$7\frac{1}{4}$		$\frac{1}{2}$	3.25	5.90	$10\frac{7}{8}$	
$\frac{1}{2}$	1.00	1.75	$7\frac{1}{4}$		$\frac{1}{2}$	3.25	5.90	$10\frac{7}{8}$	
$\frac{1}{2}$	1.10	1.90	$7\frac{1}{2}$		$\frac{1}{2}$	3.50	6.25	11	
$\frac{1}{2}$	1.10	1.90	$7\frac{1}{2}$		$\frac{1}{2}$	3.50	6.25	11	
$\frac{1}{2}$	1.20	2.00	$7\frac{3}{4}$		$\frac{1}{2}$	3.75	6.75	$11\frac{1}{8}$	
$\frac{1}{2}$	1.20	2.00	$7\frac{3}{4}$		$\frac{1}{2}$	3.75	6.75	$11\frac{1}{8}$	
$\frac{1}{2}$	1.30	2.15	8		$\frac{1}{2}$	4.00	7.25	$11\frac{1}{4}$	
$\frac{1}{2}$	1.30	2.15	8		$\frac{1}{2}$	4.00	7.25	$11\frac{1}{4}$	
$\frac{1}{2}$	1.40	2.25	$8\frac{1}{4}$		$\frac{1}{2}$	4.25	7.75	$11\frac{1}{2}$	
$\frac{1}{2}$	1.40	2.25	$8\frac{1}{4}$		$\frac{1}{2}$	4.25	7.75	$11\frac{1}{2}$	

Always give list number when ordering.

Continued on next page

DRILLS WITH MORSE TAPER OR STRAIGHT SHANKS
NO. 102 CARBON STEEL . NO. 102H HIGH SPEED STEEL
TAPER SHANK DRILL



Fig. 3183

NO. 104 CARBON STEEL . NO. 104H HIGH SPEED STEEL
STRAIGHT SHANK DRILL



Fig. 3189

Diameter, Inches	Price, Each		Length Over All, Inches	Shank Taper	Diameter, Inches	Price, Each		Length Over All, Inches	Shank Taper
	Carbon Steel	High Speed				Carbon Steel	High Speed		
1 $\frac{1}{8}$ ₆₄	\$4.50	\$8.25	11 $\frac{3}{4}$	No. 3	1 $\frac{3}{8}$ ₆₄	\$10.50	\$21.00	15 $\frac{1}{2}$	No. 4
1 $\frac{1}{4}$	4.50	8.25	11 $\frac{3}{4}$		1 $\frac{5}{8}$	10.50	21.00	15 $\frac{1}{2}$	
1 $\frac{3}{8}$ ₆₄	4.75	8.90	11 $\frac{7}{8}$		1 $\frac{7}{8}$ ₆₄	11.00	22.00	15 $\frac{3}{8}$	
1 $\frac{1}{2}$ ₃₂	4.75	8.90	11 $\frac{7}{8}$		1 $\frac{9}{16}$ ₃₂	11.00	22.00	15 $\frac{3}{8}$	
1 $\frac{5}{8}$ ₆₄	5.00	9.50	12		1 $\frac{11}{16}$ ₃₂	11.50	23.00	15 $\frac{3}{4}$	
1 $\frac{3}{4}$ ₁₆	5.00	9.50	12		1 $\frac{13}{16}$ ₁₆	11.50	23.00	15 $\frac{3}{4}$	
1 $\frac{7}{8}$ ₆₄	5.25	10.15	12 $\frac{1}{2}$		1 $\frac{15}{16}$ ₁₆	12.00	24.00	15 $\frac{7}{8}$	
1 $\frac{1}{2}$ ₃₂	5.25	10.15	12 $\frac{1}{2}$		1 $\frac{17}{32}$ ₃₂	12.00	24.00	15 $\frac{7}{8}$	
1 $\frac{1}{2}$ ₆₄	5.50	10.75	12 $\frac{1}{2}$		1 $\frac{19}{64}$	12.50	25.00	16	
1 $\frac{1}{2}$	5.50	10.75	12 $\frac{1}{2}$		1 $\frac{21}{64}$	12.50	25.00	16	
1 $\frac{1}{4}$					1 $\frac{23}{64}$	13.25	26.25	16 $\frac{1}{8}$	
1 $\frac{1}{8}$ ₆₄					1 $\frac{25}{32}$ ₃₂	13.25	26.25	16 $\frac{1}{8}$	
1 $\frac{1}{8}$ ₃₂	5.75	11.50	14 $\frac{1}{4}$		1 $\frac{27}{64}$	14.00	27.50	16 $\frac{1}{4}$	
1 $\frac{1}{8}$ ₆₄	5.75	11.50	14 $\frac{1}{4}$		1 $\frac{29}{64}$	14.00	27.50	16 $\frac{1}{4}$	
1 $\frac{1}{8}$ ₆₄	6.00	12.25	14 $\frac{1}{4}$	No. 4	1 $\frac{31}{16}$	14.75	28.75	16 $\frac{3}{8}$	No. 5
1 $\frac{1}{8}$ ₆₄	6.00	12.25	14 $\frac{1}{4}$		1 $\frac{33}{16}$	14.75	28.75	16 $\frac{3}{8}$	
1 $\frac{1}{8}$ ₆₄	6.25	13.00	14 $\frac{3}{8}$		1 $\frac{35}{32}$	15.50	30.00	16 $\frac{1}{2}$	
1 $\frac{1}{8}$ ₆₄	6.25	13.00	14 $\frac{3}{8}$		1 $\frac{37}{64}$	15.50	30.00	16 $\frac{1}{2}$	
1 $\frac{1}{8}$ ₆₄	6.50	13.75	14 $\frac{1}{2}$		1 $\frac{39}{64}$	16.25	31.25	16 $\frac{1}{2}$	
1 $\frac{1}{8}$ ₆₄	6.50	13.75	14 $\frac{1}{2}$		1 $\frac{41}{32}$ ₃₂	16.25	31.25	16 $\frac{1}{2}$	
1 $\frac{1}{8}$ ₆₄	7.00	14.65	14 $\frac{3}{4}$		1 $\frac{43}{64}$	17.00	32.50	16 $\frac{3}{4}$	
1 $\frac{1}{8}$ ₆₄	7.00	14.65	14 $\frac{3}{4}$		1 $\frac{45}{16}$	17.00	32.50	16 $\frac{3}{4}$	
1 $\frac{1}{8}$ ₆₄	7.50	15.50	14 $\frac{3}{4}$		1 $\frac{47}{32}$	17.75	33.75	16 $\frac{3}{4}$	
1 $\frac{1}{8}$ ₆₄	7.50	15.50	14 $\frac{3}{4}$		1 $\frac{49}{64}$	17.75	33.75	16 $\frac{3}{4}$	
1 $\frac{1}{8}$ ₆₄	8.00	16.40	14 $\frac{3}{4}$		1 $\frac{51}{32}$	18.50	35.00	16 $\frac{3}{4}$	
1 $\frac{1}{8}$ ₆₄	8.00	16.40	14 $\frac{3}{4}$		1 $\frac{53}{64}$	18.50	35.00	16 $\frac{3}{4}$	
1 $\frac{1}{8}$ ₆₄	8.50	17.25	15		2				
1 $\frac{1}{8}$ ₆₄	8.50	17.25	15						
1 $\frac{1}{8}$ ₆₄	9.00	18.15	15 $\frac{1}{8}$		2 $\frac{1}{64}$	19.25	36.25	16 $\frac{1}{2}$	
1 $\frac{1}{8}$ ₆₄	9.00	18.15	15 $\frac{1}{8}$		2 $\frac{1}{32}$	19.25	36.25	16 $\frac{1}{2}$	
1 $\frac{1}{8}$ ₆₄	9.50	19.00	15 $\frac{1}{4}$		2 $\frac{1}{16}$	20.00	37.50	17	
1 $\frac{1}{8}$ ₆₄	9.50	19.00	15 $\frac{1}{4}$		2 $\frac{1}{8}$	20.00	37.50	17	
1 $\frac{1}{8}$ ₆₄	10.00	20.00	15 $\frac{3}{8}$		2 $\frac{1}{4}$	20.75	38.75	17	
1 $\frac{1}{8}$ ₆₄	10.00	20.00	15 $\frac{3}{8}$		2 $\frac{3}{8}$	20.75	38.75	17	

Continued on next page

Always give list number when ordering.

DRILLS WITH MORSE TAPER OR STRAIGHT SHANKS - NO. 102 CARBON STEEL NO. 102H HIGH SPEED STEEL TAPER SHANK DRILL



Fig. 3190
 NO. 104 CARBON STEEL NO. 104A HIGH SPEED STEEL
 STRAIGHT SHANK DRILL



Fig. 3191

Diameter, Inches	Price, Each		Length Over All, Inches	Shank Taper	Diameter, Inches	Price, Each		Length Over All, Inches	Shank Taper
	Carbon Steel	High Speed				Carbon Steel	High Speed		
2 7/64	\$21.50	\$40.00	17	No. 5	2 7/64	\$37.00	\$82.50	20 1/2	No. 5
2 1/8	21.50	40.00	17		2 3/32	37.00	82.50	20 1/2	
2 1/4	22.25	41.25	17		2 1/4	38.00	85.00	20 1/2	
2 1/2	22.25	41.25	17		2 1/2	38.00	85.00	20 1/2	
2 3/8	23.00	42.50	17		2 3/8	39.25	87.50	20 1/2	
2 1/2	23.00	42.50	17		2 3/8	39.25	87.50	20 1/2	
2 13/16	23.75	43.75	17 1/2		2 13/16	40.50	90.00	20 1/2	
2 1/2	23.75	43.75	17 1/2		2 13/16	40.50	90.00	20 1/2	
2 15/16	24.50	45.00	17 1/2		2 15/16	41.75	92.50	21	
2 1/4	24.50	45.00	17 1/2		2 1/4	41.75	92.50	21	
2 11/16	25.25	47.50	17 1/2		2 11/16	43.00	95.00	21	
2 3/8	25.25	47.50	17 1/2		2 3/8	43.00	95.00	21	
2 11/8	26.00	50.00	17 1/2		2 11/8	44.25	97.50	21	
2 5/16	26.00	50.00	17 1/2		2 5/16	44.25	97.50	21	
2 1/2	26.75	52.50	18		2 1/2	45.50	100.00	21	
2 11/32	26.75	52.50	18		2 11/32	45.50	100.00	21	
2 23/64	27.50	55.00	18		2 23/64	46.75	102.50	22	
2 3/8	27.50	55.00	18		2 3/8	46.75	102.50	22	
2 25/64	28.25	57.50	18 1/2		2 25/64	48.00	105.00	22	
2 13/32	28.25	57.50	18 1/2		2 13/32	48.00	105.00	22	
2 27/64	29.00	60.00	18 1/2		2 27/64	52.00	112.50	22	
2 7/16	29.00	60.00	18 1/2		2 7/16	56.00	120.00	22	
2 29/64	29.75	62.50	19		2 29/64	60.00	127.50	22	
2 15/32	29.75	62.50	19		2 15/32	65.00	135.00	23	
2 31/64	30.50	65.00	19		2 31/64	70.00	142.50	23	
2 1/2	30.50	65.00	19		2 1/2	75.00	150.00	23	
2 33/64	31.25	67.50	19 1/4		2 33/64	80.00	157.50	23	
2 17/32	31.25	67.50	19 1/4		2 17/32	85.00	165.00	24	
2 35/64	32.00	70.00	19 1/4		2 35/64	91.00	172.50	24	
2 9/16	32.00	70.00	19 1/4		2 9/16	98.00	180.00	24	
2 37/64	33.00	72.50	19 1/2		2 37/64	105.00	187.50	24	
2 19/32	33.00	72.50	19 1/2		2 19/32	112.00	195.00	24	
2 39/64	34.00	75.00	19 1/2		2 39/64	119.00	202.50	24	
2 5/8	34.00	75.00	19 1/2		2 5/8	126.00	210.00	24	
2 41/64	35.00	77.50	20		2 41/64	133.00	217.50	24	
2 21/32	35.00	77.50	20		2 21/32	140.00	225.00	25	
2 43/64	36.00	80.00	20		2 43/64				
2 11/16	36.00	80.00	20		2 11/16				

Straight Shank Drills, 1 3/4 to 2 inches have shanks 1 1/2 inches diameter, 4 3/4 inches long.

Straight Shank Drills 2 1/4 to 3 inches have shanks 1 3/4 inches diameter, 6 inches long.

HOT FORGED TAPER SHANK DRILLS

SHANKS LARGER THAN REGULAR



FIG. 3192

NO. 102. SPECIAL CARBON STEEL

NO. 102 H. SPECIAL HIGH SPEED STEEL

Diam.	Length	Price Each, Carbon Steel	Price High Speed Steel	Taper Shank	Diam.	Length	Price Each, Carbon Steel	Price High Speed Steel	Taper Shank
$\frac{1}{16}$	$6\frac{1}{2}$	\$1.40	\$2.80	No. 2	$\frac{1}{16}$	$10\frac{3}{8}$	\$3.10	\$5.45	No. 3
$\frac{1}{8}$	$6\frac{3}{4}$	1.40	2.80		$\frac{1}{8}$	$10\frac{1}{2}$	3.20	5.60	
$\frac{1}{4}$	$6\frac{3}{4}$	1.40	2.80		$\frac{1}{4}$	$10\frac{1}{2}$	3.20	5.60	
$\frac{3}{8}$	7	1.40	2.80		$\frac{3}{8}$	$10\frac{3}{8}$	3.30	5.75	
$\frac{1}{2}$	7	1.40	2.80		$\frac{1}{2}$	$10\frac{3}{8}$	3.30	5.75	No. 4
$\frac{5}{8}$	$7\frac{1}{4}$	1.40	2.80		$\frac{5}{8}$	12	5.40	10.50	
$\frac{3}{4}$	$7\frac{1}{4}$	1.40	2.80		$\frac{3}{4}$	12	5.40	10.50	
$\frac{7}{8}$	$7\frac{1}{2}$	1.40	2.80		$\frac{7}{8}$	$12\frac{1}{4}$	5.60	10.80	
$1\frac{1}{8}$	$7\frac{1}{2}$	1.40	2.80		$1\frac{1}{8}$	$12\frac{1}{4}$	5.60	10.80	
$1\frac{1}{4}$	$7\frac{3}{4}$	1.45	3.00		$1\frac{1}{4}$	$12\frac{1}{2}$	5.80	11.10	
$1\frac{1}{2}$	$7\frac{3}{4}$	1.45	3.00		$1\frac{1}{2}$	$12\frac{1}{2}$	5.80	11.10	
$1\frac{3}{4}$	8	1.50	3.00		$1\frac{3}{4}$	$12\frac{3}{4}$	6.00	11.55	
$2\frac{1}{8}$	8	1.50	3.00		$2\frac{1}{8}$	$12\frac{3}{4}$	6.00	11.55	
$2\frac{1}{4}$	$8\frac{1}{4}$	1.60	3.20		$2\frac{1}{4}$	13	6.20	12.00	
$2\frac{1}{2}$	$8\frac{1}{4}$	1.60	3.20		$2\frac{1}{2}$	13	6.20	12.00	
$2\frac{3}{4}$	$8\frac{1}{2}$	1.70	3.20	No. 3	$2\frac{3}{4}$	$16\frac{1}{2}$	13.25	25.00	No. 3
$3\frac{1}{8}$	$8\frac{1}{2}$	1.70	3.20		$3\frac{1}{8}$	$16\frac{1}{2}$	13.25	25.00	
$3\frac{1}{4}$	9	2.50	4.60		$3\frac{1}{4}$	$16\frac{1}{2}$	14.00	26.25	
$3\frac{3}{8}$	9	2.50	4.60		$3\frac{3}{8}$	$16\frac{1}{2}$	14.00	26.25	
$3\frac{1}{2}$	$9\frac{1}{2}$	2.50	4.60		$3\frac{1}{2}$	$16\frac{1}{2}$	14.75	27.50	
$3\frac{3}{4}$	$9\frac{1}{2}$	2.50	4.60		$3\frac{3}{4}$	$16\frac{1}{2}$	14.75	27.50	
$4\frac{1}{8}$	9	2.50	4.60		$4\frac{1}{8}$	$16\frac{1}{2}$	15.50	28.75	
$4\frac{1}{4}$	9	2.50	4.60		$4\frac{1}{4}$	$16\frac{1}{2}$	15.50	28.75	
$4\frac{3}{8}$	$9\frac{3}{8}$	2.60	4.60		$4\frac{3}{8}$	$16\frac{1}{2}$	16.25	30.00	
$4\frac{1}{2}$	9	2.60	4.60		$4\frac{1}{2}$	$16\frac{1}{2}$	16.25	30.00	
$4\frac{3}{4}$	$9\frac{7}{8}$	2.70	5.00		$4\frac{3}{4}$	$16\frac{1}{2}$	17.00	31.25	
$5\frac{1}{8}$	$9\frac{7}{8}$	2.70	5.00		$5\frac{1}{8}$	$16\frac{1}{2}$	17.00	31.25	
$5\frac{1}{4}$	10	2.80	5.00	No. 3	$5\frac{1}{4}$	$16\frac{1}{2}$	17.75	32.50	No. 3
$5\frac{3}{8}$	10	2.80	5.00		$5\frac{3}{8}$	$16\frac{1}{2}$	17.75	32.50	
$5\frac{1}{2}$	$10\frac{1}{8}$	2.90	5.00		$5\frac{1}{2}$	$16\frac{1}{2}$	18.50	33.75	
$5\frac{3}{4}$	$10\frac{1}{8}$	2.90	5.00		$5\frac{3}{4}$	$16\frac{1}{2}$	18.50	33.75	
$6\frac{1}{8}$	$10\frac{1}{4}$	3.00	5.45		$6\frac{1}{8}$	$16\frac{1}{2}$	19.25	35.00	
$6\frac{1}{4}$	$10\frac{1}{4}$	3.00	5.45		$6\frac{1}{4}$	$16\frac{1}{2}$	19.25	35.00	
$6\frac{3}{8}$	$10\frac{3}{8}$	3.10	5.45		$6\frac{3}{8}$	$16\frac{1}{2}$	19.25	35.00	
$6\frac{1}{2}$	$10\frac{3}{8}$	3.10	5.45		$6\frac{1}{2}$	$16\frac{1}{2}$	19.25	35.00	

DRILLS FITTING BLACKSMITHS' DRILL PRESSES

NO. 112 CARBON STEEL

NO. 112H HIGH SPEED STEEL

SHORT LENGTHS



FIG. 3193

Shanks $\frac{1}{2}$ inch diameter and $2\frac{1}{4}$ inches long.

Diameter, Inches	Price, Each		Length Over All, Inches	Diameter, Inches	Price, Each		Length Over All, Inches
	Carbon Steel	High Speed			Carbon Steel	High Speed	
$\frac{1}{8}$	\$0.45	.....	$4\frac{1}{8}$	$2\frac{7}{32}$	\$2.00	\$3.15	6
$\frac{9}{32}$	.45	.....	$4\frac{1}{8}$	$\frac{7}{8}$	2.10	3.30	6
$\frac{7}{16}$	.50	.....	$5\frac{1}{8}$	$2\frac{29}{32}$	2.20	3.50	6
$\frac{3}{8}$	.55	.....	$5\frac{1}{8}$	$1\frac{15}{16}$	2.30	3.70	6
$\frac{1}{4}$	.60	\$1.10	6	$2\frac{31}{32}$	2.40	3.90	6
$\frac{9}{32}$	.65	1.20	6	1	2.50	4.10	6
$\frac{5}{16}$	.70	1.30	6	$1\frac{1}{32}$	2.60	4.30	6
$1\frac{1}{32}$	.75	1.40	6	$1\frac{1}{16}$	2.70	4.50	6
$\frac{3}{8}$	.80	1.45	6	$1\frac{3}{32}$	2.80	4.75	6
$1\frac{3}{32}$	.85	1.55	6	$1\frac{1}{8}$	2.90	5.00	6
$\frac{7}{16}$	.90	1.60	6	$1\frac{5}{32}$	3.00	5.25	6
$1\frac{5}{32}$	.95	1.70	6	$1\frac{7}{16}$	3.10	5.50	6
$\frac{1}{2}$	1.00	1.75	6	$1\frac{9}{32}$	3.20	5.80	6
$1\frac{9}{32}$	1.05	1.90	6	$1\frac{1}{4}$	3.30	6.10	6
$\frac{9}{16}$	1.10	2.05	6	$1\frac{13}{32}$	3.45	6.40	6
$1\frac{13}{32}$	1.20	2.20	6	$1\frac{5}{16}$	3.60	6.70	6
$\frac{5}{8}$	1.30	2.30	6	$1\frac{11}{16}$	3.75	7.00	6
$1\frac{11}{16}$	1.40	2.40	6	$1\frac{3}{8}$	3.90	7.40	6
$1\frac{1}{16}$	1.50	2.50	6	$1\frac{13}{32}$	4.05	7.80	6
$2\frac{1}{32}$	1.60	2.65	6	$1\frac{7}{16}$	4.20	8.20	6
$\frac{3}{4}$	1.70	2.75	6	$1\frac{15}{32}$	4.35	8.60	6
$2\frac{5}{32}$	1.80	2.90	6	$1\frac{1}{2}$	4.50	9.00	6
$1\frac{1}{16}$	1.90	3.00	6				

High speed drills with $\frac{1}{2}$ -inch shanks will be furnished in sizes over $\frac{3}{4}$ -inch diameter only at customer's risk, as we do not consider the shanks strong enough.

Unless otherwise specified these drills will always be furnished with fluted shanks.

Always give list number when ordering.

DRILLS FITTING BLACKSMITHS' DRILL PRESSES



FIG. 3194

Taper Lengths. With Shanks $\frac{1}{2}$ Inch Diameter

NO. 111 CARBON STEEL

NO. 111 H. HIGH SPEED STEEL

Diameter	Length, Inches	Price Each, Carbon Steel	Price Each, High Speed Steel	Diameter	Length, Inches	Price Each, Carbon Steel	Price Each, High Speed Steel
$\frac{1}{8}$	5 $\frac{1}{8}$	\$0.45	....	$\frac{1}{2}$	10	\$2.20	\$4.00
$\frac{3}{16}$	5 $\frac{3}{8}$	.45	....	$\frac{5}{8}$	10 $\frac{1}{4}$	2.40	4.40
$\frac{1}{4}$	5 $\frac{1}{2}$	.50	....	$\frac{7}{8}$	10 $\frac{1}{2}$	2.60	4.75
$\frac{5}{16}$	5 $\frac{7}{8}$	.55	....	$\frac{1}{2}$	10 $\frac{3}{4}$	2.80	5.15
$\frac{3}{8}$	6 $\frac{1}{8}$	.60	\$1.10	$\frac{1}{2}$	10 $\frac{3}{4}$	3.00	5.50
$\frac{7}{16}$	6 $\frac{1}{4}$	.65	1.20	$\frac{1}{2}$	10 $\frac{3}{4}$	3.25	5.90
$\frac{1}{2}$	6 $\frac{3}{8}$	.70	1.30	1	11	3.50	6.25
$\frac{5}{8}$	6 $\frac{1}{2}$	.75	1.40	$1\frac{1}{2}$	11 $\frac{1}{8}$	3.75	6.75
$\frac{3}{4}$	6 $\frac{3}{4}$	.80	1.50	$1\frac{1}{2}$	11 $\frac{1}{4}$	4.00	7.25
$\frac{7}{8}$	7	.90	1.65	$1\frac{1}{2}$	11 $\frac{1}{2}$	4.25	7.75
$1\frac{1}{8}$	7 $\frac{1}{4}$	1.00	1.75	$1\frac{1}{2}$	11 $\frac{3}{4}$	4.50	8.25
$1\frac{1}{4}$	7 $\frac{1}{2}$	1.10	1.90	$1\frac{1}{2}$	11 $\frac{3}{4}$	4.75	8.90
$1\frac{1}{2}$	7 $\frac{3}{4}$	1.20	2.00	$1\frac{1}{2}$	12	5.00	9.50
$1\frac{3}{4}$	8	1.30	2.15	$1\frac{1}{2}$	12 $\frac{1}{4}$	5.50	10.75
2	8 $\frac{1}{4}$	1.40	2.25	$1\frac{1}{2}$	12 $\frac{1}{4}$	....	11.50
$2\frac{1}{8}$	8 $\frac{1}{2}$	1.50	2.40	$1\frac{1}{2}$	12 $\frac{3}{8}$	....	12.25
$2\frac{1}{4}$	8 $\frac{3}{4}$	1.60	2.50	$1\frac{1}{2}$	12 $\frac{3}{8}$	....	13.00
$2\frac{1}{2}$	9	1.70	2.75	$1\frac{1}{2}$	12 $\frac{1}{2}$	....	13.75
$2\frac{3}{4}$	9 $\frac{1}{4}$	1.80	3.00	$1\frac{1}{2}$	12 $\frac{1}{2}$	....	14.65
3	9 $\frac{1}{2}$	1.90	3.25	$1\frac{1}{2}$	12 $\frac{3}{4}$	....	15.50
$3\frac{1}{8}$	9 $\frac{3}{4}$	2.00	3.50	$1\frac{1}{2}$	12 $\frac{3}{4}$	....	16.40
$3\frac{1}{4}$	9 $\frac{7}{8}$	2.10	3.75	$1\frac{1}{2}$	12 $\frac{3}{4}$	....	17.25

In ordering state whether taper lengths or short lengths are wanted. See following page for short lengths.

DRILLS FITTING BLACKSMITHS' DRILL PRESSES

NO. 110 CARBON STEEL

NO. 110 H HIGH SPEED STEEL



FIG. 3195

Drills on this page have shanks about $\frac{1}{4}$ in. diameter (commonly called $\frac{5}{8}$ in.) and $2\frac{1}{4}$ inches long.

Diameter, Inches	Price, Each		Length Over All, Inches	Diameter, Inches	Price, Each		Length Over All, Inches
	Carbon Steel	High Speed			Carbon Steel	High Speed	
$\frac{1}{8}$	\$0.50	.....	4 $\frac{7}{8}$	$\frac{27}{32}$	\$2.00	\$3.15	6
$\frac{5}{32}$	.55	.....	4 $\frac{7}{8}$	$\frac{7}{8}$	2.10	3.30	6
$\frac{3}{16}$	.60	.....	5 $\frac{5}{8}$	$\frac{29}{32}$	2.20	3.50	6
$\frac{7}{32}$	.65	.....	5 $\frac{5}{8}$	$\frac{15}{16}$	2.30	3.70	6
$\frac{1}{4}$	.70	\$1.20	6	$\frac{31}{32}$	2.40	3.90	6
$\frac{9}{32}$	.75	1.30	6	1	2.50	4.10	6
$\frac{5}{16}$	.80	1.40	6	$1\frac{1}{32}$	2.60	4.30	6
$\frac{11}{32}$	.85	1.50	6	$1\frac{1}{16}$	2.70	4.50	6
$\frac{3}{8}$	.90	1.55	6	$1\frac{3}{32}$	2.80	4.75	6
$\frac{13}{32}$	.95	1.65	6	$1\frac{1}{2}$	2.90	5.00	6
$\frac{7}{16}$	1.00	1.70	6	$1\frac{5}{32}$	3.00	5.25	6
$\frac{15}{32}$	1.05	1.80	6	$1\frac{7}{16}$	3.10	5.50	6
$\frac{1}{2}$	1.10	1.85	6	$1\frac{9}{32}$	3.20	5.80	6
$\frac{17}{32}$	1.15	1.95	6	$1\frac{1}{4}$	3.30	6.10	6
$\frac{9}{16}$	1.20	2.05	6	$1\frac{11}{32}$	3.45	6.40	6
$\frac{19}{32}$	1.25	2.20	6	$1\frac{13}{16}$	3.60	6.70	6
$\frac{5}{8}$	1.30	2.30	6	$1\frac{15}{32}$	3.75	7.00	6
$\frac{21}{32}$	1.40	2.40	6	$1\frac{3}{8}$	3.90	7.40	6
$\frac{11}{16}$	1.50	2.50	6	$1\frac{17}{32}$	4.05	7.80	6
$\frac{23}{32}$	1.60	2.65	6	$1\frac{7}{16}$	4.20	8.20	6
$\frac{3}{4}$	1.70	2.75	6	$1\frac{19}{32}$	4.35	8.60	6
$\frac{25}{32}$	1.80	2.90	6	$1\frac{1}{2}$	4.50	9.00	6
$\frac{13}{16}$	1.90	3.00	6	.....	.....	.....	.....

High speed drills with $\frac{5}{8}$ -inch shank will be furnished in sizes over $\frac{3}{4}$ -inch diameter only at customer's risk, as we do not consider the shanks strong enough.

TAPER SQUARE SHANK RATCHET DRILLS

NO. 104 A CARBON STEEL

NO. 104 B HIGH SPEED STEEL



FIG. 3196

Diameter, Inches	Price, Each		Length Over All, Inches	Diameter, Inches	Price, Each		Length Over All, Inches
	Carbon Steel	High Speed			Carbon Steel	High Speed	
1/8	\$0.90	.....	4 1/2	1 1/2	\$2.40	\$5.25	8
5/32	.95	.....	4 1/2	1 1/4	2.55	5.50	8 1/2
3/16	.95	.....	4 1/2	1 1/8	2.70	5.75	8 1/2
7/32	1.00	.....	5	1 1/16	2.85	6.00	8 1/2
1/4	1.00	\$2.50	5	1 1/8	3.00	6.30	8 1/2
9/32	1.05	2.55	5	1 3/8	3.10	6.70	9
5/16	1.10	2.60	5	1 1/2	3.25	7.00	9
11/32	1.15	2.65	5	1 5/8	3.35	7.30	9
3/8	1.20	2.70	6	1 3/4	3.50	7.60	9
13/32	1.25	2.75	6 1/4	1 7/8	3.65	7.90	9
7/16	1.25	2.80	6 1/4	1 3/2	3.75	8.25	9
15/32	1.30	2.85	6 1/4	1 5/8	3.90	8.60	9
1/2	1.30	2.90	6 1/2	1 11/16	4.05	9.00	9
17/32	1.35	2.95	6 1/2	1 3/4	4.20	9.40	9
9/16	1.35	3.00	6 1/2	1 13/16	4.35	9.80	9
19/32	1.40	3.10	6 1/2	1 7/8	4.50	10.20	9
5/8	1.40	3.20	6 1/2	1 15/16	4.65	10.60	9
21/32	1.45	3.30	6 1/2	1 1/2	4.80	11.00	9
11/16	1.45	3.40	6 1/2	1 5/8	5.10	.....	9
23/32	1.50	3.50	6 1/2	1 5/8	5.40	.....	9
3/4	1.55	3.65	6 1/2	1 11/16	5.75	.....	9
25/32	1.65	3.80	6 1/2	1 3/4	6.10	.....	9
13/16	1.75	4.00	7	1 13/16	6.50	.....	9
27/32	1.90	4.20	7	1 7/8	6.90	.....	9
7/8	2.05	4.50	7 1/2	1 15/16	7.30	.....	9
29/32	2.20	4.70	7 1/2	2	7.75	.....	9
15/16	2.30	5.00	8	.....	.....	.....	.....

No. 1 shanks, 3/8 x 5/8 x 1 1/2 inches long; No. 2 shanks, 1/2 x 3/4 x 1 3/4 inches long.

Unless otherwise specified No. 1 shank will be furnished, except on high speed drills over 1 inch, which will be equipped with No. 2 shank.

To avoid mistakes in ordering specify number, or dimensions, of shank.

Always give list number when ordering.

NO. 109 BIT STOCK DRILLS

FOR METAL OR WOOD



FIG. 3197

Diam.	Price Per Dozen	Whole Length Inches	Length From Shank to Point Inches	Diam.	Price Per Dozen	Whole Length Inches	Length From Shank to Point Inches
2/32	\$2.50	3 3/8	1 1/2	14/32	\$10.50	6 1/4	5
3/32	2.70	3 3/8	1 7/8	15/32	11.75	6 5/8	5 1/4
4/32	3.00	4 1/8	2 1/8	16/32	13.00	6 3/4	5 1/2
5/32	3.50	4 1/8	2 5/8	17/32	14.25	7 1/8	5 5/8
6/32	4.00	4 3/4	2 7/8	9/16	15.50	7 1/2	5 3/4
7/32	4.50	5 1/4	3 1/8	5/8	18.00	7 1/2	5 5/8
8/32	5.00	5 5/8	4 1/8	11/16	21.00	7 1/2	5 3/4
9/32	6.00	5 3/4	4 1/4	3/4	24.00	7 1/2	5 5/8
10/32	7.00	5 1/2	4 3/8	13/16	27.00	7 1/2	5 5/8
11/32	8.00	5 7/8	4 3/4	7/8	30.00	7 1/2	5 5/8
12/32	8.50	5 3/4	4 3/8	15/16	33.00	7 1/2	5 5/8
13/32	9.25	5 3/8	4 7/8	1	36.00	7 1/2	5 5/8

No. 16



FIG. 3198

BIT STOCK DRILL SETS

No. 16 Set includes following sizes of Bit Stock Drills: 2, 3, 4, 5, 6, 7, 8, 10 and 12/32. Cases, Natural Wood, Stained Cherry and Orange. Price.....\$4.25

No. 16-A. The case furnished with this set is covered with leatherette in either green or maroon.

Letters and sizes in gold.

No. 16-A Set includes the following sizes of Bit Stock Drills: 2, 3, 4, 5, 6, 7, 8, 10 and 12/32. Price.....\$4.85

No. 16-B Set includes the following sizes of Bit Stock Drills: 4, 5, 6, 7, 8, 10 and 12/32. Price.....\$4.35

No. 16A

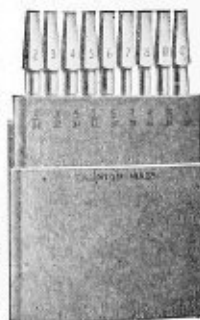


FIG. 3199

NO. 120. HOT FORGED FOUR-GROOVE DRILLS

WITH MORSE TAPER OR STRAIGHT SHANKS



FIG. 3200

Diam.	Length	Length of Flutes	Price Each	Socket for Morse Taper	Diam.	Length	Length of Flutes	Price Each	Socket for Morse Taper
$\frac{1}{4}$	6 $\frac{1}{2}$	3 $\frac{3}{4}$	\$1.00	No. 1	$1\frac{1}{2}$	14 $\frac{1}{2}$	9 $\frac{1}{2}$	\$5.75	No. 4
$\frac{3}{8}$	6 $\frac{1}{4}$	3 $\frac{1}{2}$	1.05		$1\frac{3}{8}$	14 $\frac{1}{4}$	9 $\frac{1}{4}$	6.00	
$\frac{1}{2}$	6 $\frac{3}{8}$	3 $\frac{3}{8}$	1.10		$1\frac{1}{2}$	14 $\frac{3}{8}$	9 $\frac{3}{8}$	6.25	
$\frac{5}{8}$	6 $\frac{1}{2}$	3 $\frac{3}{4}$	1.15		$1\frac{3}{8}$	14 $\frac{1}{2}$	9 $\frac{1}{2}$	6.50	
$\frac{3}{4}$	6 $\frac{3}{4}$	4	1.20		$1\frac{1}{2}$	14 $\frac{3}{4}$	9 $\frac{3}{4}$	7.00	
$\frac{7}{8}$	7	4 $\frac{1}{4}$	1.25		$1\frac{7}{8}$	14 $\frac{3}{4}$	9 $\frac{3}{4}$	7.50	
$1\frac{1}{8}$	7 $\frac{1}{4}$	4 $\frac{1}{2}$	1.30		$1\frac{1}{2}$	14 $\frac{7}{8}$	9 $\frac{7}{8}$	8.00	
$1\frac{1}{4}$	7 $\frac{1}{2}$	4 $\frac{3}{4}$	1.40		$1\frac{1}{2}$	15	10	8.50	
$1\frac{1}{2}$	7 $\frac{3}{4}$	5	1.50		$1\frac{1}{2}$	15 $\frac{1}{8}$	10 $\frac{1}{8}$	9.00	
$1\frac{3}{4}$	8	5 $\frac{1}{4}$	1.60		$1\frac{7}{8}$	15 $\frac{1}{4}$	10 $\frac{1}{4}$	9.50	
2	8 $\frac{1}{4}$	5 $\frac{1}{2}$	1.70	No. 2	$1\frac{1}{2}$	15 $\frac{3}{8}$	10 $\frac{3}{8}$	10.00	No. 5
$2\frac{1}{8}$	8 $\frac{1}{2}$	5 $\frac{3}{4}$	1.80		$1\frac{3}{8}$	15 $\frac{1}{2}$	10 $\frac{1}{2}$	10.50	
$2\frac{1}{4}$	8 $\frac{3}{4}$	5 $\frac{3}{4}$	1.90		$1\frac{1}{2}$	15 $\frac{5}{8}$	10 $\frac{5}{8}$	11.00	
$2\frac{3}{8}$	9	6	2.00		$1\frac{1}{2}$	15 $\frac{3}{4}$	10 $\frac{3}{4}$	11.50	
$2\frac{1}{2}$	9 $\frac{1}{4}$	6 $\frac{1}{4}$	2.10		$1\frac{3}{8}$	15 $\frac{7}{8}$	10 $\frac{7}{8}$	12.00	
$2\frac{3}{4}$	9 $\frac{1}{2}$	6 $\frac{1}{2}$	2.25		$1\frac{3}{8}$	16	11	12.50	
$2\frac{7}{8}$	9 $\frac{3}{4}$	6 $\frac{3}{4}$	2.40		$1\frac{3}{8}$	16 $\frac{1}{8}$	11 $\frac{1}{8}$	13.25	
3	9 $\frac{7}{8}$	6 $\frac{7}{8}$	2.55		$1\frac{1}{2}$	16 $\frac{1}{4}$	11 $\frac{1}{4}$	14.00	
$3\frac{1}{8}$	10	7	2.70		$1\frac{3}{8}$	16 $\frac{3}{8}$	11 $\frac{3}{8}$	14.75	
$3\frac{1}{4}$	10 $\frac{1}{4}$	7 $\frac{1}{4}$	2.85		$1\frac{3}{8}$	16 $\frac{1}{2}$	11 $\frac{1}{2}$	15.50	
$3\frac{3}{8}$	10 $\frac{1}{2}$	7 $\frac{1}{2}$	3.00	No. 3	$1\frac{3}{8}$	16 $\frac{1}{2}$	11 $\frac{1}{2}$	16.25	
$3\frac{1}{2}$	10 $\frac{3}{8}$	7 $\frac{3}{8}$	3.15		$1\frac{1}{2}$	16 $\frac{3}{4}$	11 $\frac{3}{4}$	17.00	
$3\frac{3}{4}$	10 $\frac{7}{8}$	7 $\frac{7}{8}$	3.30		$1\frac{3}{8}$	16 $\frac{7}{8}$	11 $\frac{7}{8}$	17.75	
$3\frac{7}{8}$	10 $\frac{3}{4}$	7 $\frac{3}{4}$	3.45		2	16 $\frac{1}{2}$	11 $\frac{1}{2}$	18.50	
4	11	7 $\frac{1}{2}$	3.60		$2\frac{1}{8}$	16 $\frac{1}{2}$	10 $\frac{1}{2}$	19.25	
$4\frac{1}{8}$	11 $\frac{1}{8}$	7 $\frac{1}{8}$	3.75		$2\frac{1}{8}$	17	11	20.00	
$4\frac{1}{4}$	11 $\frac{1}{4}$	7 $\frac{1}{4}$	4.00		$2\frac{1}{8}$	17	11	21.50	
$4\frac{3}{8}$	11 $\frac{1}{2}$	7 $\frac{1}{2}$	4.25		$2\frac{3}{8}$	17	11	23.00	
$4\frac{1}{2}$	11 $\frac{3}{8}$	8	4.50		$2\frac{1}{4}$	17 $\frac{1}{2}$	11 $\frac{1}{2}$	24.50	
$4\frac{3}{4}$	11 $\frac{7}{8}$	8 $\frac{1}{8}$	4.75		$2\frac{3}{8}$	17 $\frac{3}{8}$	11 $\frac{3}{8}$	26.00	
$4\frac{7}{8}$	12	8 $\frac{1}{4}$	5.00		$2\frac{3}{8}$	18	12	27.50	
5	12 $\frac{1}{8}$	8 $\frac{1}{2}$	5.25		$2\frac{7}{8}$	18 $\frac{1}{2}$	12 $\frac{1}{2}$	29.00	
$5\frac{1}{4}$	12 $\frac{1}{4}$	8 $\frac{3}{4}$	5.50		$2\frac{1}{2}$	19	13	30.50	

These reamers are ground exact to size, and are furnished by 64ths if ordered. Special sizes and lengths made to order.

NO. 122. HOT FORGED FOUR-GROOVE DRILLS



FIG. 3201

STRAIGHT SHANK, SHORT LENGTH

Our Hot Forged Four Groove Drills are made by our patented hot forging process, which we use in manufacturing our Drills and which renders them tougher and stronger than it is possible to attain by milling. These Drills were designed for working in cored holes, but will work equally as well wherever a Chucking Reamer can be used.

A trial order will prove their superiority.

Size	Length	Length of Flutes	Price Per Dozen	Price Each
$\frac{1}{4}$	4	$2\frac{3}{4}$	\$4.75	\$0.42
$\frac{3}{16}$	$4\frac{1}{8}$	$2\frac{7}{8}$	5.10	.45
$\frac{1}{8}$	$4\frac{1}{4}$	$2\frac{7}{8}$	5.50	.48
$\frac{7}{16}$	$4\frac{3}{8}$	3	5.85	.53
$\frac{1}{2}$	$4\frac{1}{2}$	$3\frac{1}{8}$	6.30	.56
$\frac{5}{8}$	$4\frac{5}{8}$	$3\frac{1}{8}$	6.75	.60
$\frac{3}{4}$	$4\frac{3}{4}$	$3\frac{1}{4}$	7.20	.63
$\frac{7}{8}$	$4\frac{7}{8}$	$3\frac{3}{8}$	7.65	.67
$\frac{15}{16}$	5	$3\frac{1}{2}$	8.10	.71
$\frac{1}{2}$	$5\frac{1}{8}$	$3\frac{1}{2}$	8.55	.75
$\frac{13}{16}$	$5\frac{1}{4}$	$3\frac{5}{8}$	9.00	.79
$\frac{11}{16}$	$5\frac{3}{8}$	$3\frac{3}{4}$	9.60	.83
$\frac{9}{16}$	$5\frac{1}{2}$	$3\frac{3}{4}$	10.20	.87
$\frac{7}{16}$	$5\frac{5}{8}$	$3\frac{3}{4}$	10.80	.94
$\frac{5}{16}$	$5\frac{3}{4}$	4	11.25	.98
$\frac{3}{16}$	$5\frac{7}{8}$	$4\frac{1}{8}$	11.65	1.01
$\frac{1}{16}$	6	$4\frac{1}{4}$	12.00	1.05

No. 17 Set, $\frac{1}{4}$ to $\frac{1}{2}$ by 64ths, mounted.....\$12.00

No. 18 Set, $\frac{1}{4}$ to $\frac{1}{2}$ by 32ds, mounted..... 6.50

HOT FORGED HIGH SPEED THREE OR FOUR FLUTED DRILLS

WITH TAPER OR STRAIGHT SHANK



FIG. 3202

- No. 119H. Taper Shank Three Fluted Drills.
 No. 120H. Taper Shank Four Fluted Drills.
 No. 121H. Straight Shank Three Fluted Drills.
 No. 122H. Straight Shank Four Fluted Drills.

Diameter, Inches	Decimal Equivalent	Price, Each	Length Over All, Inches	Length Twist, Inches	Standard Taper Shank
$\frac{1}{4}$	.2500	\$2.00	$6\frac{1}{8}$	3	No. 1
$\frac{1}{2}$	.3125	2.25	$6\frac{3}{8}$	$3\frac{1}{4}$	
$\frac{3}{8}$	.3750	2.50	$6\frac{3}{4}$	$3\frac{1}{2}$	
$\frac{7}{16}$	.4375	2.75	$7\frac{1}{4}$	4	
$\frac{1}{2}$	.5000	3.00	$7\frac{3}{4}$	$4\frac{1}{2}$	
$\frac{5}{8}$	.5625	3.25	$8\frac{1}{4}$	5	
$\frac{5}{8}$	.6250	3.75	$8\frac{3}{4}$	$5\frac{1}{4}$	No. 2
$\frac{11}{16}$	.6875	4.25	$9\frac{1}{4}$	$5\frac{1}{2}$	
$\frac{3}{4}$	.7500	5.00	$9\frac{3}{4}$	$6\frac{1}{8}$	
$\frac{13}{16}$	.8125	5.75	10	$6\frac{1}{4}$	
$\frac{7}{8}$	.8750	6.50	$10\frac{1}{2}$	$6\frac{3}{8}$	
$\frac{1}{2}$	.9375	7.50	$10\frac{3}{4}$	$6\frac{5}{8}$	No. 3
1	1.0000	8.50	11	$6\frac{7}{8}$	
$1\frac{1}{16}$	1.0625	9.50	$11\frac{1}{4}$	$7\frac{1}{8}$	
$1\frac{1}{8}$	1.1250	11.00	$11\frac{3}{4}$	$7\frac{3}{8}$	
$1\frac{1}{4}$	1.1875	12.50	12	$7\frac{7}{8}$	
$1\frac{1}{2}$	1.2500	14.00	$12\frac{1}{2}$	$8\frac{1}{4}$	
$1\frac{5}{16}$	1.3125	15.50	$14\frac{1}{4}$	$8\frac{3}{4}$	No. 4
$1\frac{3}{8}$	1.3750	17.00	$14\frac{1}{2}$	9	
$1\frac{7}{16}$	1.4375	18.50	$14\frac{3}{4}$	$9\frac{1}{4}$	
$1\frac{1}{2}$	1.5000	20.00	15	$9\frac{1}{2}$	

Sizes not listed furnished at price of next larger size listed.

(List continued on following page.)

HOT FORGED HIGH SPEED THREE OR FOUR-FLUTED DRILLS

WITH TAPER OR STRAIGHT SHANK



FIG. 3203

- No. 119H. Taper Shank Three Fluted Drills.
 No. 120H. Taper Shank Four Fluted Drills.
 No. 121H. Straight Shank Three Fluted Drills.
 No. 122H. Straight Shank Four Fluted Drills.

Diameter, Inches	Decimal Equivalent	Price, Each	Length Over All, Inches	Length Twist, Inches	Standard Taper Shank
1 1/2	1.5625	\$21.50	15 1/4	9 3/4	No. 4
1 5/8	1.6250	23.00	15 1/2	10	
1 3/4	1.6875	24.50	15 3/4	10 1/4	
1 7/8	1.7500	26.50	16	10 1/2	
1 15/16	1.8125	28.50	16 1/4	10 3/4	
1 7/8	1.8750	30.50	16 1/2	10 5/8	
1 15/16	1.9375	32.50	16 3/4	10 3/4	
2	2.0000	34.50	16 1/2	10 5/8	
2 1/16	2.0625	37.50	17	10	No. 5
2 1/8	2.1250	40.50	17	10	
2 3/16	2.1875	43.75	17	10	
2 1/4	2.2500	47.50	17 1/2	10 1/2	
2 5/16	2.3125	52.50	17 1/2	10 3/4	
2 3/8	2.3750	60.00	18	10 5/8	
2 1/2	2.5000	70.00	19	11 3/4	
2 5/8	2.6250	83.50	19 1/2	12 1/8	
2 3/4	2.7500	95.00	20 1/2	13	
2 7/8	2.8750	110.00	21	13 1/2	
3	3.0000	125.00	22	14 3/4	

Sizes not listed furnished at price of next larger size listed.

"RELIANCE" HIGH SPEED TWIST DRILL

WITH STRAIGHT OR TAPER SHANKS



FIG. 3204

Diameter Inches	Price, Each	Length Over All, Inches	Morse Taper	Diameter Inches	Price, Each	Length Over All, Inches	Morse Taper
$\frac{1}{16}$	\$1.30	9	No. 2 Shank	$\frac{1}{8}$	\$5.80	13 $\frac{3}{4}$	No. 4 Shank
$\frac{3}{32}$	1.40	9 $\frac{1}{4}$		$\frac{1}{4}$	6.20	13 $\frac{7}{8}$	
$\frac{1}{8}$	1.40	9 $\frac{1}{4}$		$\frac{3}{16}$	6.20	13 $\frac{7}{8}$	
$\frac{9}{32}$	1.50	9 $\frac{1}{2}$		$\frac{1}{2}$	6.55	14	
$\frac{1}{4}$	1.50	9 $\frac{1}{2}$		$\frac{5}{16}$	6.55	14	
$\frac{5}{16}$	1.60	10 $\frac{3}{8}$		$\frac{3}{8}$	6.90	14 $\frac{1}{8}$	
$\frac{3}{8}$	1.60	10 $\frac{3}{8}$		$\frac{1}{2}$	6.90	14 $\frac{1}{8}$	
$\frac{7}{16}$	1.75	10 $\frac{1}{2}$		$\frac{5}{8}$	7.20	14 $\frac{1}{2}$	
$\frac{1}{2}$	1.75	10 $\frac{1}{2}$		$\frac{3}{4}$	7.20	14 $\frac{1}{2}$	
$\frac{9}{16}$	1.90	10 $\frac{3}{4}$		$\frac{7}{8}$	7.60	16 $\frac{3}{8}$	
$\frac{5}{8}$	1.90	10 $\frac{3}{4}$	No. 3 Shank	$\frac{1}{2}$	7.60	16 $\frac{3}{8}$	No. 5 Shank
$\frac{11}{16}$	2.05	10 $\frac{3}{4}$		$\frac{1}{2}$	8.00	16 $\frac{1}{2}$	
$\frac{3}{4}$	2.05	10 $\frac{3}{4}$		$\frac{5}{8}$	8.00	16 $\frac{1}{2}$	
$\frac{7}{8}$	2.25	11		$\frac{3}{4}$	8.40	16 $\frac{3}{4}$	
$\frac{15}{16}$	2.25	11		$\frac{7}{8}$	8.40	16 $\frac{3}{4}$	
$\frac{1}{2}$	2.40	11 $\frac{1}{4}$		$\frac{15}{16}$	8.80	17	
$\frac{3}{4}$	2.40	11 $\frac{1}{4}$		$1\frac{1}{16}$	8.80	17	
$\frac{5}{8}$	2.60	11 $\frac{3}{8}$		$\frac{1}{2}$	9.20	17 $\frac{1}{8}$	
$\frac{11}{16}$	2.60	11 $\frac{3}{8}$		$\frac{1}{2}$	9.20	17 $\frac{1}{8}$	
$\frac{3}{4}$	2.80	11 $\frac{1}{2}$		$\frac{1}{2}$	9.60	17 $\frac{1}{4}$	
$\frac{13}{16}$	2.80	11 $\frac{1}{2}$	No. 4 Shank	$\frac{1}{2}$	9.60	17 $\frac{1}{4}$	No. 5 Shank
$\frac{7}{8}$	3.00	11 $\frac{1}{2}$		$\frac{1}{2}$	10.00	17 $\frac{3}{8}$	
$\frac{15}{16}$	3.00	11 $\frac{1}{2}$		$\frac{1}{2}$	10.00	17 $\frac{3}{8}$	
$1\frac{1}{16}$	3.20	11 $\frac{3}{8}$		$\frac{1}{2}$	10.40	17 $\frac{1}{2}$	
$\frac{1}{2}$	3.20	11 $\frac{3}{8}$		$\frac{1}{2}$	10.40	17 $\frac{1}{2}$	
$\frac{1}{2}$	3.45	11 $\frac{3}{8}$		$\frac{1}{2}$	10.80	17 $\frac{3}{8}$	
$\frac{1}{2}$	3.45	11 $\frac{3}{8}$		$\frac{1}{2}$	10.80	17 $\frac{3}{8}$	
$\frac{1}{2}$	3.75	13		$\frac{1}{2}$	11.20	17 $\frac{3}{4}$	
$\frac{1}{2}$	3.75	13		$\frac{1}{2}$	11.20	17 $\frac{3}{4}$	
$\frac{1}{2}$	4.05	13		$\frac{1}{2}$	11.65	17 $\frac{3}{8}$	
$\frac{1}{2}$	4.05	13	No. 4 Shank	$\frac{1}{2}$	11.65	17 $\frac{3}{8}$	No. 5 Shank
$\frac{1}{2}$	4.35	13		$\frac{1}{2}$	12.10	18	
1	4.35	13		$\frac{1}{2}$	12.10	18	
$1\frac{1}{16}$	4.75	13 $\frac{1}{8}$		$\frac{1}{2}$	12.60	18 $\frac{1}{8}$	
$1\frac{1}{8}$	4.75	13 $\frac{1}{8}$		$\frac{1}{2}$	12.60	18 $\frac{1}{8}$	
$1\frac{1}{4}$	5.10	13 $\frac{1}{4}$		$\frac{1}{2}$	13.05	18 $\frac{1}{4}$	
$1\frac{1}{8}$	5.10	13 $\frac{1}{4}$		$\frac{1}{2}$	13.05	18 $\frac{1}{4}$	
$1\frac{1}{4}$	5.45	13 $\frac{1}{2}$		$\frac{1}{2}$	13.60	18 $\frac{3}{8}$	
$1\frac{1}{2}$	5.45	13 $\frac{1}{2}$		$\frac{1}{2}$	13.60	18 $\frac{3}{8}$	
$1\frac{3}{4}$	5.80	13 $\frac{3}{4}$		$\frac{1}{2}$	14.10	18 $\frac{3}{8}$	

"RELIANCE" HIGH SPEED TWIST DRILLS

WITH STRAIGHT OR TAPER SHANKS



FIG. 3205

Diameter Inches	Price, Each	Length Over All, Inches	Morse Taper	Diameter Inches	Price, Each	Length Over All, Inches	Morse Taper
1 3/4	\$14.10	18 3/8	No. 5 Shank	2 3/4	\$27.80	20 3/8	No. 5 Shank
1 1/2	14.55	18 3/8		2 1/2	27.80	20 3/8	
1 1/4	14.55	18 3/8		2 1/4	27.80	20 1/2	
1 3/8	15.00	18 1/2		2 3/8	27.80	20 1/2	
1 1/2	15.00	18 1/2		2 1/2	29.20	20 3/8	
1 1/4	15.50	18 1/2		2 1/4	29.20	20 3/8	
1 3/8	15.50	18 1/2		2 3/8	29.20	21	
1 1/2	16.00	18 5/8		2 1/2	29.20	21	
1 1/4	16.00	18 5/8		2 3/8	30.60	21 1/8	
1 3/8	16.55	18 5/8		2 1/2	30.60	21 1/8	
1 1/2	16.55	18 5/8		2 3/8	30.60	21 1/4	
1 3/8	17.10	18 3/4		2 1/2	30.60	21 1/4	
1 1/2	17.10	18 3/4		2 3/8	32.00	21 3/8	
1 3/8	17.65	18 3/4		2 1/2	32.00	21 3/8	
1 1/2	17.65	18 3/4		2 3/8	32.00	21 1/2	
1 3/8	18.20	18 3/4		2 1/2	32.00	21 1/2	
2	18.20	18 3/4		2 3/8	34.00	21 5/8	
2 1/4	19.50	18 7/8		2 1/2	34.00	21 5/8	
2 1/2	19.50	18 7/8		2 3/8	34.00	21 5/8	
2 3/4	19.50	19		2 1/2	34.00	21 3/4	
2 1/4	19.50	19		2 3/8	36.00	21 7/8	
2 3/8	20.80	19 1/4		2 1/2	36.00	21 7/8	
2 1/2	20.80	19 1/4		2 3/8	36.00	22	
2 3/4	20.80	19 1/4		2 1/2	36.00	22	
2 1/4	20.80	19 1/4		2 3/8	38.00	22 1/4	
2 3/8	22.20	19 3/8		2 1/2	38.00	22 1/4	
2 1/2	22.20	19 3/8		2 3/8	38.00	22 1/4	
2 3/4	22.20	19 1/2		2 1/2	40.00	22 3/8	
2 1/4	22.20	19 1/2		2 3/8	40.00	22 3/8	
2 3/8	23.60	19 5/8		2 1/2	40.00	22 1/2	
2 1/2	23.60	19 5/8		2 3/8	40.00	22 1/2	
2 3/4	23.60	19 3/4		2 1/2	42.50	22 3/4	
2 1/4	23.60	19 3/4		2 3/8	42.50	22 3/4	
2 3/8	25.00	19 7/8		2 1/2	42.50	22 5/8	
2 1/2	25.00	19 7/8		2 3/8	42.50	22 3/4	
2 3/4	25.00	20		2 1/2	42.50	22 3/4	
2 1/4	25.00	20		2 3/8	45.00	22 7/8	
2 3/8	26.40	20 1/8		2 1/2	45.00	22 7/8	
2 1/2	26.40	20 1/8		2 3/8	45.00	23	
2 3/4	26.40	20 1/4		2 1/2	45.00	23	
2 1/4	26.40	20 1/4		3	45.00	23	

BELL HANGERS' AND ELECTRICIANS' BITS

NO. 114E



FIG. 3206

The Numbers Indicate the Sizes in 32ds of an Inch

No.	12-INCH	18-INCH	24-INCH	30-INCH	36-INCH
	Dozen	Dozen	Dozen	Dozen	Dozen
6	\$ 7.50	\$10.00	\$12.50	\$15.00	\$17.50
8	8.00	10.50	13.00	15.50	18.00
10	8.75	11.00	13.50	16.00	18.50
12	9.50	12.00	14.50	17.00	19.50
14	10.50	13.00	15.50	18.00	20.50
16	12.00	14.50	17.00	19.50	22.00
18	13.50	16.00	18.50	21.00	23.50
20	15.25	17.75	20.25	22.75	25.25
22	17.00	19.50	22.00	24.50	27.00
24	19.00	21.50	24.00	26.50	29.00
26	21.00	23.50	26.00	28.50	31.00
28	23.00	25.50	28.00	30.50	33.00
30	25.00	27.50	30.00	32.50	35.00
32	27.50	30.00	32.50	35.50	38.00
34	30.50	33.00	35.50	39.00	42.00
36	33.00	36.00	39.00	42.50	47.00

CENTER DRILLS

NO. 125



FIG. 3207

Diameter, Inches	Price Per Dozen	Length Over All, Inches	Diameter, Inches	Price, Per Dozen	Length Over All, Inches
$\frac{1}{16}$	\$1.60	1	$\frac{1}{4}$	\$2.00	$1\frac{1}{2}$
$\frac{3}{32}$	1.65	1	$\frac{5}{16}$	2.25	$1\frac{1}{2}$
$\frac{1}{8}$	1.70	$1\frac{1}{4}$	$\frac{3}{8}$	2.50	$1\frac{1}{2}$
$\frac{5}{16}$	1.75	$1\frac{1}{4}$	$\frac{1}{2}$	2.75	$1\frac{1}{2}$
$\frac{3}{8}$	1.80	$1\frac{1}{4}$	$\frac{5}{8}$	3.00	$1\frac{1}{2}$
$\frac{7}{16}$	1.85	$1\frac{1}{4}$	$\frac{3}{4}$	3.25	$1\frac{1}{2}$
$\frac{1}{2}$	1.90	$1\frac{1}{2}$	$\frac{7}{8}$	3.50	$1\frac{1}{2}$

Always give list number when ordering.

DRILLS AND COUNTERSINKS COMBINED



FIG. 3208

CARBON STEEL NO. 98

HIGH SPEED STEEL NO. 498

The included angle of the Countersink is 60°. The drills at both ends are of the same diameter except in sizes Nos. 26 and 29. Special sizes or angles made to order.

Size	Price per Dozen		Diam. of Body Inches	Diam. of Drills Inches	Size	Price per Dozen		Diam. of Body Inches	Diam. of Drills Inches
	Carbon Steel	High Speed Steel				Carbon Steel	High Speed Steel		
20	\$2.00	\$6.00	1/4	No. 57	26	\$2.75	\$6.00	.302	3/8 & 1/2
21	2.25	6.00	1/4	No. 55	27	2.75	6.00	.302	1/2
22	2.25	6.00	1/4	1/16	28	3.50	9.00	1/2	3/4
23	2.50	6.00	1/4	No. 49	29	3.50	9.00	1/2	1/2 & 3/4
24	2.50	6.00	1/4	No. 45	30	3.50	9.00	1/2	1/2
25	2.75	6.00	.302	3/8					

Set No. 19 is composed of Drills and Countersinks List No. 98, sizes 20, 22, 23, 24, 25, 27, 28, 30. This range of sizes will be found ample to cover the center hole requirements of almost every shop. The set is packed in a neat wooden box with an individual hole for each tool to avoid misplacement and to permit quick selection.

Price complete\$2.00



FIG. 3209

CARBON STEEL NO. 98-A

HIGH SPEED STEEL NO. 498-A

Bodies 1/2 inch or .648 inch (5/8 inch) diameter flattened

Size	Price per Dozen		Diam. of Body Inches	Diam. of Drills Inches	Size	Price per Dozen		Diam. of Body Inches	Diam. of Drills Inches
	Carbon Steel	High Speed Steel				Carbon Steel	High Speed Steel		
00	\$4.60	\$12.00	1/2	3/8 & 1/2	5	\$7.25	\$18.00	.648	7/8
1	4.60	12.00	1/2	3/4	6	7.25	18.00	.648	3/2
2	4.60	12.00	1/2	3/2	7	7.75	18.00	.648	1 1/2
3	5.00	12.00	1/2	1 1/2	8	7.75	18.00	.648	1 3/4
4	5.00	12.00	1/2	1 3/4					

These Drills and Countersinks are specially designed for drilling and countersinking tires and wagon irons at one operation. They are made of highest grade tool steel specially tempered.

BIT STOCK COUNTERSINKS
NO. 115

FIG. 3210

Diameter, Inches	Price, Each	Length Over All, Inches	Diameter, Inches	Price, Each	Length Over All, Inches
3/4	\$0.50	4 1/4	3/4	\$0.90	5
7/8	.60	4 1/4	7/8	1.05	5
1/2	.75	4 1/4	1	1.20	5

The included angle at point is 82 degrees. Special angles to order.

NEW YANKEE DRILL GRINDERS

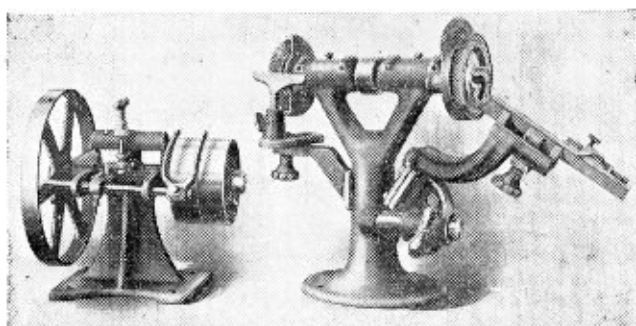


FIG. 3211

STYLE KPT.

Capacity drills	inches	3/32 to 1 1/4
Diameter of emery wheel.....	"	7
Speed of emery wheel.....	R. P. M.	2640
Speed of countershaft.....	R. P. M.	550
Pulley on wheel spindle.....	inches	2 1/2 x 1 1/4
Driving pulley	"	12 x 1 1/4
Tight and loose pulleys.....	"	6 x 1 3/4
Height to center of spindle.....	"	14
Bench space occupied	square feet	1
Weight, net	pounds	100
Weight, crated	"	130
Weight, boxed	"	150
Cubic feet, boxed.....	"	5
Price	each	\$68.00

STYLE LPT.

Capacity drills	inches	.52 to 5/8
Diameter of emery wheel.....	"	5
Speed of emery wheel.....	R. P. M.	2880
Speed of countershaft	R. P. M.	600
Pulley on wheel spindle.....	inches	2 1/2 x 1 1/4
Driving pulley	"	12 x 1 1/4
Tight and loose pulleys.....	"	6 x 1 3/4
Height to center of spindle.....	"	14
Bench space occupied	square feet	1
Weight, net	pounds	95
Weight, crated	"	115
Weight, boxed	"	135
Cubic feet, boxed	"	4 1/2
Price	each	\$65.00

NEW YANKEE DRILL GRINDERS

Style BPT

No. "O" Universal

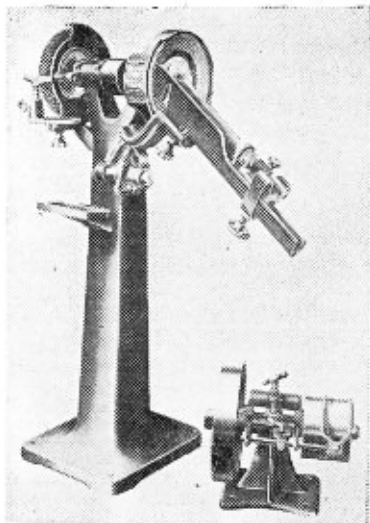


FIG. 3212

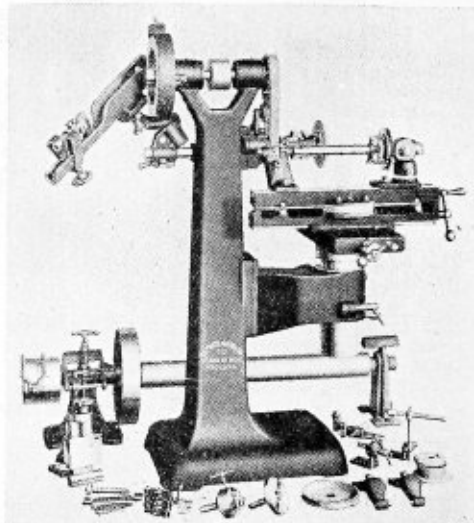


FIG. 3213

Style	BPT	No. "O"
Capacity drills .....inches	$\frac{1}{4}$ to $2\frac{1}{4}$	$\frac{1}{4}$ to $2\frac{1}{4}$
Diameter of emery wheel.....inches	9 $\frac{1}{2}$	9 $\frac{1}{2}$
Speed of emery wheel.....R. P. M.	1600	1600
Speed of countershaft.....R. P. M.	530	530
Pulley on wheel spindle.....inches	4x2 $\frac{1}{4}$	4x2 $\frac{1}{4}$
Driving pulley .....inches	12x2 $\frac{1}{4}$	12x2 $\frac{1}{4}$
Tight and loose pulleys.....inches	6x2 $\frac{1}{4}$	6x2 $\frac{1}{4}$
Height to center of spindle.....inches	42	42
Weight, net .....pounds	230	620
Weight, crated .....pounds	265	725
Weight, boxed .....pounds	325	850
Cubic feet, boxed .....feet	13	30
Price .....each	\$89.00	\$400.00

The No. "O" machine is adapted to small shops where the limited number and range of sizes of milling cutters and reamers does not warrant the installation of a higher priced machine. Longitudinal feed 12 in., cross feed 6 in., vertical feed 6 in.

W & M. No. 1 UNIVERSAL GRINDER

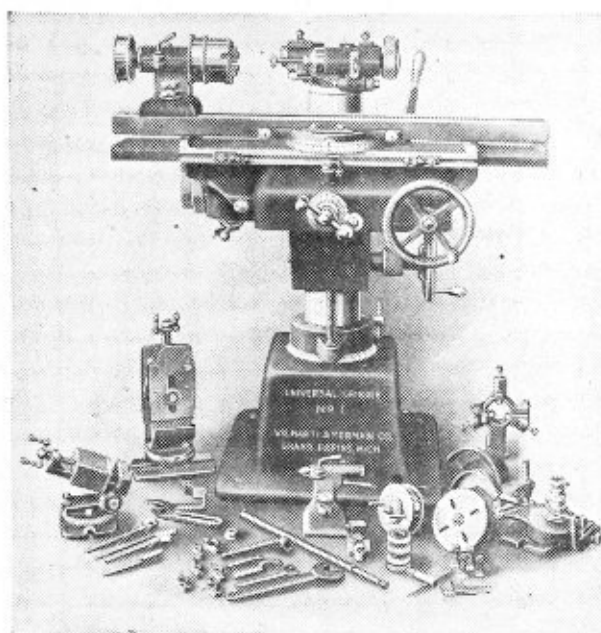


FIG. 3214

SPECIFICATIONS

Longitudinal movement of table, 22 inches.

Vertical movement of table, 11 inches.

Transverse movement of table, 8 inches.

Centers swing work up to 10 inches diameter.

Centers swing work up to 30 inches long.

Working surface of table, $5\frac{1}{2}$ inches by 42 inches.

Vise opens $2\frac{3}{8}$ inches. (Hardened jaws may be temporarily removed, increasing this $\frac{3}{4}$ inch.)

Vise jaws $4\frac{1}{8}$ inches wide, $1\frac{1}{8}$ inches deep.

Universal attachment swings cutter 16 inches diameter over table, 24 inches diameter over subtable.

Internal grinding attachment grinds from $\frac{7}{8}$ inch up, 3 inches deep, from $1\frac{1}{4}$ inches up, 5 inches deep.

Capacity of gear cutting attachment from $1\frac{3}{4}$ inches to $8\frac{1}{2}$ inches diameter, (120 pitch to 1 pitch.)

Size of chuck, 4 inches.

Capacity of steady rest, $2\frac{1}{4}$ inches diameter.

Net weight complete with attachments about 1,300 pounds.

Crated weight 1,500 pounds, boxed weight 1,600 pounds.

Prices on application.

STANDARD TAPER PINS

PRICE PER FOOT

[illegible]

FIG. 3215

Taper $\frac{1}{4}$ inch to the foot. In ordering sizes other than those included in the above list, furnish the length and the size at the larger end.

FINISHED MACHINE KEYS

Price per 100, Square Keys with Heads.

DIMENSIONS IMMEDIATELY UNDER HEAD IN INCHES

Always specify on order length, width and thickness at large end and give taper.



FIG. 3216

[illegible]

STANDARD HAND REAMERS



FIG. 3217

No. 128A CARBON STEEL

No. 624 HIGH SPEED STEEL

Diameter, Inches	Price, Each		Length Over All, Inches	Length of Flute, Inches	Diameter, Inches	Price, Each		Length Over All, Inches	Length of Flute, Inches
	Carbon Steel	High Speed				Carbon Steel	High Speed		
1/8	\$1.00	\$3.00	3	1 1/2	1 11/32	\$5.40	\$18.75	12 17/32	6 17/64
5/32	1.10	3.25	3 1/4	1 5/8	1 1/8	5.60	18.75	12 5/8	6 5/16
3/16	1.20	3.25	3 1/2	1 3/4	1 13/32	5.80	20.50	12 23/32	6 23/64
7/32	1.30	3.50	3 3/4	1 7/8	1 1/4	6.00	20.50	12 13/16	6 13/32
1/4	1.40	3.50	4	2	1 15/32	6.20	22.25	12 29/32	6 29/64
9/32	1.45	3.75	4 1/4	2 1/8	1 1/2	6.40	22.25	13	6 1/2
5/16	1.50	3.75	4 1/2	2 1/4	1 17/32	6.60	24.00	13	6 1/4
11/32	1.55	4.25	4 3/4	2 3/8	1 3/4	6.80	24.00	13	6 1/2
3/8	1.60	4.25	5	2 1/2	1 19/32	7.00	25.75	13	6 1/2
13/32	1.70	4.75	5 1/4	2 5/8	1 5/8	7.20	25.75	13	6 1/2
7/16	1.75	4.75	5 1/2	2 3/4	1 21/32	7.40	27.50	13 1/2	6 3/4
15/32	1.85	5.25	5 3/4	2 7/8	1 1/2	7.60	27.50	13 1/2	6 3/4
1/2	1.90	5.25	6	3	1 23/32	7.80	29.50	13 1/2	6 3/4
17/32	1.95	5.75	6 1/4	3 1/8	1 3/4	8.00	29.50	13 1/2	6 3/4
9/16	2.00	5.75	6 1/2	3 1/4	1 25/32	8.20	31.50	13 1/2	6 3/4
19/32	2.10	6.25	6 3/4	3 3/8	1 1/2	8.40	31.50	13 1/2	6 3/4
5/8	2.20	6.25	7	3 1/2	1 27/32	8.60	33.50	13 1/2	6 3/4
21/32	2.30	6.75	7 11/32	3 43/64	1 7/8	8.80	33.50	14	7
11/16	2.40	6.75	7 11/16	3 27/32	1 29/32	9.00	35.75	14	7
23/32	2.50	7.25	8 1/8	4 1/16	1 1/2	9.20	35.75	14	7
3/4	2.60	7.25	8 3/8	4 3/16	1 31/32	9.40	38.00	14	7
25/32	2.70	7.75	8 23/32	4 23/64	2	9.60	38.00	14	7
13/16	2.80	7.75	9 1/16	4 17/32	2 1/16	10.00	40.75	14 1/2	7 1/4
27/32	2.95	8.50	9 3/8	4 11/16	2 1/8	10.40	43.50	14 1/2	7 1/4
7/8	3.10	8.50	9 11/16	4 27/32	2 1/4	10.80	46.25	15	7 1/2
29/32	3.25	9.50	10 3/32	5 3/64	2 1/2	11.30	49.00	15	7 1/2
15/16	3.40	9.50	10 1/4	5 1/8	2 3/8	11.80	51.75	15	7 1/2
31/32	3.55	10.50	10 11/16	5 11/32	2 3/4	12.30	55.00	15	7 1/2
1	3.70	10.50	10 5/8	5 7/16	2 5/8	12.80	58.25	15 1/2	7 3/4
1 1/32	3.85	11.50	11 1/16	5 17/32	2 1/2	13.40	61.50	15 1/2	7 3/4
1 1/16	4.00	11.50	11 1/4	5 5/8	2 5/8	14.00	64.75	15 1/2	7 3/4
1 3/32	4.15	12.75	11 7/16	5 23/32	2 3/4	14.00	68.00	16	8
1 1/8	4.30	12.75	11 5/8	5 13/16	2 1/2	15.40	71.25	16	8
1 5/32	4.45	14.25	11 13/16	5 29/32	2 3/4	16.20	74.50	16	8
1 1/4	4.60	14.25	12	6	2 1/2	17.00	77.75	16 1/2	8 1/4
1 7/32	4.75	15.75	12 1/4	6 1/16	2 3/8	17.80	81.00	16 1/2	8 1/4
1 1/2	4.90	15.75	12 1/2	6 1/4	2 1/2	18.60	84.25	16 1/2	8 1/4
1 9/32	5.05	17.25	12 11/32	6 11/64	3	19.40	87.50	16 1/2	8 1/4
1 5/16	5.20	17.25	12 7/16	6 7/32					

Sixty-fourth sizes between 1/8 inch and 1/2 inch take list of next larger 32nd size. All sizes and dimensions not listed are special and subject to special prices.

Always Give List Number When Ordering.

TAPER SHANK JOBBERS' REAMERS



FIG. 3218

ECCENTRIC FLUTES

CARBON STEEL NO. 128-B

HIGH SPEED STEEL NO. 628

Diameter Inches	Price Each		Length of Flute Inches	Length Over all Inches	Shank Taper	Diameter Inches	Price Each		Length of Flute Inches	Length Over all Inches	Shank Taper
	Carbon Steel	High Speed					Carbon Steel	High Speed			
$\frac{1}{4}$	\$1.70	\$4.00	2	$5\frac{1}{8}$	No. 1	1	\$4.45	\$11.50	$5\frac{1}{8}$	10 $\frac{3}{8}$	No. 2
$\frac{3}{16}$	1.75	4.25	2	$5\frac{1}{8}$		$1\frac{1}{16}$	4.60	12.50	$5\frac{1}{8}$	10 $\frac{3}{8}$	
$\frac{1}{8}$	1.75	4.25	2	$5\frac{1}{8}$		$1\frac{1}{8}$	4.80	12.50	$5\frac{1}{8}$	10 $\frac{3}{8}$	
$\frac{5}{16}$	1.80	4.25	$2\frac{1}{4}$	$5\frac{1}{2}$		$1\frac{3}{16}$	5.00	13.75	$5\frac{1}{8}$	10 $\frac{3}{8}$	
$\frac{3}{8}$	1.80	4.25	$2\frac{1}{4}$	$5\frac{1}{2}$		$1\frac{1}{2}$	5.15	13.75	$5\frac{1}{8}$	10 $\frac{3}{8}$	
$\frac{7}{16}$	1.85	4.75	$2\frac{3}{4}$	$5\frac{1}{2}$		$1\frac{5}{8}$	5.35	15.25	$5\frac{1}{8}$	10 $\frac{3}{8}$	
$\frac{1}{2}$	1.85	4.75	$2\frac{3}{4}$	$5\frac{1}{2}$		$1\frac{3}{4}$	5.50	15.25	6	11 $\frac{1}{8}$	
$\frac{9}{16}$	1.90	4.75	$2\frac{1}{2}$	$5\frac{1}{8}$		$1\frac{7}{8}$	5.70	16.75	6	11 $\frac{1}{8}$	
$\frac{5}{8}$	1.90	4.75	$2\frac{1}{2}$	$5\frac{1}{8}$		$1\frac{15}{16}$	5.90	16.75	$6\frac{1}{8}$	12 $\frac{1}{2}$	
$\frac{11}{16}$	2.05	5.25	$2\frac{1}{2}$	$5\frac{1}{8}$		$1\frac{1}{2}$	6.05	18.25	$6\frac{1}{8}$	12 $\frac{1}{2}$	
$\frac{3}{4}$	2.05	5.25	$2\frac{1}{2}$	$5\frac{1}{8}$		$1\frac{3}{4}$	6.25	18.25	$6\frac{1}{8}$	12 $\frac{1}{2}$	
$\frac{13}{16}$	2.15	5.25	$2\frac{3}{4}$	$6\frac{1}{8}$		$1\frac{7}{8}$	6.50	19.75	$6\frac{1}{8}$	12 $\frac{1}{2}$	
$\frac{7}{8}$	2.15	5.25	$2\frac{3}{4}$	$6\frac{1}{8}$		$1\frac{15}{16}$	6.70	19.75	$6\frac{1}{8}$	12 $\frac{1}{2}$	
$\frac{15}{16}$	2.20	5.75	$2\frac{3}{4}$	$6\frac{1}{8}$		$1\frac{1}{2}$	6.95	21.50	$6\frac{1}{8}$	12 $\frac{1}{2}$	
$\frac{17}{16}$	2.20	5.75	$2\frac{3}{4}$	$6\frac{1}{8}$		$1\frac{3}{4}$	7.20	21.50	$6\frac{1}{8}$	13	
$\frac{19}{16}$	2.30	5.75	3	$6\frac{7}{8}$	No. 2	$1\frac{1}{2}$	7.45	23.25	$6\frac{1}{8}$	13	No. 4
$\frac{11}{8}$	2.30	5.75	3	$6\frac{7}{8}$		$1\frac{1}{4}$	7.70	23.25	$6\frac{1}{8}$	13 $\frac{1}{2}$	
$\frac{13}{8}$	2.35	6.25	3	$6\frac{7}{8}$		$1\frac{1}{8}$	7.90	25.00	$6\frac{1}{2}$	13 $\frac{1}{2}$	
$\frac{15}{8}$	2.40	6.25	$3\frac{1}{4}$	$6\frac{3}{4}$		$1\frac{1}{16}$	8.15	25.00	$6\frac{1}{2}$	13 $\frac{1}{2}$	
$\frac{17}{8}$	2.50	6.75	$3\frac{1}{4}$	$6\frac{3}{4}$		$1\frac{1}{8}$	8.40	26.75	$6\frac{1}{2}$	13 $\frac{1}{2}$	
$\frac{19}{8}$	2.65	6.75	$3\frac{1}{2}$	$7\frac{1}{8}$		$1\frac{1}{4}$	8.65	26.75	$6\frac{1}{2}$	13 $\frac{1}{2}$	
$\frac{21}{8}$	2.75	7.25	$3\frac{1}{2}$	$7\frac{1}{8}$		$1\frac{1}{8}$	8.90	28.50	$6\frac{1}{2}$	13 $\frac{1}{2}$	
$\frac{23}{8}$	2.90	7.25	$3\frac{3}{8}$	8		$1\frac{1}{16}$	9.10	28.50	$6\frac{3}{4}$	13 $\frac{3}{4}$	
$\frac{25}{8}$	3.00	7.75	$3\frac{3}{8}$	8		$1\frac{1}{8}$	9.35	30.50	$6\frac{3}{4}$	13 $\frac{3}{4}$	
$\frac{27}{8}$	3.10	7.75	$4\frac{1}{8}$	$8\frac{3}{8}$		$1\frac{1}{4}$	9.60	30.50	$6\frac{3}{4}$	14 $\frac{1}{8}$	No. 5
$\frac{29}{8}$	3.25	8.50	$4\frac{1}{8}$	$8\frac{3}{8}$		$1\frac{1}{8}$	9.85	32.50	$6\frac{3}{4}$	14 $\frac{1}{8}$	
$\frac{31}{8}$	3.35	8.50	$4\frac{1}{8}$	$8\frac{1}{2}$		$1\frac{1}{16}$	10.10	32.50	$6\frac{3}{4}$	14 $\frac{1}{8}$	
$\frac{33}{8}$	3.55	9.50	$4\frac{1}{8}$	$8\frac{1}{2}$		$1\frac{1}{8}$	10.30	34.50	$6\frac{3}{4}$	14 $\frac{1}{8}$	
$\frac{35}{8}$	3.70	9.50	$4\frac{3}{8}$	$9\frac{1}{8}$		$1\frac{1}{4}$	10.55	34.50	7	15	
$\frac{37}{8}$	3.90	10.50	$4\frac{3}{8}$	$9\frac{1}{8}$		$1\frac{1}{8}$	10.80	36.75	7	15	
$\frac{39}{8}$	4.10	10.50	$5\frac{1}{8}$	10	No. 3	$1\frac{1}{16}$	11.05	36.75	7	15	
$\frac{41}{8}$	4.25	11.50	$5\frac{1}{8}$	10		$1\frac{1}{8}$	11.30	39.00	7	15	
$\frac{43}{8}$						2	11.50	39.00	7	15	

High Speed Reamers No. 628 are not carried in stock regularly.

Reamers for brass or bronze require special clearance and are so furnished on request.

All sizes and dimensions not listed are special and subject to special prices.

SELF-FEEDING REAMERS

(ECCENTRIC FLUTES)

CARBON STEEL NO. 128

HIGH SPEED STEEL NO. 626



FIG. 3219

Diameter Inches	Price Each		Length of Flute Inches	Length Over All Inches	Diameter Inches	Price Each		Length of Flute Inches	Length Over All Inches
	Carbon Steel	High Speed				Carbon Steel	High Speed		
1/4	\$1.55	\$3.50	2	4	1 1/2	\$5.55	\$17.25	6 1/2	12 1/2
1/2	1.60	3.75	2 1/8	4 1/4	1 5/8	5.70	17.25	6 3/4	12 3/4
3/4	1.60	3.75	2 1/8	4 1/4	1 3/4	5.95	18.75	6 3/4	12 3/4
1	1.65	3.75	2 1/4	4 1/2	1 7/8	6.15	18.75	6 3/4	12 3/4
1 1/4	1.65	3.75	2 1/4	4 1/2	1 7/8	6.40	20.50	6 3/4	12 3/4
1 1/2	1.70	4.25	2 3/8	4 3/4	1 7/8	6.60	20.50	6 3/4	12 3/4
1 3/4	1.70	4.25	2 3/8	4 3/4	1 7/8	6.80	22.25	6 3/4	12 3/4
2	1.75	4.25	2 1/2	5	1 7/8	7.05	22.25	6 1/2	13
2 1/4	1.75	4.25	2 1/2	5	1 7/8	7.25	24.00	6 1/2	13
2 1/2	1.85	4.75	2 5/8	5 1/4	1 7/8	7.50	24.00	6 1/2	13
2 3/4	1.85	4.75	2 5/8	5 1/4	1 7/8	7.70	25.75	6 1/2	13
3	1.95	4.75	2 3/4	5 1/2	1 7/8	7.90	25.75	6 1/2	13
3 1/4	1.95	4.75	2 3/4	5 1/2	1 7/8	8.15	27.50	6 3/4	13 1/2
3 1/2	2.05	5.25	2 7/8	5 3/4	1 7/8	8.35	27.50	6 3/4	13 1/2
3 3/4	2.05	5.25	2 7/8	5 3/4	1 7/8	8.60	29.50	6 3/4	13 1/2
4	2.10	5.25	3	6	1 7/8	8.80	29.50	6 3/4	13 1/2
4 1/4	2.10	5.25	3	6	1 7/8	9.00	31.50	6 3/4	13 1/2
4 1/2	2.15	5.75	3 1/8	6 1/4	1 7/8	9.25	31.50	6 3/4	13 1/2
4 3/4	2.20	5.75	3 1/4	6 1/2	1 7/8	9.45	33.50	6 3/4	13 1/2
5	2.30	6.25	3 3/8	6 3/4	1 7/8	9.70	33.50	7	14
5 1/4	2.40	6.25	3 1/2	7	1 7/8	9.90	35.75	7	14
5 1/2	2.55	6.75	3 3/4	7 1/4	1 7/8	10.10	35.75	7	14
5 3/4	2.65	6.75	3 3/4	7 1/4	1 7/8	10.35	38.00	7	14
6	2.75	7.25	4 1/8	8 1/8	2	10.55	38.00	7	14
6 1/4	2.85	7.25	4 1/8	8 3/8	2 1/8	11.00	40.75	7 1/4	14 1/2
6 1/2	3.00	7.75	4 1/2	8 3/4	2 1/8	11.45	43.50	7 1/4	14 1/2
6 3/4	3.10	7.75	4 1/2	9 1/8	2 1/8	11.90	46.25	7 1/2	15
7	3.25	8.50	4 1/2	9 3/8	2 1/8	12.45	49.00	7 1/2	15
7 1/4	3.40	8.50	4 1/2	9 1/2	2 1/8	13.00	51.75	7 1/2	15
7 1/2	3.60	9.50	5 1/8	10 3/8	2 3/8	13.55	55.00	7 1/2	15
7 3/4	3.75	9.50	5 1/8	10 1/4	2 3/8	14.10	58.25	7 3/4	15 1/2
8	3.90	10.50	5 1/8	10 1/2	2 3/8	14.75	61.50	7 3/4	15 1/2
8 1/4	4.05	10.50	5 1/8	10 3/4	2 3/8	15.40	64.75	7 3/4	15 1/2
8 1/2	4.25	11.50	5 1/2	11 1/8	2 3/8	16.05	68.00	8	16
8 3/4	4.40	11.50	5 1/2	11 1/4	2 3/8	16.95	71.25	8	16
9	4.55	12.75	5 3/8	11 3/8	2 3/8	17.80	74.50	8	16
9 1/4	4.75	12.75	5 3/8	11 3/4	2 3/8	18.70	77.75	8 1/4	16 1/2
9 1/2	4.90	14.25	5 3/8	11 1/2	2 3/8	19.60	81.00	8 1/4	16 1/2
9 3/4	5.05	14.25	6	12	2 3/8	20.45	84.25	8 1/4	16 1/2
10	5.25	15.75	6 1/8	12 1/4	3	21.35	87.50	8 1/4	16 1/2
10 1/4	5.40	15.75	6 1/8	12 1/4					

ROSE CHUCKING REAMERS

WITH TAPER SHANKS

CARBON STEEL NO. 151

HIGH SPEED STEEL NO. 636



FIG. 3220

Diameter Inches	Price Each		Length of Flute Inches	Length Over All Inches	Shank Taper
	Carbon Steel	High Speed			
$\frac{1}{4}$	\$1.45	\$3.50	$1\frac{1}{2}$	6	No. 1
$\frac{5}{16}$	1.55	3.75	$1\frac{1}{2}$	6	
$\frac{3}{8}$	1.55	3.75	$1\frac{1}{2}$	6	
$\frac{7}{16}$	1.75	4.25	$1\frac{1}{2}$	6	
$\frac{1}{2}$	1.75	4.25	$1\frac{3}{4}$	7	
$\frac{9}{16}$	1.90	4.75	$1\frac{3}{4}$	7	
$\frac{5}{8}$	1.90	4.75	$1\frac{3}{4}$	7	
$\frac{11}{16}$	2.15	5.25	$1\frac{3}{4}$	7	
$\frac{3}{4}$	2.15	5.25	2	8	
$\frac{7}{8}$	2.40	5.75	2	8	
$\frac{1}{2}$	2.40	5.75	2	8	
$\frac{1}{2}$	2.70	6.25	2	8	
$\frac{5}{8}$	2.70	6.25	$2\frac{1}{4}$	9	No. 2
$\frac{11}{16}$	2.90	6.75	$2\frac{1}{4}$	9	
$\frac{3}{4}$	2.90	6.75	$2\frac{1}{4}$	9	
$\frac{7}{8}$	3.05	7.25	$2\frac{1}{4}$	9	
$\frac{1}{2}$	3.05	7.25	$2\frac{1}{2}$	$9\frac{1}{2}$	
$\frac{1}{2}$	3.35	8.00	$2\frac{1}{2}$	$9\frac{1}{2}$	
$\frac{1}{2}$	3.35	8.00	$2\frac{1}{2}$	$9\frac{1}{2}$	
$\frac{1}{2}$	3.60	9.00	$2\frac{1}{2}$	$9\frac{1}{2}$	
$\frac{1}{2}$	3.60	9.00	$2\frac{3}{4}$	10	
$\frac{1}{2}$	3.90	10.00	$2\frac{3}{4}$	10	
$\frac{1}{2}$	3.90	10.00	$2\frac{3}{4}$	10	
$\frac{1}{2}$	4.15	11.00	$2\frac{3}{4}$	10	No. 3
1	4.15	11.00	$2\frac{3}{4}$	$10\frac{1}{2}$	
$1\frac{1}{16}$	4.45	12.25	$2\frac{3}{4}$	$10\frac{1}{2}$	
$1\frac{1}{8}$	4.45	12.25	$2\frac{3}{4}$	$10\frac{1}{2}$	
$1\frac{1}{4}$	4.70	13.50	$2\frac{3}{4}$	$10\frac{1}{2}$	
$1\frac{1}{2}$	4.70	13.50	$2\frac{3}{4}$	11	
$1\frac{3}{8}$	5.00	14.75	$2\frac{3}{4}$	11	
$1\frac{1}{2}$	5.00	14.75	$2\frac{3}{4}$	11	
$1\frac{3}{4}$	5.20	16.25	$2\frac{3}{4}$	11	
$1\frac{1}{4}$	5.20	16.25	3	$11\frac{1}{2}$	No. 4
$1\frac{1}{2}$	5.50	18.00	3	$11\frac{1}{2}$	
$1\frac{3}{8}$	5.75	19.75	$3\frac{1}{4}$	12	
$1\frac{1}{2}$	6.05	21.50	$3\frac{1}{4}$	12	
$1\frac{1}{2}$	6.30	23.25	$3\frac{1}{2}$	$12\frac{1}{2}$	
$1\frac{3}{4}$	6.60	25.00	$3\frac{1}{2}$	$12\frac{1}{2}$	
$1\frac{5}{8}$	6.90	26.75	$3\frac{3}{4}$	13	
$1\frac{1}{2}$	7.20	28.50	$3\frac{3}{4}$	13	
$1\frac{3}{4}$	7.55	30.50	4	$13\frac{1}{2}$	No. 5
$1\frac{1}{2}$	7.90	32.50	4	$13\frac{1}{2}$	
$1\frac{1}{2}$	8.30	34.50	$4\frac{1}{4}$	14	
$1\frac{1}{2}$	8.65	36.75	$4\frac{1}{4}$	14	
2	9.00	39.00	$4\frac{1}{4}$	14	

ROSE CHUCKING REAMERS CARBON STEEL NO. 136 HIGH SPEED STEEL NO. 634



FIG. 3221

Diam. Inches	Price Each		Length of Flute Inches	Length Over All Inches	Diam. Inches	Price Each		Length of Flute Inches	Length Over All Inches
	Carbon Steel	High Speed				Carbon Steel	High Speed		
1/8	\$0.90	\$2.00	7/8	3 3/4	3/8	\$3.25	\$9.00	2 5/8	10
3/16	.95	2.25	1 1/4	5	1/2	3.25	9.00	2 5/8	10
1/4	1.00	2.50	1 1/4	5	5/8	3.45	10.00	2 5/8	10
5/16	1.10	2.75	1 1/4	5	1	3.45	10.00	2 3/4	10 1/2
3/8	1.20	3.00	1 1/2	6	1 1/8	3.70	11.25	2 3/4	10 1/2
7/16	1.30	3.25	1 1/2	6	1 1/4	3.70	11.25	2 3/4	10 1/2
1/2	1.30	3.25	1 1/2	6	1 3/8	3.90	12.50	2 3/4	10 1/2
9/16	1.45	3.75	1 1/2	6	1 1/2	3.90	12.50	2 7/8	11
5/8	1.45	3.75	1 3/4	7	1 5/8	4.15	13.75	2 7/8	11
3/4	1.60	4.25	1 3/4	7	1 3/4	4.15	13.75	2 7/8	11
7/8	1.60	4.25	1 3/4	7	1 7/8	4.35	15.25	2 7/8	11
1	1.80	4.75	1 3/4	7	1 1/2	4.35	15.25	3	11 1/2
1 1/8	1.80	4.75	2	8	1 5/8	4.60	17.00	3	11 1/2
1 1/4	2.00	5.25	2	8	1 3/4	4.80	18.75	3 1/4	12
1 1/2	2.00	5.25	2	8	1 7/8	5.05	20.50	3 1/4	12
1 3/4	2.25	5.75	2	8	1 1/2	5.25	22.25	3 1/2	12 1/2
2	2.25	5.75	2 1/4	9	1 5/8	5.50	24.00	3 1/2	12 1/2
2 1/8	2.40	6.25	2 1/4	9	1 3/4	5.75	25.75	3 3/4	13
2 1/4	2.40	6.25	2 1/4	9	1 7/8	6.00	27.50	3 3/4	13
2 1/2	2.55	6.75	2 1/4	9	1 3/4	6.30	29.50	4	13 1/2
2 3/4	2.55	6.75	2 1/2	9 1/2	1 11/8	6.60	31.50	4	13 1/2
3	2.80	7.25	2 1/2	9 1/2	1 3/4	6.90	33.50	4 1/4	14
3 1/8	2.80	7.25	2 1/2	9 1/2	1 1/2	7.20	35.75	4 1/4	14
3 1/4	3.00	8.00	2 1/2	9 1/2	2	7.50	38.00	4 1/4	14
3 1/2	3.00	8.00	2 5/8	10					

All sizes and dimensions not listed are special and subject to special prices.

TAPER SOCKET REAMERS FINISHING REAMERS—NO. 144



FIG. 3222

Number of Taper	Price Each		Length of Flute, Inches	Length Over All, Inches	Diameters at	
	Finishing	Roughing			Large End, Inches	Small End, Inches
0	\$ 1.60	\$ 1.90	2 1/4	3 3/4	.369	.252
1	2.00	2.40	3	5 1/2	.519	.369
2	2.60	3.10	3 1/2	7	.748	.572
3	3.40	4.10	4 1/4	8	.991	.778
4	4.20	5.05	5 1/4	9	1.293	1.020
5	6.60	7.90	6 1/4	10	1.803	1.475
6	12.00	14.40	8 1/2	12	2.559	2.116
7	35.00	42.00	12	16	3.375	2.750

CENTER REAMERS

NO. 125A—NO. 1



FIG. 3223

NO. 125A—NO. 2



FIG. 3224

Diameter Shank Inches		Diameter Body Inches	Price—No. 1		Price—No. 2	
			Dozen	Each	Dozen	Each
$\frac{3}{16}$	X	$\frac{1}{4}$	\$3.60	\$0.30	\$3.00	\$0.25
$\frac{1}{4}$	X	$\frac{3}{8}$	4.20	.35	3.60	.30
$\frac{3}{8}$	X	$\frac{1}{2}$	4.80	.40	4.20	.35
$\frac{1}{2}$	X	$\frac{5}{8}$	7.80	.65	7.20	.60
$\frac{1}{2}$	X	$\frac{3}{4}$	10.20	.85	9.60	.80

Special sizes made to order. The included angle is 60° unless otherwise ordered. Center Reamers with 72° or 82° included angle will be furnished at regular price. In ordering, give diameter of both shank and body.

LOCOMOTIVE TAPER REAMERS

CARBON STEEL NO. 141—HIGH SPEED STEEL NO. 638



FIG. 3225

Taper $\frac{1}{16}$ inch per foot. Adopted generally by the railroad companies.

Diam. at End, Inches	Carbon Steel, Each	High Speed, Each	Length of Flute, Inches	Total Length, Inches	Diam. at End, Inches	Carbon Steel, Each	High Speed, Each	Length of Flute, Inches	Total Length, Inches
$\frac{1}{4}$	\$2.20	\$5.00	4	5 $\frac{5}{8}$	$\frac{1}{8}$	\$5.70	\$14.50	9	11 $\frac{1}{4}$
$\frac{9}{16}$	2.20	5.20	4	5 $\frac{5}{8}$	$\frac{1}{8}$	6.20	16.00	10	12 $\frac{1}{4}$
$\frac{1}{2}$	2.25	5.40	4	5 $\frac{5}{8}$	$\frac{1}{8}$	6.60	17.50	10	12 $\frac{3}{4}$
$\frac{11}{16}$	2.25	5.60	4	5 $\frac{5}{8}$	$\frac{1}{4}$	7.00	19.00	10	12 $\frac{3}{4}$
$\frac{3}{4}$	2.30	5.80	5	6 $\frac{1}{8}$	$\frac{1}{8}$	7.60	20.75	12	14 $\frac{1}{2}$
$\frac{13}{16}$	2.40	6.00	5	6 $\frac{1}{8}$	$\frac{1}{8}$	8.00	22.50	12	14 $\frac{3}{4}$
$\frac{7}{8}$	2.55	6.20	6	7 $\frac{1}{8}$	$\frac{1}{8}$	8.50	24.50	12	14 $\frac{3}{4}$
$\frac{15}{16}$	2.70	6.40	6	7 $\frac{1}{8}$	$\frac{1}{2}$	9.00	26.50	12	14 $\frac{3}{4}$
$\frac{1}{2}$	3.00	6.60	7	8 $\frac{5}{8}$	$\frac{1}{8}$	9.60	29.00	14	16 $\frac{1}{2}$
$\frac{1}{2}$	3.20	7.10	8	9 $\frac{3}{8}$	$\frac{1}{8}$	10.20	31.50	14	16 $\frac{1}{2}$
$\frac{5}{8}$	3.50	7.60	8	9 $\frac{3}{8}$	$\frac{1}{4}$	10.85	34.00	14	16 $\frac{1}{2}$
$\frac{11}{16}$	3.80	8.25	8	9 $\frac{3}{8}$	$\frac{1}{4}$	11.60	36.50	14	16 $\frac{1}{2}$
$\frac{3}{4}$	4.10	9.00	8	9 $\frac{3}{8}$	$\frac{1}{2}$	12.40	39.00	16	18 $\frac{1}{2}$
$\frac{13}{16}$	4.50	10.00	9	11 $\frac{1}{4}$	$\frac{1}{8}$	14.00	42.00	16	18 $\frac{1}{2}$
$\frac{7}{8}$	4.80	11.00	9	11 $\frac{1}{4}$	$\frac{1}{8}$	15.00	46.00	16	18 $\frac{1}{2}$
$\frac{15}{16}$	5.10	12.00	9	11 $\frac{1}{4}$	2	16.00	50.00	16	18 $\frac{1}{2}$
1	5.40	13.00	9	11 $\frac{1}{4}$					

High Speed Reamers No. 638 not carried in stock regularly.

TAPER LOCOMOTIVE REAMERS WITH TAPER SHANKS



CARBON
STEEL NO. 157
HIGH-SPEED
STEEL NO. 640

FIG. 3226
(Eccentric Flutes)

Regular Taper $\frac{1}{8}$ inch per foot of length.

Diameter, Inches	Price Each		Length of Flute, Inches	Length Over All, Inches	Shank Taper
	Carbon Steel	High Speed			
$\frac{1}{4}$	\$3.10	\$6.00	4	7 $\frac{1}{8}$	No. 1
$\frac{3}{8}$	3.10	6.25	4	7 $\frac{1}{8}$	
$\frac{1}{2}$	3.15	6.50	4	7 $\frac{1}{8}$	
$\frac{5}{8}$	3.15	6.75	4	7 $\frac{1}{8}$	
$\frac{3}{4}$	3.20	7.00	5	8 $\frac{1}{8}$	
$\frac{7}{8}$	3.25	7.25	5	8 $\frac{1}{8}$	
1	3.30	7.50	6	9 $\frac{1}{8}$	
$1\frac{1}{8}$	3.45	7.75	6	9 $\frac{1}{8}$	
$1\frac{1}{4}$	3.50	8.00	7	10 $\frac{1}{8}$	
$1\frac{1}{2}$	3.50	8.75	8	11 $\frac{1}{8}$	
$1\frac{3}{4}$	4.00	9.50	8	11 $\frac{1}{8}$	No. 2
2	4.50	10.25	8	11 $\frac{1}{8}$	
$2\frac{1}{4}$	4.90	11.00	8	11 $\frac{1}{8}$	
$2\frac{1}{2}$	5.30	12.00	9	12 $\frac{1}{8}$	
$2\frac{3}{4}$	5.70	13.00	9	12 $\frac{1}{8}$	
3	6.05	14.00	9	13 $\frac{1}{8}$	No. 3
1	6.40	15.50	9	13 $\frac{1}{8}$	
$1\frac{1}{8}$	6.60	17.00	9	13 $\frac{1}{8}$	
$1\frac{1}{4}$	6.80	18.50	10	14 $\frac{1}{8}$	
$1\frac{1}{2}$	7.25	20.00	10	14 $\frac{1}{8}$	
$1\frac{3}{4}$	7.70	22.00	10	15 $\frac{1}{8}$	
2	8.35	24.00	12	17 $\frac{1}{8}$	
$2\frac{1}{8}$	8.80	26.00	12	17 $\frac{1}{8}$	No. 4
$2\frac{1}{4}$	9.35	28.00	12	17 $\frac{1}{8}$	
$2\frac{1}{2}$	9.90	30.00	12	17 $\frac{1}{8}$	
$2\frac{3}{4}$	10.55	32.50	14	19 $\frac{1}{8}$	
3	11.20	35.00	14	19 $\frac{1}{8}$	
$3\frac{1}{8}$	11.95	38.00	14	19 $\frac{1}{8}$	
$3\frac{1}{4}$	12.75	41.00	14	20 $\frac{1}{8}$	No. 5
$3\frac{1}{2}$	13.65	44.00	16	22 $\frac{1}{8}$	
$3\frac{3}{4}$	14.60	47.00	16	22 $\frac{1}{8}$	
4	15.70	51.00	16	22 $\frac{1}{8}$	
2	16.80	55.00	16	22 $\frac{1}{8}$	

High Speed Reamers No. 640 are not carried in stock regularly.

All sizes, dimensions and tapers not listed are special and subject to special prices.

NO. 30 SET-TAPER PIN REAMERS

This set was specially designed for the automobile kit. It consists of the following sizes of Taper Pin Reamers:

0, 1, 2, 3, 4, 5.

They are put up in a round wooden box, five inches high by two in diameter, handsomely finished in dark maroon.

Price complete\$9.50



FIG. 3227

No. 137—STANDARD TAPER PIN REAMERS



FIG. 3228

Taper $\frac{1}{4}$ -inch per foot.

Size, Number	Price, Each	Diameter at Small End, Inches	Length of Flute, Inches	Length Over All, Inches
0	\$1.00	.127	$1\frac{5}{8}$	$2\frac{3}{8}$
1	1.00	.146	$1\frac{3}{4}$	$2\frac{1}{2}$
2	1.25	.162	2	3
3	1.50	.183	$2\frac{1}{4}$	$3\frac{1}{2}$
4	1.75	.208	$2\frac{1}{2}$	4
5	2.00	.240	3	$4\frac{1}{2}$
6	2.25	.279	$3\frac{3}{8}$	5
7	2.50	.331	$4\frac{1}{2}$	6
8	3.00	.398	$5\frac{1}{4}$	$6\frac{3}{4}$
9	3.50	.482	$6\frac{1}{8}$	8
10	4.50	.581	7	9
11	6.00	.706	$8\frac{1}{4}$	$11\frac{1}{4}$
12	7.50	.842	10	$13\frac{3}{8}$
13	9.00	1.009	12	16
14	11.00	1.250	14	$18\frac{1}{4}$

These reamers are all of the same taper and the point of each reamer will enter the hole reamed by the next size smaller.

No. 137A—BIT STOCK TAPER REAMERS



FIG. 3229

Size, Inches	Price, Each	Length of Flute, Inches	Length Over All, Inches	Size, Inches	Price, Each	Length of Flute, Inches	Length Over All, Inches
$\frac{1}{4}$	\$0.60	$1\frac{7}{8}$	$4\frac{1}{4}$	$1\frac{1}{16}$	\$1.10	3	$5\frac{15}{16}$
$\frac{5}{16}$	.60	2	$4\frac{1}{2}$	$\frac{3}{4}$	1.25	$3\frac{1}{8}$	$6\frac{1}{4}$
$\frac{3}{8}$	.65	$2\frac{1}{8}$	$4\frac{3}{4}$	$1\frac{1}{16}$	1.50	$3\frac{3}{8}$	$6\frac{1}{4}$
$\frac{7}{16}$	.70	$2\frac{1}{4}$	$4\frac{15}{16}$	$\frac{7}{8}$	1.75	$3\frac{1}{2}$	$6\frac{11}{16}$
$\frac{1}{2}$	.75	$2\frac{9}{16}$	$5\frac{3}{16}$	$1\frac{1}{8}$	2.00	$3\frac{1}{2}$	$6\frac{11}{16}$
$\frac{9}{16}$	.80	$2\frac{11}{16}$	$5\frac{9}{16}$	1	2.25	4	$7\frac{1}{4}$
$\frac{5}{8}$	.95	$2\frac{3}{4}$	$5\frac{11}{16}$				

These reamers have a taper approximating $\frac{3}{4}$ -inch to the foot. They are about $\frac{1}{16}$ -inch larger at the large end than the size stamped on the shank and the point of each reamer will enter the hole reamed by the next size smaller.

Always give list number when ordering.

TAPER BRIDGE REAMERS

(WITH SQUARE SHANKS)

CARBON STEEL NO. 150

HIGH SPEED STEEL NO. 614



FIG. 3230

Diameter Inches			Price Each		Length of Flute Inches	Length Over All Inches
			Carbon Steel	High Speed		
A	B	C				
1/4	1/4	3/16	\$2.30	\$2.50	3 3/8	4 1/4
3/8	3/8	1/4	2.35	2.70	3 3/4	4 3/4
1/2	1/2	3/8	2.40	2.70	3 3/4	4 3/4
5/8	5/8	1/2	2.45	2.90	4	5 1/2
3/4	3/4	5/8	2.50	2.90	4	5 1/2
7/8	7/8	3/4	2.55	3.10	4 3/8	6 1/2
1	1	7/8	2.60	3.10	4 3/8	6 1/2
1 1/8	1 1/8	1	2.65	3.30	5 3/8	8 1/2
1 1/4	1 1/4	1 1/8	2.75	3.30	5 3/8	8 1/2
1 1/2	1 1/2	1 1/4	2.90	3.50	5 3/8	8 1/2
1 3/4	1 3/4	1 1/2	3.05	3.70	6 1/8	9 1/8
2	2	1 3/4	3.20	3.90	7 1/8	10 1/8
2 1/4	2 1/4	2	3.35	4.10	7 3/8	10 1/2
2 1/2	2 1/2	2 1/4	3.50	4.40	7 3/8	10 1/2
2 3/4	2 3/4	2 1/2	3.75	4.70	7 3/8	10 5/8
3	3	2 3/4	4.00	5.00	7 3/8	10 5/8
3 1/4	3 1/4	3	4.25	5.30	7 3/8	10 5/8
3 1/2	3 1/2	3 1/4	4.50	5.85	7 3/8	10 5/8
3 3/4	3 3/4	3 1/2	4.75	6.40	7 3/8	10 5/8
4	4	3 3/4	5.00	6.95	7 3/8	10 5/8
4 1/4	4 1/4	4	5.50	7.50	7 3/8	10 5/8
4 1/2	4 1/2	4 1/4	6.00	8.25	7 3/8	10 5/8
4 3/4	4 3/4	4 1/2	6.50	9.00	7 3/8	10 5/8
5	5	4 3/4	7.00	10.00	7 3/8	10 5/8
5 1/4	5 1/4	5	8.00	11.00	7 3/8	10 5/8

These Reamers are especially designed for severe service and particularly adapted for use in Structural Iron and Steel, Boiler Plate, etc., where precision is not absolutely required.

High Speed Reamers No. 614 are not carried in stock regularly.

All sizes and dimensions not listed are special and subject to special prices.

TAPER BRIDGE REAMERS

(WITH TAPER SHANKS)

CARBON STEEL NO. 150A

HIGH SPEED STEEL NO. 615



FIG. 3231

Diameter Inches			Price Each		Length of Flute Inches	Length Over All Inches	Shank Taper
			Carbon Steel	High Speed			
A	B	C					
1/4	1/4	3/8	\$2.30	\$3.00	3 3/8	6 3/8	No. 1
5/16	5/16	1/2	2.35	3.25	3 3/4	6 3/4	
3/8	3/8	5/8	2.40	3.25	3 3/4	6 3/4	
7/16	7/16	3/4	2.45	3.50	4	7 1/4	
1/2	1/2	7/8	2.50	3.50	4	7 1/4	
5/8	5/8	1	2.55	3.75	4 3/8	8 1/4	No. 2
3/4	3/4	1 1/8	2.60	3.75	4 3/8	8 1/4	
7/8	7/8	1 1/4	2.65	4.00	5 1/8	9	
1	1	1 1/2	2.75	4.00	5 1/8	9	
1 1/8	1 1/8	1 3/4	2.90	4.25	5 1/8	9	
1 1/4	1 1/4	2	3.05	4.50	6 1/8	10	No. 3
1 1/2	1 1/2	2 1/8	3.20	4.75	7 1/8	11 3/8	
1 3/4	1 3/4	2 1/4	3.35	5.00	7 3/8	12	
2	2	2 3/4	3.50	5.30	7 3/8	12	
2 1/8	2 1/8	3	3.75	5.70	7 3/8	12	
2 1/4	2 1/4	3 1/8	4.00	6.00	7 3/8	12	No. 4
2 3/8	2 3/8	3 1/4	4.25	6.50	7 3/8	12	
2 1/2	2 1/2	3 3/8	4.50	7.00	7 3/8	12	
2 3/4	2 3/4	3 1/2	4.75	7.50	7 3/8	12	
3	3	3 3/4	5.00	8.00	7 3/8	12	
3 1/8	3 1/8	4	5.50	8.75	7 3/8	13	No. 4
3 1/4	3 1/4	4 1/8	6.00	9.50	7 3/8	13	
3 1/2	3 1/2	4 1/4	6.50	10.50	7 3/8	13	
3 3/4	3 3/4	4 1/2	7.00	12.00	7 3/8	13	
4	4	4 3/4	8.00	14.00	7 3/8	13	

These Reamers are especially designed for severe service and particularly adapted for use in Structural Iron and Steel, Boiler Plate, etc., where precision is not absolutely required.

All sizes and dimensions not listed are special and subject to special prices.

ARBORS FOR SHELL TOOLS

No. 78-STRAIGHT SHANK



FIG. 3232

No. 79-TAPER SHANK



FIG. 3233

This arbor is provided with a sliding collar which can be forced forward by a turn or two of the adjusting nut which bears on it, thus quickly releasing the shell tool, no matter how hard it may have become jammed on the arbor, without removing the arbor from the machine.

The device not only saves time, but insures against the damage which so often comes from trying to force a tight fitting tool off the ordinary arbor.

Size. Number	Price No. 79 Taper Shank	Price No. 78 Straight Shank	Fitting Sizes, Inches	Length Over All, Inches	Taper Shank
3	\$4.35	\$3.60	$\frac{1}{2}$ to $\frac{5}{8}$	8	No. 1
4	4.90	4.05	$\frac{41}{64}$ to $\frac{3}{4}$	9	No. 2
5	5.40	4.50	$\frac{49}{64}$ to 1	$9\frac{1}{2}$	
6	5.95	4.95	$1\frac{1}{64}$ to $1\frac{1}{4}$	10	No. 3
7	6.45	5.40	$1\frac{7}{64}$ to $1\frac{3}{8}$	11	
8	7.20	6.00	$1\frac{11}{64}$ to 2	12	No. 4
9	8.10	6.75	$2\frac{1}{64}$ to $2\frac{1}{2}$	13	
10	9.45	7.90	$2\frac{23}{64}$ to 3	14	No. 5
11	13.50	11.25	$3\frac{1}{64}$ to $3\frac{1}{2}$	15	
12	18.90	15.75	$3\frac{33}{64}$ to 4	16	
13	24.30	20.25	$4\frac{1}{64}$ to $4\frac{1}{2}$	17	
14	32.40	27.00	$4\frac{33}{64}$ to $5\frac{1}{2}$	18	
15	39.60	33.00	$5\frac{33}{64}$ to 6	19	No. 6

Always give list number when ordering.

No. 133—ARBORS FOR SHELL REAMERS AND SHELL DRILLS



FIG. 3234

Size, No.	Price, Each	Fitting Sizes, Inches	Length Over All, Inches	Size, No.	Price, Each	Fitting Sizes, Inches	Length Over All, Inches
3	\$2.40	$\frac{1}{2}$ to $\frac{5}{8}$	8	10	\$5.25	$2\frac{33}{64}$ to 3	14
4	2.70	$\frac{41}{64}$ to $\frac{3}{4}$	9	11	7.50	$3\frac{1}{64}$ to $3\frac{1}{2}$	15
5	3.00	$\frac{49}{64}$ to 1	$9\frac{1}{2}$	12	10.50	$3\frac{33}{64}$ to 4	16
6	3.30	$1\frac{1}{64}$ to $1\frac{1}{4}$	10	13	13.50	$4\frac{1}{64}$ to $4\frac{1}{2}$	17
7	3.60	$1\frac{17}{64}$ to $1\frac{3}{8}$	11	14	18.00	$4\frac{33}{64}$ to $5\frac{1}{2}$	18
8	4.00	$1\frac{41}{64}$ to 2	12	15	22.00	$5\frac{33}{64}$ to 6	19
9	4.50	$2\frac{1}{64}$ to $2\frac{1}{2}$	13				

No. 133A—TAPER SHANK ARBORS FOR SHELL REAMERS AND SHELL DRILLS



FIG. 3235

Size, No.	Price, Each	Fitting Sizes, Inches	Length Over All, Inches	Shank Taper
3	\$2.90	$\frac{1}{2}$ to $\frac{5}{8}$	8	No. 1
4	3.25	$\frac{41}{64}$ to $\frac{3}{4}$	9	No. 2
5	3.60	$\frac{49}{64}$ to 1	$9\frac{1}{2}$	
6	3.95	$1\frac{1}{64}$ to $1\frac{1}{4}$	10	
7	4.30	$1\frac{17}{64}$ to $1\frac{3}{8}$	11	No. 3
8	4.80	$1\frac{41}{64}$ to 2	12	No. 4
9	5.40	$2\frac{1}{64}$ to $2\frac{1}{2}$	13	
10	6.30	$2\frac{33}{64}$ to 3	14	
11	9.00	$3\frac{1}{64}$ to $3\frac{1}{2}$	15	No. 5
12	12.60	$3\frac{33}{64}$ to 4	16	
13	16.20	$4\frac{1}{64}$ to $4\frac{1}{2}$	17	
14	21.60	$4\frac{33}{64}$ to $5\frac{1}{2}$	18	No. 6
15	26.40	$5\frac{33}{64}$ to 6	19	

Always give list number when ordering.

ROSE SHELL REAMERS



No. 130B CARBON STEEL

FIG. 3236

No 622

HIGH SPEED STEEL

Diameter, Inches	Price, Each		Length Over All, Inches	Size Hole, Large End	Fitting Arbor	Diameter, Inches	Price, Each		Length Over All, Inches	Size Hole, Large End	Fitting Arbor
	Carbon Steel	High Speed					Carbon Steel	High Speed			
$\frac{1}{2}$	\$1.70	\$3.25	12 1/2	$\frac{1}{4}$	No. 3	$\frac{1}{2}$	\$11.00	\$24.25	4	$\frac{1}{2}$	No. 10
$\frac{3}{8}$	1.80	3.40	12 1/2	$\frac{3}{8}$		$\frac{3}{8}$	11.40	25.50	4	$\frac{3}{8}$	
$\frac{5}{8}$	1.90	3.55	12 1/2	$\frac{5}{8}$		$\frac{5}{8}$	11.80	27.00	4	$\frac{5}{8}$	
$\frac{7}{8}$	2.00	3.70	21 1/4	$\frac{7}{8}$	No. 4	1	12.20	28.50	4	$\frac{7}{8}$	No. 11
1	2.10	3.85	21 1/4	1		1 1/8	12.60	30.00	4	1 1/8	
$1 \frac{1}{8}$	2.20	4.00	21 1/2	$1 \frac{1}{8}$	No. 5	$1 \frac{1}{4}$	13.10	31.50	4 1/2	$1 \frac{1}{4}$	No. 12
$1 \frac{1}{4}$	2.30	4.25	21 1/2	$1 \frac{1}{4}$		$1 \frac{3}{8}$	13.60	33.25	4 1/2	$1 \frac{3}{8}$	
$1 \frac{3}{8}$	2.40	4.50	21 1/2	$1 \frac{3}{8}$		$1 \frac{1}{2}$	14.10	35.25	4 1/2	$1 \frac{1}{2}$	
$1 \frac{1}{2}$	2.50	4.75	21 1/2	$1 \frac{1}{2}$	No. 6	$1 \frac{3}{4}$	14.60	37.50	4 1/2	$1 \frac{3}{4}$	No. 13
$1 \frac{3}{4}$	2.70	5.00	21 3/4	$1 \frac{3}{4}$		2	15.10	40.00	4 1/2	2	
$1 \frac{7}{8}$	2.90	5.25	21 3/4	$1 \frac{7}{8}$		$2 \frac{1}{8}$	15.60	42.50	4 1/2	$2 \frac{1}{8}$	
$1 \frac{7}{8}$	3.10	5.50	21 3/4	$1 \frac{7}{8}$	No. 7	$2 \frac{1}{4}$	16.10	45.25	4 1/2	$2 \frac{1}{4}$	No. 14
$1 \frac{7}{8}$	3.30	5.75	21 3/4	$1 \frac{7}{8}$		$2 \frac{3}{8}$	16.60	48.00	4 1/2	$2 \frac{3}{8}$	
$1 \frac{7}{8}$	3.55	6.00	3	$1 \frac{7}{8}$		$2 \frac{1}{2}$	17.20	50.75	5	$2 \frac{1}{2}$	
$1 \frac{7}{8}$	3.80	6.50	3	$1 \frac{7}{8}$	No. 8	$2 \frac{3}{4}$	17.80	53.50	5	$2 \frac{3}{4}$	No. 15
$1 \frac{7}{8}$	4.05	7.00	3	$1 \frac{7}{8}$		$2 \frac{7}{8}$	18.40	56.50	5	$2 \frac{7}{8}$	
$1 \frac{7}{8}$	4.30	7.50	3	$1 \frac{7}{8}$		$2 \frac{7}{8}$	19.00	59.50	5	$2 \frac{7}{8}$	
$1 \frac{7}{8}$	4.55	8.25	3	$1 \frac{7}{8}$	No. 9	$2 \frac{7}{8}$	19.60	62.75	5	$2 \frac{7}{8}$	No. 16
$1 \frac{7}{8}$	4.80	9.00	3	$1 \frac{7}{8}$		$2 \frac{7}{8}$	20.20	66.00	5	$2 \frac{7}{8}$	
$1 \frac{7}{8}$	5.10	9.75	3 1/2	$1 \frac{7}{8}$		$2 \frac{7}{8}$	20.80	69.25	5	$2 \frac{7}{8}$	
$1 \frac{7}{8}$	5.40	10.50	3 1/2	$1 \frac{7}{8}$	No. 10	$2 \frac{7}{8}$	21.40	72.50	5	$2 \frac{7}{8}$	
$1 \frac{7}{8}$	5.70	11.25	3 1/2	$1 \frac{7}{8}$		$2 \frac{7}{8}$	22.90	79.00	5 1/2	$2 \frac{7}{8}$	
$1 \frac{7}{8}$	6.00	12.00	3 1/2	$1 \frac{7}{8}$		$2 \frac{7}{8}$	24.40	85.50	5 1/2	$2 \frac{7}{8}$	
$1 \frac{7}{8}$	6.30	12.75	3 1/2	$1 \frac{7}{8}$	No. 11	$2 \frac{7}{8}$	25.90	92.00	5 1/2	$2 \frac{7}{8}$	No. 17
$1 \frac{7}{8}$	6.60	13.50	3 1/2	$1 \frac{7}{8}$		$2 \frac{7}{8}$	27.40	98.50	5 1/2	$2 \frac{7}{8}$	
$1 \frac{7}{8}$	6.95	14.25	3 3/4	$1 \frac{7}{8}$		$2 \frac{7}{8}$	29.30	105.00	6	$2 \frac{7}{8}$	
$1 \frac{7}{8}$	7.30	15.00	3 3/4	$1 \frac{7}{8}$	No. 12	$2 \frac{7}{8}$	31.20	111.50	6	$2 \frac{7}{8}$	No. 18
$1 \frac{7}{8}$	7.65	15.75	3 3/4	$1 \frac{7}{8}$		$2 \frac{7}{8}$	33.10	118.00	6	$2 \frac{7}{8}$	
$1 \frac{7}{8}$	8.00	16.50	3 3/4	$1 \frac{7}{8}$		$2 \frac{7}{8}$	35.00	125.00	6	$2 \frac{7}{8}$	
$1 \frac{7}{8}$	8.35	17.25	3 3/4	$1 \frac{7}{8}$	No. 13	$2 \frac{7}{8}$	37.40	132.50	6	$2 \frac{7}{8}$	No. 19
$1 \frac{7}{8}$	8.70	18.00	3 3/4	$1 \frac{7}{8}$		$2 \frac{7}{8}$	39.80	140.00	6	$2 \frac{7}{8}$	
$1 \frac{7}{8}$	9.05	18.75	3 3/4	$1 \frac{7}{8}$		$2 \frac{7}{8}$	42.20	147.50	6	$2 \frac{7}{8}$	
$1 \frac{7}{8}$	9.40	19.50	3 3/4	$1 \frac{7}{8}$	No. 14	$2 \frac{7}{8}$	44.60	155.00	6	$2 \frac{7}{8}$	No. 20
$1 \frac{7}{8}$	9.80	20.50	4	$1 \frac{7}{8}$		$2 \frac{7}{8}$	47.00	163.75	6 1/2	$2 \frac{7}{8}$	
$1 \frac{7}{8}$	10.20	21.75	4	$1 \frac{7}{8}$		$2 \frac{7}{8}$	50.60	172.50	6 1/2	$2 \frac{7}{8}$	
$1 \frac{7}{8}$	10.60	23.00	4	$1 \frac{7}{8}$	No. 15	$2 \frac{7}{8}$	53.60	181.25	6 1/2	$2 \frac{7}{8}$	No. 21
$1 \frac{7}{8}$	10.60	23.00	4	$1 \frac{7}{8}$		$2 \frac{7}{8}$	56.60	190.00	6 1/2	$2 \frac{7}{8}$	

Thirty-second sizes not listed from $\frac{1}{2}$ inch to 2 inch take list and arbor of next larger size.

All sizes and dimensions not listed are special and subject to special prices.
Always Give List Number When Ordering.

FLUTED SHELL REAMERS



No. 130A CARBON STEEL

FIG. 3237

No. 620 HIGH SPEED STEEL

Diameter, Inches	Price, Each		Length Over All, Inches	Size Hole, Large End	Fitting Arbor	Diameter, Inches	Price, Each		Length Over All, Inches	Size Hole, Large End	Fitting Arbor
	Carbon Steel	High Speed					Carbon Steel	High Speed			
$\frac{1}{2}$	\$1.70	\$3.25	12	$\frac{1}{4}$	No. 3	$\frac{1}{2}$	\$11.00	\$24.25	4	$\frac{1}{2}$	No. 10
$\frac{3}{8}$	1.80	3.40	12	$\frac{1}{4}$		$\frac{1}{2}$	11.40	25.50	4	$\frac{1}{2}$	
$\frac{1}{4}$	1.90	3.55	12	$\frac{1}{4}$		$\frac{1}{2}$	11.80	27.00	4	$\frac{1}{2}$	
$\frac{11}{32}$	2.00	3.70	$2\frac{1}{4}$	$\frac{3}{8}$	No. 4	$\frac{1}{2}$	12.20	28.50	4	$\frac{1}{2}$	No. 10
$\frac{3}{16}$	2.10	3.85	$2\frac{1}{4}$	$\frac{3}{8}$		$\frac{1}{2}$	12.60	30.00	4	$\frac{1}{2}$	
$\frac{13}{32}$	2.20	4.00	$2\frac{1}{4}$	$\frac{1}{2}$		$\frac{3}{16}$	13.10	31.50	$4\frac{1}{2}$	$\frac{1}{2}$	No. 11
$\frac{7}{16}$	2.30	4.25	$2\frac{1}{2}$	$\frac{1}{2}$	No. 5	$\frac{3}{16}$	13.60	33.25	$4\frac{1}{2}$	$\frac{1}{2}$	
$\frac{15}{32}$	2.40	4.50	$2\frac{1}{2}$	$\frac{1}{2}$		$\frac{3}{16}$	14.10	35.25	$4\frac{1}{2}$	$\frac{1}{2}$	
1	2.50	4.75	$2\frac{1}{2}$	$\frac{1}{2}$		$\frac{3}{16}$	14.60	37.50	$4\frac{1}{2}$	$\frac{1}{2}$	
$1\frac{1}{16}$	2.70	5.00	$2\frac{3}{4}$	$\frac{5}{8}$	No. 6	$\frac{3}{16}$	15.10	40.00	$4\frac{1}{2}$	$\frac{1}{2}$	
$1\frac{1}{8}$	2.90	5.25	$2\frac{3}{4}$	$\frac{5}{8}$		$\frac{3}{16}$	15.60	42.50	$4\frac{1}{2}$	$\frac{1}{2}$	No. 12
$1\frac{1}{4}$	3.10	5.50	$2\frac{3}{4}$	$\frac{5}{8}$		$\frac{3}{16}$	16.10	45.25	$4\frac{1}{2}$	$\frac{1}{2}$	
$1\frac{3}{8}$	3.30	5.75	$2\frac{3}{4}$	$\frac{5}{8}$	No. 7	$\frac{3}{16}$	16.60	48.00	$4\frac{1}{2}$	$\frac{1}{2}$	
$1\frac{5}{8}$	3.55	6.00	3	$\frac{3}{4}$		$\frac{3}{16}$	17.20	50.75	5	2	
$1\frac{7}{8}$	3.80	6.50	3	$\frac{3}{4}$		$\frac{3}{16}$	17.80	53.50	5	2	No. 13
$1\frac{9}{8}$	4.05	7.00	3	$\frac{3}{4}$	No. 8	$\frac{3}{16}$	18.40	56.50	5	2	
$1\frac{11}{8}$	4.30	7.50	3	$\frac{3}{4}$		$\frac{3}{16}$	19.00	59.50	5	2	
$1\frac{13}{8}$	4.55	8.25	3	$\frac{3}{4}$		$\frac{3}{16}$	19.60	62.75	5	2	
$1\frac{15}{8}$	4.80	9.00	3	$\frac{3}{4}$		$\frac{3}{16}$	20.20	66.00	5	2	
$1\frac{17}{8}$	5.10	9.75	$3\frac{1}{2}$	1	No. 9	$\frac{3}{16}$	20.80	69.25	5	2	No. 14
$1\frac{19}{8}$	5.40	10.50	$3\frac{1}{2}$	1		4	21.40	72.50	5	2	
$1\frac{21}{8}$	5.70	11.25	$3\frac{1}{2}$	1		$4\frac{1}{8}$	22.90	79.00	$5\frac{1}{2}$	$2\frac{1}{4}$	
$1\frac{23}{8}$	6.00	12.00	$3\frac{1}{2}$	1	No. 10	$4\frac{1}{8}$	24.40	85.50	$5\frac{1}{2}$	$2\frac{1}{4}$	No. 15
$1\frac{25}{8}$	6.30	12.75	$3\frac{1}{2}$	1		$4\frac{1}{8}$	25.90	92.00	$5\frac{1}{2}$	$2\frac{1}{4}$	
2	6.60	13.50	$3\frac{1}{2}$	1		$4\frac{1}{8}$	27.40	98.50	$5\frac{1}{2}$	$2\frac{1}{4}$	
$2\frac{1}{8}$	6.95	14.25	$3\frac{3}{4}$	$1\frac{1}{4}$	No. 11	4	29.90	105.00	6	$2\frac{1}{2}$	
$2\frac{1}{4}$	7.30	15.00	$3\frac{3}{4}$	$1\frac{1}{4}$		4	31.20	111.50	6	$2\frac{1}{2}$	
$2\frac{1}{2}$	7.65	15.75	$3\frac{3}{4}$	$1\frac{1}{4}$		4	33.10	118.00	6	$2\frac{1}{2}$	No. 16
$2\frac{3}{4}$	8.00	16.50	$3\frac{3}{4}$	$1\frac{1}{4}$	No. 12	5	35.00	125.00	6	$2\frac{1}{2}$	
$2\frac{5}{8}$	8.35	17.25	$3\frac{3}{4}$	$1\frac{1}{4}$		5	37.40	132.50	6	$2\frac{1}{2}$	
$2\frac{7}{8}$	8.70	18.00	$3\frac{3}{4}$	$1\frac{1}{4}$		5	39.80	140.00	6	$2\frac{1}{2}$	
$2\frac{9}{8}$	9.05	18.75	$3\frac{3}{4}$	$1\frac{1}{4}$	No. 13	5	42.20	147.50	6	$2\frac{1}{2}$	
$2\frac{11}{8}$	9.40	19.50	$3\frac{3}{4}$	$1\frac{1}{4}$		5	44.60	155.00	6	$2\frac{1}{2}$	
$2\frac{13}{8}$	9.80	20.50	4	$1\frac{1}{2}$		5	47.00	163.75	$6\frac{1}{2}$	$2\frac{3}{4}$	No. 17
$2\frac{15}{8}$	10.20	21.75	4	$1\frac{1}{2}$	No. 14	5	50.00	172.50	$6\frac{1}{2}$	$2\frac{3}{4}$	
$2\frac{17}{8}$	10.60	23.00	4	$1\frac{1}{2}$		5	53.60	181.25	$6\frac{1}{2}$	$2\frac{3}{4}$	
$2\frac{19}{8}$	11.00	24.25	4	$1\frac{1}{2}$		6	56.60	190.00	$6\frac{1}{2}$	$2\frac{3}{4}$	No. 18
$2\frac{21}{8}$	11.40	25.50	4	$1\frac{1}{2}$		6	60.00	200.00	7	$2\frac{3}{4}$	
$2\frac{23}{8}$	11.80	26.75	4	$1\frac{1}{2}$		6	63.40	210.00	7	$2\frac{3}{4}$	

Thirty-second sizes not listed from $\frac{1}{2}$ inch to 2 inch take list and arbor of next larger size.

All sizes and dimensions not listed are special and subject to special prices.

Always Give List Number When Ordering.

THE SUPER ADJUSTABLE REAMER HIGH SPEED CHUCKING TYPE

No. 20



FIG. 3238

No. 21



FIG. 3239

Shank and body of reamer are made from one solid piece of steel, giving great strength.

Blades are unevenly spaced to prevent chattering.

Intermediate sizes and millimeter sizes will be furnished at price of next larger listed size. Sizes larger than 3 inches made special to order.

If preferred these reamers will be made special to order with carbon steel blades.

Order by Figure Number.

Size of Reamer	Length Over All, Inches	Price No. 20 Reamer	Price No. 21 Reamer	Size of Reamer	Length Over All, Inches	Price No. 20 Reamer	Price No. 21 Reamer
$\frac{1}{16}$	10	\$11.50	\$12.20	2	14 $\frac{1}{2}$	\$21.00	\$23.20
1	10	12.00	12.80	2 $\frac{1}{16}$	15	21.60	24.00
1 $\frac{1}{16}$	10	12.50	13.40	2 $\frac{1}{8}$	15	22.20	24.80
1 $\frac{1}{8}$	10	13.00	14.00	2 $\frac{3}{16}$	15	22.80	25.60
1 $\frac{1}{4}$	11	13.50	14.60	2 $\frac{1}{2}$	15	23.40	26.40
1 $\frac{3}{8}$	11	14.00	15.20	2 $\frac{5}{8}$	15	24.00	27.20
1 $\frac{1}{2}$	12	14.50	15.80	2 $\frac{3}{4}$	15	24.60	28.00
1 $\frac{5}{8}$	12	15.00	16.40	2 $\frac{7}{8}$	15 $\frac{1}{2}$	25.30	28.80
1 $\frac{3}{4}$	12	15.60	17.00	2 $\frac{9}{8}$	15 $\frac{1}{2}$	26.00	29.60
1 $\frac{7}{8}$	12	16.20	17.60	2 $\frac{11}{8}$	15 $\frac{1}{2}$	27.00	31.50
1 $\frac{9}{8}$	13	16.80	18.20	2 $\frac{13}{8}$	15 $\frac{1}{2}$	28.50	32.75
1 $\frac{11}{8}$	13	17.40	18.80	2 $\frac{15}{8}$	15 $\frac{1}{2}$	30.00	34.00
1 $\frac{13}{8}$	14	18.00	19.40	2 $\frac{17}{8}$	15 $\frac{1}{2}$	31.50	35.50
1 $\frac{15}{8}$	14	18.60	20.00	2 $\frac{19}{8}$	16	33.00	37.00
1 $\frac{17}{8}$	14	19.20	20.80	2 $\frac{21}{8}$	16	34.50	38.50
1 $\frac{19}{8}$	14	19.80	21.60	2 $\frac{23}{8}$	16	36.50	40.00
1 $\frac{21}{8}$	14 $\frac{1}{2}$	20.40	22.40	3	16	38.00	41.50

No. 21 Super Reamers are furnished with No. 1 Morse Taper shanks in sizes from $\frac{1}{16}$ to 1 $\frac{1}{16}$, No. 2 from 1 $\frac{1}{8}$ to 1 $\frac{3}{8}$, No. 3 from 1 $\frac{1}{2}$ to 1 $\frac{7}{8}$, No. 4 from 1 $\frac{9}{8}$ to 2 $\frac{1}{8}$, and No. 5 from 2 $\frac{3}{8}$ up.

Other sizes Morse Taper shanks will be furnished special to order at an additional charge.

For extra Blades, see page 1040.

THE SUPER ADJUSTABLE HAND REAMER

No. 18



FIG. 3240

No. 18 represents the Super Adjustable Hand Reamer. Blades are extra long and are unevenly spaced to prevent chattering.

Intermediate sizes and millimeter sizes will be furnished at the same price as next larger listed size. Sizes larger than 3 inch made special to order.

The guide sleeve is hardened and ground and may be used in different positions on the shank or may be removed entirely in reaming short holes. In either case the Reamer is lighter and easier to handle than other Hand Reamers.

Size of Reamer Inches	Length Over All Inches	Carbon Blades	High Speed Blades
$\frac{1}{16}$	$7\frac{1}{4}$	\$ 8.80	\$13.50
1	$7\frac{1}{4}$	9.20	14.10
$1\frac{1}{16}$	$7\frac{3}{4}$	9.60	14.70
$1\frac{1}{8}$	8	10.00	15.30
$1\frac{1}{4}$	$8\frac{1}{8}$	10.50	16.00
$1\frac{1}{2}$	$8\frac{3}{8}$	11.00	16.70
$1\frac{3}{8}$	9	11.50	17.40
$1\frac{7}{8}$	9	12.00	18.20
$1\frac{1}{2}$	$9\frac{1}{2}$	12.75	19.10
$1\frac{1}{2}$	$9\frac{1}{2}$	13.50	20.00
$1\frac{1}{2}$	$9\frac{7}{8}$	14.25	21.00
$1\frac{5}{8}$	$9\frac{7}{8}$	15.00	22.00
$1\frac{1}{2}$	$10\frac{1}{4}$	15.75	23.10
$1\frac{3}{4}$	$10\frac{1}{4}$	16.50	24.20
$1\frac{1}{2}$	$10\frac{3}{4}$	17.25	25.30
$1\frac{3}{4}$	$10\frac{3}{4}$	18.00	26.40
$1\frac{1}{2}$	$11\frac{1}{4}$	18.75	27.50
2	$11\frac{1}{4}$	19.50	28.60
$2\frac{1}{16}$	$11\frac{5}{8}$	20.25	29.70
$2\frac{1}{8}$	$11\frac{5}{8}$	21.00	30.80
$2\frac{1}{4}$	$12\frac{1}{8}$	21.75	32.00
$2\frac{1}{4}$	$12\frac{1}{8}$	22.50	33.20
$2\frac{1}{2}$	$12\frac{5}{8}$	23.25	34.40
$2\frac{3}{8}$	$12\frac{5}{8}$	24.00	35.60
$2\frac{1}{2}$	13	24.75	36.80
$2\frac{1}{2}$	13	25.50	38.00
$2\frac{1}{2}$	$13\frac{3}{8}$	26.50	39.25
$2\frac{5}{8}$	$13\frac{3}{8}$	27.50	40.50
$2\frac{1}{2}$	$13\frac{7}{8}$	28.50	41.75
$2\frac{3}{4}$	$13\frac{7}{8}$	29.50	43.00
$2\frac{1}{2}$	$14\frac{3}{8}$	30.50	44.25
$2\frac{3}{4}$	$14\frac{3}{8}$	31.50	45.50
$2\frac{1}{2}$	$14\frac{7}{8}$	32.50	47.00
3	$14\frac{7}{8}$	33.50	48.50

For extra Blades, see page 1046.

THE SUPER ADJUSTABLE SHELL REAMER

No. 24



FIG. 3241

Blades are unevenly spaced. No. 24 Reamers are furnished regularly with taper holes, taper $\frac{1}{8}$ inch to 1 foot.

Sizes over 6 inches will be made special to order. Intermediate sizes and millimeter sizes will be furnished at price of next larger listed size.

Size of Reamer	Price Each	Length Over All,	Size Hole,	Size of Reamer	Price Each	Length Over All,	Size Hole,
$1\frac{1}{16}$	\$12.00	2 $\frac{5}{8}$	$\frac{3}{8}$	$3\frac{5}{8}$	\$41.00	4 $\frac{1}{2}$	$1\frac{1}{2}$
$1\frac{1}{8}$	12.50	2 $\frac{7}{8}$	$\frac{7}{8}$	$3\frac{1}{2}$	42.05	$3\frac{1}{2}$	$1\frac{5}{8}$
$1\frac{1}{4}$	13.00	3	$\frac{1}{2}$	$3\frac{3}{4}$	43.10	$3\frac{1}{8}$	$1\frac{3}{4}$
$1\frac{3}{8}$	13.50	3	$\frac{1}{2}$	$3\frac{1}{4}$	44.15	$3\frac{1}{2}$	$1\frac{7}{8}$
$1\frac{1}{2}$	14.00	3	$\frac{1}{2}$	$3\frac{3}{8}$	45.20	$3\frac{1}{8}$	$1\frac{7}{8}$
$1\frac{5}{8}$	14.50	3	$\frac{1}{2}$	$3\frac{1}{2}$	46.25	$3\frac{1}{8}$	$1\frac{7}{8}$
$1\frac{7}{8}$	15.00	$3\frac{1}{4}$	$\frac{5}{8}$	4	47.30	$3\frac{1}{8}$	$1\frac{7}{8}$
$1\frac{9}{8}$	15.50	$3\frac{1}{4}$	$\frac{5}{8}$	$4\frac{1}{8}$	48.35	$3\frac{1}{8}$	2
$1\frac{11}{8}$	16.00	$3\frac{1}{4}$	$\frac{5}{8}$	$4\frac{1}{4}$	49.40	$3\frac{1}{8}$	2
$1\frac{3}{4}$	16.50	$3\frac{1}{4}$	$\frac{5}{8}$	$4\frac{3}{8}$	50.45	$3\frac{1}{8}$	2
$1\frac{7}{4}$	17.00	$3\frac{3}{8}$	$\frac{5}{8}$	$4\frac{1}{2}$	51.50	$3\frac{1}{8}$	2
$1\frac{9}{4}$	17.50	$3\frac{3}{8}$	$\frac{5}{8}$	$4\frac{3}{4}$	52.55	$3\frac{1}{8}$	2
$1\frac{11}{4}$	18.00	$3\frac{1}{2}$	$\frac{3}{4}$	$4\frac{7}{8}$	53.60	$3\frac{1}{8}$	2
2	18.50	$3\frac{1}{2}$	$\frac{3}{4}$	$4\frac{1}{2}$	54.65	$3\frac{1}{8}$	2
$2\frac{1}{16}$	19.00	$3\frac{3}{8}$	$\frac{3}{4}$	$4\frac{1}{2}$	55.70	$3\frac{1}{8}$	2
$2\frac{1}{8}$	19.50	$3\frac{3}{8}$	$\frac{3}{4}$	$4\frac{3}{4}$	56.75	$4\frac{1}{8}$	2
$2\frac{1}{4}$	20.00	$3\frac{1}{2}$	$\frac{3}{4}$	$4\frac{5}{8}$	57.80	$4\frac{1}{8}$	2
$2\frac{3}{8}$	20.50	$3\frac{1}{2}$	$\frac{3}{4}$	$4\frac{1}{2}$	58.85	$4\frac{1}{8}$	$2\frac{1}{4}$
$2\frac{1}{2}$	21.00	$3\frac{3}{8}$	$\frac{7}{8}$	$4\frac{3}{4}$	59.90	$4\frac{1}{8}$	$2\frac{1}{4}$
$2\frac{3}{4}$	21.75	$3\frac{3}{8}$	$\frac{7}{8}$	$4\frac{1}{2}$	60.95	$4\frac{1}{8}$	$2\frac{1}{4}$
$2\frac{5}{8}$	22.50	$4\frac{1}{8}$	1	$4\frac{7}{8}$	62.00	$4\frac{1}{8}$	$2\frac{1}{4}$
$2\frac{7}{8}$	23.25	$4\frac{1}{8}$	1	$4\frac{1}{2}$	63.05	$4\frac{1}{8}$	$2\frac{1}{4}$
$2\frac{9}{8}$	24.00	$4\frac{1}{4}$	1	5	64.10	$4\frac{1}{8}$	$2\frac{1}{4}$
$2\frac{11}{8}$	24.75	$4\frac{1}{4}$	1	$5\frac{1}{8}$	65.15	$4\frac{1}{8}$	$2\frac{1}{4}$
$2\frac{3}{4}$	25.50	$4\frac{1}{4}$	$1\frac{1}{8}$	$5\frac{1}{4}$	66.20	$4\frac{1}{8}$	$2\frac{1}{4}$
$2\frac{5}{4}$	26.50	$4\frac{1}{4}$	$1\frac{1}{8}$	$5\frac{3}{8}$	67.25	$4\frac{1}{8}$	$2\frac{1}{4}$
$2\frac{7}{4}$	27.50	$4\frac{1}{8}$	$1\frac{1}{4}$	$5\frac{1}{2}$	68.30	$4\frac{1}{8}$	$2\frac{1}{4}$
$2\frac{9}{4}$	28.50	$4\frac{1}{8}$	$1\frac{1}{4}$	$5\frac{5}{8}$	69.35	$4\frac{1}{8}$	$2\frac{1}{4}$
$2\frac{11}{4}$	29.50	$4\frac{3}{8}$	$1\frac{3}{8}$	$5\frac{3}{4}$	70.40	$4\frac{1}{8}$	$2\frac{1}{2}$
3	30.50	$4\frac{3}{8}$	$1\frac{3}{8}$	$5\frac{7}{8}$	71.45	$4\frac{1}{8}$	$2\frac{1}{2}$
$3\frac{1}{16}$	31.55	$4\frac{3}{8}$	$1\frac{3}{8}$	$5\frac{1}{2}$	72.50	$4\frac{1}{8}$	$2\frac{1}{2}$
$3\frac{1}{8}$	32.60	$4\frac{3}{8}$	$1\frac{3}{8}$	$5\frac{5}{8}$	73.55	$4\frac{1}{8}$	$2\frac{1}{2}$
$3\frac{1}{4}$	33.65	$4\frac{3}{8}$	$1\frac{3}{8}$	$5\frac{3}{4}$	74.60	$4\frac{1}{8}$	$2\frac{1}{2}$
$3\frac{3}{8}$	34.70	$4\frac{3}{8}$	$1\frac{3}{8}$	$5\frac{1}{2}$	75.65	$4\frac{1}{8}$	$2\frac{1}{2}$
$3\frac{1}{2}$	35.75	$4\frac{7}{8}$	$1\frac{1}{2}$	$5\frac{3}{4}$	76.70	$4\frac{1}{8}$	$2\frac{1}{2}$
$3\frac{3}{4}$	36.80	$4\frac{7}{8}$	$1\frac{1}{2}$	$5\frac{1}{2}$	77.75	$4\frac{1}{8}$	$2\frac{3}{4}$
$3\frac{5}{8}$	37.85	$4\frac{7}{8}$	$1\frac{1}{2}$	$5\frac{5}{8}$	78.80	$4\frac{1}{8}$	$2\frac{3}{4}$
$3\frac{7}{8}$	38.90	$4\frac{7}{8}$	$1\frac{1}{2}$	$5\frac{1}{2}$	79.85	$4\frac{1}{8}$	$2\frac{3}{4}$
$3\frac{9}{8}$	39.95	$4\frac{7}{8}$	$1\frac{1}{2}$	6	80.90	$4\frac{1}{8}$	$2\frac{3}{4}$

For Arbors and extra Blades, see page 1040.

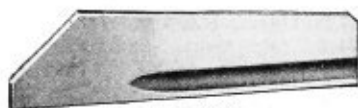


FIG. 3242

BLADES FOR SUPER REAMERS

It is important in ordering blades to give both the diameter and the figure number of the reamer for which the blades are intended.

BLADES FOR NOS. 20 AND 21 REAMERS				BLADES FOR NO. 18 REAMERS			
Fitting Reamers of Following Diameters	Number in Set	Price Per Set, High Speed	Price Per Set, Carbon Steel	Fitting Reamers of Following Diameters	Number in Set	Price Per Set, High Speed	Price Per Set, Carbon Steel
$1\frac{1}{8}$ to 1	6	\$ 5.50	\$ 2.75	$1\frac{1}{8}$ to 1	6	\$ 6.75	\$ 3.75
$1\frac{1}{16}$ to $1\frac{1}{4}$	6	6.25	3.00	$1\frac{1}{16}$ to $1\frac{1}{4}$	6	7.50	4.00
$1\frac{1}{8}$ to $1\frac{1}{2}$	6	7.50	3.50	$1\frac{1}{8}$ to $1\frac{1}{2}$	6	8.75	4.50
$1\frac{1}{16}$ to $1\frac{3}{4}$	6	9.00	4.00	$1\frac{1}{16}$ to $1\frac{3}{4}$	6	10.50	5.25
$1\frac{1}{8}$ to 2	6	10.50	5.00	$1\frac{1}{8}$ to 2	8	14.00	7.00
$2\frac{1}{16}$ to 3	6	12.50	6.00	$2\frac{1}{16}$ to 2	8	16.60	8.75
.....	.....	.....	.....	$2\frac{1}{8}$ to 2	8	18.00	10.00
.....	.....	.....	.....	$2\frac{1}{8}$ to 3	10	22.50	12.50

BLADES FOR NO. 24 REAMERS

Fitting Reamers of Following Diameters	Number in Set	Price Per Set, High Speed	Price Per Set, Carbon Steel
$1\frac{1}{8}$ to $1\frac{1}{4}$	6	\$ 5.50	\$ 2.75
$1\frac{1}{16}$ to $1\frac{1}{2}$	6	6.25	3.00
$1\frac{1}{8}$ to $1\frac{3}{4}$	6	7.50	3.50
$1\frac{1}{16}$ to 2	6	9.00	4.00
$2\frac{1}{16}$ to $2\frac{1}{2}$	6	10.50	5.00
$2\frac{1}{8}$ to $3\frac{1}{4}$	6	12.50	6.00
$3\frac{1}{16}$ to $4\frac{1}{2}$	8	16.60	8.00
$4\frac{1}{8}$ to $5\frac{1}{4}$	10	20.80	10.00
$5\frac{1}{16}$ to 6	12	25.00	12.00

ARBORS FOR NO. 24 SUPER REAMERS

No. 40



FIG. 3243

No. 41

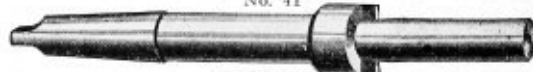


FIG. 3244

Size Number	Fitting Reamer Sizes	Price Each, No. 40	Price Each, No. 41	Length Over All
70	$1\frac{1}{8}$ to $1\frac{1}{4}$	\$4.80	\$5.80	10
71	$1\frac{1}{16}$ to $1\frac{1}{2}$	5.30	6.30	10
72	$1\frac{1}{8}$ to $1\frac{3}{4}$	5.80	6.80	11
73	$1\frac{1}{16}$ to $2\frac{1}{4}$	6.40	7.50	12
74	$2\frac{1}{16}$ to $2\frac{3}{8}$	7.00	8.10	13
75	$2\frac{1}{8}$ to $2\frac{5}{8}$	7.60	8.70	$13\frac{1}{2}$
76	$2\frac{1}{4}$ to $2\frac{3}{4}$	8.20	9.40	14
77	$2\frac{3}{8}$ to $2\frac{7}{8}$	9.00	10.20	$14\frac{1}{2}$
78	$2\frac{1}{2}$ to $3\frac{1}{4}$	9.60	10.90	15
79	$3\frac{1}{8}$ to $3\frac{5}{8}$	10.20	11.60	$15\frac{1}{2}$
80	$3\frac{1}{4}$ to $3\frac{3}{4}$	10.80	12.20	16
81	$3\frac{3}{8}$ to 4	11.40	13.00	$16\frac{1}{2}$
82	$4\frac{1}{4}$ to $4\frac{5}{8}$	12.00	13.75	17
83	$4\frac{1}{2}$ to $5\frac{1}{4}$	13.00	14.75	$17\frac{1}{2}$
84	$5\frac{1}{8}$ to $5\frac{3}{4}$	14.50	16.50	18
85	$5\frac{1}{4}$ to 6	16.00	18.50	18

SPIRAL FLUTED BURRING REAMERS

No. 246

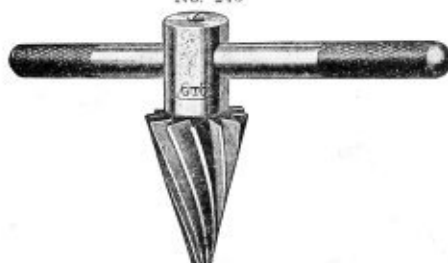


FIG. 3245

No. 243



FIG. 3246

Nos. 241, 242, 242½, 244



FIG. 3247

No. 1 and 2, Straight Flute



FIG. 3248

These Burring Reamers are made of finest steel and designed especially for removing burrs from pipe, caused by cutting. They are also extensively used for countersinking.

Great care is taken in grinding these tools to adapt them for use in a variety of materials.

Order by this No.	Price Each	Price Per Dozen	Style of Shank	Capacity Pipe, Inches
241	\$1.00	\$12.00	Bit Brace	$\frac{1}{8}$ to $\frac{1}{2}$
242	1.25	14.00	Bit Brace	$\frac{1}{4}$ to 1
242½	1.50	17.00	Bit Brace	$\frac{1}{4}$ to 1¼
243	1.50	17.00	½ Round	$\frac{1}{4}$ to 1¼
244	3.00	36.00	Bit Brace	$\frac{1}{2}$ to 2
246	4.00	48.00	T Handle	$\frac{1}{2}$ to 2
249	2.25	27.00	Bit Brace	$\frac{1}{2}$ to 2
1	1.50	17.00	Bit Brace	$\frac{1}{4}$ to 1¼
2	3.00	35.00	Bit Brace	$\frac{1}{2}$ to 1

Extra cutters for No. 249, each, 12 cents.

TAPER AND STRAIGHT PIPE TAPS AND TAPER PIPE REAMERS



FIG. 3249



FIG. 3250

PRICES EITHER STYLE

Size Inches	No. Threads Pipe Taps	Price Each
$\frac{1}{8}$	27	\$1.00
$\frac{1}{4}$	18	1.20
$\frac{3}{8}$	18	1.60
$\frac{1}{2}$	14	2.00
$\frac{3}{4}$	14	2.80
1	11 $\frac{1}{2}$	4.40
1 $\frac{1}{4}$	11 $\frac{1}{2}$	5.50
1 $\frac{1}{2}$	11 $\frac{1}{2}$	6.60
2	11 $\frac{1}{2}$	10.00
2 $\frac{1}{2}$	8	15.00
3	8	22.50
3 $\frac{1}{2}$	8	30.00
4	8	45.00



FIG. 3251

PIPE TAPS AND REAMERS WITH INSERTED LANDS

This type of pipe tap and reamer consists of a center or body, lands and wedges for securing the lands in place. The lands are made of a superior quality of steel.

New lands may be obtained to replace old ones at a mere fraction of cost of a new solid tap or reamer.

Briggs standard right-hand taper pipe taps are furnished unless otherwise specified. British (Whitworth) right-hand threads furnished at regular prices.

Straight Pipe Taps and Reamers will be furnished at regular prices.

When ordering new lands, state cutting size desired.

Taps of this type can be furnished in any size, pitch or thread not listed at special prices.

Size Inches	Price Each	Briggs Standard	Whit. Standard	Length of Thread	Length Over All	Price Per Set of Lands
2 $\frac{1}{4}$	\$12.00	...	11	2 $\frac{1}{2}$	5	\$6.50
2 $\frac{1}{2}$	15.00	8	11	2 $\frac{1}{2}$	5	6.50
2 $\frac{3}{4}$	18.00	...	11	2 $\frac{1}{2}$	5	7.00
3	22.50	8	11	2 $\frac{5}{8}$	5 $\frac{1}{2}$	7.50
3 $\frac{1}{4}$	25.50	...	11	2 $\frac{5}{8}$	5 $\frac{1}{2}$	7.50
3 $\frac{1}{2}$	30.00	8	11	2 $\frac{5}{8}$	5 $\frac{1}{2}$	7.50
3 $\frac{3}{4}$	36.00	8	11	2 $\frac{5}{8}$	5 $\frac{1}{2}$	8.50
4	45.00	8	11	2 $\frac{5}{8}$	5 $\frac{1}{2}$	8.50
4 $\frac{1}{2}$	55.00	8	11	2 $\frac{3}{4}$	6	9.00
5	65.00	8	11	2 $\frac{3}{4}$	6	9.00
5 $\frac{1}{2}$	75.00	...	11	2 $\frac{3}{4}$	6	10.00
6	85.00	8	11	2 $\frac{3}{4}$	6 $\frac{1}{2}$	10.00

Prices for sizes larger than 6 inches furnished on application.

PIPE HOBS

No. 315

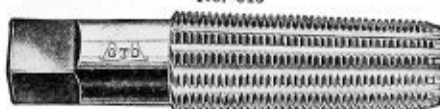


FIG. 3252

Briggs Standard right hand pipe hobs are furnished unless otherwise specified. Sizes, lengths and threads not listed are subject to special prices. Left hand hobs are special.

Nominal Size, Inches	Price Each	Number of Threads to the Inch		Length of Thread, Inches	Length Over All, Inches
		Briggs Std.	Whit. Std.		
$\frac{1}{8}$	\$1.75	27	28	2	$3\frac{1}{8}$
$\frac{1}{4}$	2.00	18	19	$2\frac{1}{2}$	$3\frac{1}{2}$
$\frac{3}{8}$	2.30	18	19	$2\frac{3}{8}$	$3\frac{3}{8}$
$\frac{1}{2}$	2.75	14	14	$2\frac{1}{2}$	$4\frac{1}{8}$
$\frac{3}{4}$	3.25	14	14	$2\frac{1}{2}$	$4\frac{1}{2}$
1	4.00	$11\frac{1}{2}$	11	$3\frac{3}{8}$	$5\frac{1}{2}$
$1\frac{1}{4}$	5.00	$11\frac{1}{2}$	11	$3\frac{3}{8}$	$5\frac{3}{4}$
$1\frac{1}{2}$	6.60	$11\frac{1}{2}$	11	$3\frac{3}{8}$	$5\frac{7}{8}$
2	10.00	$11\frac{1}{2}$	11	$3\frac{3}{8}$	6
$2\frac{1}{2}$	12.00	8	11	$4\frac{1}{8}$	$7\frac{1}{8}$
3	22.50	8	11	$4\frac{1}{8}$	$7\frac{3}{8}$
$3\frac{1}{2}$	30.00	8	11	$4\frac{1}{8}$	$7\frac{7}{8}$
4	45.00	8	11	$4\frac{1}{8}$	$7\frac{7}{8}$

MUELLER PIPE END REAMERS

Ratchet Pattern

Plain Pattern



FIG. 3253

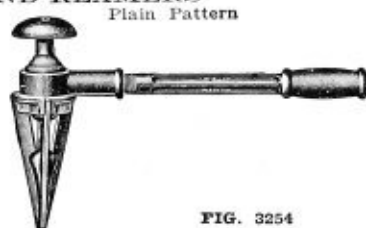


FIG. 3254

The ends must be reamed after cutting if the full carrying capacity is to be retained.

Pipe cutters leave a burr which is an obstruction to a free flow through the pipe, and reduces the pipe area as follows:

Size of Pipe, Inches	Inside Diameter, Inches	Diameter at Burr, Inches	Area if Not Reamed Per Cent Loss of
$\frac{1}{4}$	$\frac{23}{32}$	$\frac{1}{4}$	59.4
$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{8}$	43.8
$\frac{1}{2}$	$\frac{5}{8}$	$\frac{1}{2}$	31.2
$\frac{3}{4}$	$\frac{23}{32}$	$\frac{23}{32}$	28.0
1	$1\frac{1}{8}$	$\frac{23}{32}$	22.5
$1\frac{1}{4}$	$1\frac{1}{8}$	$1\frac{1}{8}$	13.2
$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	15.0
2	$2\frac{1}{8}$	$1\frac{1}{2}$	7.01

The ratchet used with No. 2 is so constructed that the strain is divided into half a dozen bearings, greatly increasing the durability of the tool. Reams pipe from $\frac{3}{8}$ to 3 inches, inclusive.

Price, No. 1, Plain each \$6.00

Price, No. 2, with Ratchet each 7.50

Price, Small Pattern, with Ratchet $\frac{3}{8}$ to $1\frac{1}{4}$ inches.....each 5.00

COMBINED PIPE TAP AND DRILL



FIG. 3254A

Size	Length	Price Each	Size	Length	Price Each
$\frac{1}{2}$	$4\frac{1}{4}$	\$3.00	$1\frac{1}{4}$	5	\$7.25
$\frac{3}{4}$	$4\frac{1}{2}$	4.50	$1\frac{1}{2}$	$5\frac{1}{2}$	8.50
1	$4\frac{3}{4}$	6.00	2	$5\frac{3}{4}$	10.75

Shanks for sizes $\frac{1}{4}$ to $1\frac{1}{2}$ inches are $\frac{1}{4}$ inch by $\frac{1}{2}$ inch, and $1\frac{3}{4}$ inches long.
Shanks for sizes 2 and $2\frac{1}{2}$ inches are 1 inch by $\frac{3}{4}$ inch, and 2 inches long.

THE "GUN" TAP

No. 301



FIG. 3255

With every shipment of "Gun" Taps, detailed instructions are sent for grinding and maintaining the original shape and cutting angle.

V thread taps are special. Left hand taps are special. Other sizes and pitches than those listed below can be furnished.

A. S. M. E. STANDARD

Screw Gage No.	Price Each	No. Threads to the Inch		Screw Gage No.	Price Each	No. Threads to the Inch	
		Std.	Also fur- nished			Std.	Also fur- nished
3	\$0.50	56	48	10	\$0.40	30	24, 28, 32
4	.40	48	32, 36, 40	12	.45	28	24, 32
5	.35	44	36, 40	14	.45	24	20
6	.35	40	32, 36	16	.45	22	20
7	.35	36	30, 32	18	.50	20	18
8	.35	36	30, 32, 40	20	.50	20	16, 18
9	.35	32	24, 30				

FRACTIONAL SIZES

Diameter Tap, Inches	Price Each	Number Threads to the Inch	
		U. S. Form	S. A. E. Std.
$\frac{1}{8}$	\$0.35	24, 30, 32	..
$\frac{1}{4}$	.45	20, 24, 32	28
$\frac{3}{8}$	.50	18, 20, 32	24
$\frac{1}{2}$	.55	16	24
$\frac{5}{8}$	.60	14	20
$\frac{3}{4}$	.70	13	20
$\frac{7}{8}$	.80	12	18
$\frac{15}{16}$	.90	11	18
$1\frac{1}{8}$	1.05	11	16
$1\frac{1}{4}$	1.20	10	16

MACHINISTS' HAND TAPS

Taper
FIG. 3256Plug
FIG. 3257Bottoming
FIG. 3258

U. S. Standard Threads furnished unless otherwise ordered.

Diameter of Tap Inches	Price		Number of Threads to the Inch			
			Standard Pitches			Other Pitches also Furnished
	Each	Per Set	U. S. Standard	S. A. E. Standard	Whit- worth Standard		U. S. Form
$\frac{1}{16}$	\$ 0.35	\$ 1.05	40	..	40	32
$\frac{1}{8}$	.35	1.05	40	..	..	..
$\frac{3}{16}$	.35	1.05	36	..	32	32
$\frac{1}{4}$	.35	1.05	32	..	..	..
$\frac{5}{16}$	.40	1.20	24	..	24	32
$\frac{3}{8}$	.40	1.20	24	..	..	..
$\frac{7}{16}$	.45	1.35	24	..	24	32
$\frac{1}{2}$	.45	1.35	24	..	..	27
$\frac{9}{16}$	.45	1.35	20	28	20	24, 32
$\frac{5}{8}$	.50	1.50	18	24	18	20, 27, 32
$\frac{3}{4}$	.55	1.65	16	24	16	20, 27
$\frac{7}{8}$	.60	1.80	14	20	14	24, 27
$1\frac{1}{8}$	.70	2.10	13	20	12	12, 24, 27
$1\frac{1}{4}$	.80	2.40	12	18	12	27
$1\frac{3}{8}$	.90	2.70	11	18	11	12, 27
$1\frac{1}{2}$	1.05	3.15	11	16	11	..
$1\frac{3}{4}$	1.20	3.60	10	16	10	12, 27
2	1.40	4.20	10	..	10	..
$2\frac{1}{8}$	1.60	4.80	9	14, 18	9	12, 27
$2\frac{1}{4}$	1.80	5.40	9	..	9	..
$2\frac{3}{8}$	2.00	6.00	8	14	8	12, 27
$2\frac{1}{2}$	2.25	6.75	7	12	7	..
$2\frac{3}{4}$	2.60	7.80	7	12	7	..
3	3.00	9.00	6	12	6	..
$3\frac{1}{8}$	3.50	10.50	6	12	6	..
$3\frac{1}{4}$	4.20	12.60	5 $\frac{1}{2}$	..	5	..
$3\frac{3}{8}$	5.00	15.00	5	..	5	..
$3\frac{1}{2}$	5.80	17.40	5	..	4 $\frac{1}{2}$	..
4	6.70	20.10	4 $\frac{1}{2}$	..	4 $\frac{1}{2}$	..
$4\frac{1}{8}$	8.00	24.00	4 $\frac{1}{2}$	..	4 $\frac{1}{2}$	..
$4\frac{1}{4}$	9.20	27.60	4 $\frac{1}{2}$	..	4	..
$4\frac{3}{8}$	10.50	31.50	4	..	4	..
$4\frac{1}{2}$	11.50	34.50	4	..	4	..

MACHINE SCREW TAPS



FIG. 3259

A. S. M. E. STANDARD

These Taps furnished in sets of taper, plug and bottoming, when desired.

Left-hand Taps are special.

Stay Bolt Tap

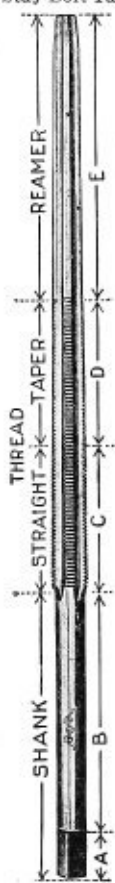


FIG. 3260

Screw Gauge No.	Basic Outside Diameter Inches	Price		Number of Threads to the Inch	
		Each	Per Dozen	Standard	Also Furnished
0	.060	\$0.50	\$6.00	80	..
1	.073	.50	6.00	72	64
2	.086	.45	5.40	64	56
3	.099	.40	4.80	56	48
4	.112	.40	4.80	48	36, 40
5	.125	.35	4.20	44	36, 40
6	.138	.35	4.20	40	32, 36
7	.151	.35	4.20	36	30, 32
8	.164	.35	4.20	36	30, 32
9	.177	.35	4.20	32	24, 30
10	.190	.40	4.80	30	24, 32
12	.216	.45	5.40	28	24
14	.242	.45	5.40	24	20
16	.268	.45	5.40	22	20
18	.294	.50	6.00	20	18
20	.320	.50	6.00	20	18
22	.346	.55	6.60	18	16
24	.372	.55	6.60	16	18
26	.398	.55	6.60	16	14
28	.424	.60	7.20	14	16
30	.450	.60	7.20	14	16

Shanks on No. 1 to No. 5, inclusive, are $\frac{1}{8}$ -inch diameter.

Shanks on No. 6 to No. 30, inclusive, are equal to the diameter of the outside of the thread.

STAY BOLT TAPS

In ordering, state diameter, pitch and form of thread, also length of parts A, B, C, D and E.

These Taps will be furnished in either U. S. form or V form of thread.

Diameter given is that of the thread at its straight part.

Prices are for each inch of length 16 inches and upwards.

Diameter of Tap, Inches	Price per Inch	Diameter of Tap, Inches	Price per Inch
$\frac{3}{4}$	\$0.40	$1\frac{3}{8}$	\$0.55
$\frac{5}{8}$	.40	$1\frac{1}{4}$	.55
$\frac{7}{8}$	.40	$1\frac{5}{8}$	.60
$\frac{1}{2}$	.45	$1\frac{3}{4}$	.60
1	.45	$1\frac{1}{2}$	.70
$1\frac{1}{8}$	.50	$1\frac{1}{2}$	.70
$1\frac{1}{4}$	.50		

Twelve thread standard. Can be furnished 10, 11 and 13 threads.

PATCH BOLT TAPS



FIG. 3261

All Taps have 12 threads to the inch and can be furnished in either United States Standard form or V form of thread.

U. S. Std. threads furnished unless otherwise ordered.

Diameter of Tap Inches	Price Each	Length Over all Inches	Diameter of Tap Inches	Price Each	Length Over all Inches
$\frac{1}{2}$	\$1.00	3	$\frac{5}{16}$	\$2.40	3
$\frac{9}{16}$	1.10	3	1	2.80	3
$\frac{5}{8}$	1.25	3	$1\frac{1}{16}$	2.90	$3\frac{1}{2}$
$\frac{11}{16}$	1.45	3	$1\frac{1}{8}$	3.00	$3\frac{1}{2}$
$\frac{3}{4}$	1.70	3	$1\frac{3}{16}$	3.15	$3\frac{1}{2}$
$\frac{7}{8}$	1.95	3	$1\frac{1}{4}$	3.35	$3\frac{1}{2}$
$\frac{15}{16}$	2.25	3			

STRAIGHT AND TAPER BOILER TAPS

Straight, No. 326



FIG. 3262

Taper, No. 317



FIG. 3263

Taper Boiler Taps have a taper of $\frac{3}{4}$ inch to the foot and the diameter is measured $\frac{5}{8}$ inch from the large end of the thread.

All Taps have 12 threads to the inch and can be furnished in either United States Standard form or V form of thread.

U. S. Std. threads furnished unless otherwise ordered.

Diameter of Tap Inches	Price Each	Length Over all Inches	Diameter of Tap Inches	Price Each	Length Over all Inches
$\frac{1}{2}$	\$1.05	$4\frac{1}{2}$	$1\frac{3}{16}$	\$3.85	7
$\frac{9}{16}$	1.25	$4\frac{5}{8}$	$1\frac{1}{4}$	4.05	$7\frac{1}{8}$
$\frac{5}{8}$	1.40	5	$1\frac{5}{16}$	4.35	$7\frac{1}{4}$
$\frac{11}{16}$	1.60	$5\frac{1}{4}$	$1\frac{3}{8}$	4.70	$7\frac{3}{8}$
$\frac{3}{4}$	1.95	$5\frac{1}{2}$	$1\frac{7}{16}$	5.30	$7\frac{1}{2}$
$\frac{7}{8}$	2.25	$5\frac{3}{4}$	$1\frac{1}{2}$	5.50	$7\frac{5}{8}$
$\frac{15}{16}$	2.50	6	$1\frac{5}{8}$	5.80	$7\frac{3}{4}$
1	2.80	$6\frac{1}{4}$	$1\frac{3}{4}$	6.10	$7\frac{7}{8}$
$1\frac{1}{16}$	3.35	$6\frac{1}{2}$	$1\frac{7}{8}$	6.40	8
$1\frac{1}{8}$	3.50	$6\frac{3}{4}$	2	6.70	8
$1\frac{1}{4}$	3.65	$6\frac{7}{8}$			

NUT TAPS

No. 306



FIG. 3364

U. S. Std. threads furnished unless otherwise ordered.
Left-hand Taps are special.

Diameter Tap Inches	Price Each	Number of Threads to the Inch			Length Over all, Inches
		U. S. Standard	S. A. E. Standard	Whit. Standard	
$\frac{1}{16}$	\$ 0.60	24, 32	..	24	4 $\frac{1}{2}$
$\frac{1}{8}$	.60	20	28	20	5
$\frac{3}{16}$	.70	18	24	18	5 $\frac{1}{2}$
$\frac{1}{4}$	.80	16	24	16	6
$\frac{5}{16}$	.90	14	20	14	6 $\frac{1}{2}$
$\frac{3}{8}$	1.00	13	20	12	7
$\frac{7}{16}$	1.15	12	18	12	7 $\frac{1}{2}$
$\frac{1}{2}$	1.30	11	18	11	8
$\frac{9}{16}$	1.60	11	16	11	8 $\frac{1}{2}$
$\frac{5}{8}$	1.85	10	16	10	9
$\frac{11}{16}$	2.15	10	..	10	9 $\frac{1}{2}$
$\frac{3}{4}$	2.45	9	14, 18	9	10
$\frac{7}{8}$	2.80	9	..	9	10 $\frac{1}{2}$
1	3.15	8	14	8	11
1 $\frac{1}{8}$	3.70	7	12	7	11 $\frac{1}{2}$
1 $\frac{1}{4}$	4.50	7	12	7	12
1 $\frac{3}{8}$	5.50	6	12	6	12 $\frac{1}{2}$
1 $\frac{1}{2}$	6.75	6	12	6	13
1 $\frac{3}{4}$	8.00	5 $\frac{1}{2}$	..	5	13 $\frac{1}{2}$
1 $\frac{7}{8}$	9.25	5	..	5	14
2	10.75	5	..	4 $\frac{1}{2}$	14 $\frac{1}{2}$
2 $\frac{1}{8}$	12.25	4 $\frac{1}{2}$	..	4 $\frac{1}{2}$	15
2 $\frac{1}{4}$	14.00	4 $\frac{1}{2}$	..	4 $\frac{1}{2}$	15 $\frac{1}{2}$
2 $\frac{1}{2}$	15.75	4 $\frac{1}{2}$	..	4	16
2 $\frac{3}{8}$	17.75	4	..	4	16 $\frac{1}{2}$
2 $\frac{1}{2}$	20.00	4	..	4	17

STOVE BOLT TAPS



FIG. 3365

Diameter of Tap, Inches	Price		Number of Threads to the Inch
	Each	Per Dozen	
$\frac{1}{8}$	\$0.40	\$4.20	24
$\frac{1}{4}$	.45	5.40	18
$\frac{3}{8}$	.50	6.00	18
$\frac{1}{2}$	.55	6.60	16

SHORT DIE HOB TAPS



FIG. 3267

THE SHORT DIE HOB TAPS ARE FOR CUTTING OPEN DIES

Diam.	Total Length, Inches Short Plug	Number of Threads to Inch				Price Each Short Plug
		U. S. Std.	S. A. E. Std.	Whit. Std.	"V" Form	
$\frac{1}{4}$	$2\frac{1}{2}$	20	28	20	20	\$0.65
$\frac{1}{8}$	$2\frac{5}{8}$	18	24	18	20	.70
$\frac{3}{8}$	$2\frac{7}{8}$	16	24	16	16	.80
$\frac{7}{16}$	$3\frac{1}{8}$	14	20	14	14	.90
$\frac{1}{2}$	$3\frac{3}{8}$	13	20	12	12	1.00
$\frac{9}{16}$	$3\frac{5}{8}$	12	18	12	12	1.15
$\frac{5}{8}$	$3\frac{11}{8}$	11	18	11	11	1.30
$\frac{11}{16}$	4	11	16	11	11	1.45
$\frac{3}{4}$	$4\frac{1}{4}$	10	16	10	10	1.70
$\frac{13}{16}$	$4\frac{7}{16}$	10	..	10	10	1.95
$\frac{7}{8}$	$4\frac{11}{16}$	9	14, 18	9	9	2.25
$\frac{15}{16}$	$4\frac{7}{8}$	9	..	9	9	2.50
1	$5\frac{1}{8}$	8	14	8	8	2.80
$1\frac{1}{8}$	$5\frac{7}{8}$	7	12	7	7	3.20
$1\frac{1}{4}$	$5\frac{11}{8}$	7	12	7	7	3.70
$1\frac{3}{8}$	6	6	12	6	6	4.20
$1\frac{1}{2}$	$6\frac{1}{4}$	6	12	6	6	4.70
$1\frac{5}{8}$	$6\frac{7}{8}$	$5\frac{1}{2}$	..	5	..	5.30
$1\frac{3}{4}$	6 $\frac{11}{8}$	5	..	5	..	6.00
$1\frac{7}{8}$	$7\frac{1}{8}$	5	..	$4\frac{1}{2}$	..	6.80
2	$7\frac{3}{8}$	$4\frac{1}{2}$	..	$4\frac{1}{2}$	..	7.70

TAPPER TAPS

No. 307



FIG. 3269

The threads of these taps are chamfered back from the point two-thirds length of the threaded portion.

Tapper taps are furnished with several styles of shanks to fit the holders of machines in common use.

Specify size, length, form of thread and style of shank.

U. S. Standard threads furnished unless otherwise ordered.

Sizes, lengths and threads not listed are subject to special prices.

Left hand taps are special.

SIZES AND PRICES

Diam. Tap Inches	Length Over All—Price Each				No. Threads to the Inch	
	11 Inches	12 Inches	14 Inches	15 Inches	U. S. Standard	S. A. E. Standard
$\frac{1}{4}$	\$0.70	\$0.75	\$0.80	\$0.90	20	28
$\frac{5}{16}$	.80	.85	.90	1.00	18	24
$\frac{3}{8}$	.90	.95	1.00	1.10	16	24
$\frac{7}{16}$	1.00	1.05	1.15	1.25	14	20
$\frac{1}{2}$	1.10	1.15	1.25	1.35	13	20
$\frac{9}{16}$	1.30	1.35	1.45	1.55	12	18
$\frac{5}{8}$	1.45	1.50	1.65	1.75	11	18
$\frac{11}{16}$	1.65	1.70	1.80	1.95	11	16
$\frac{3}{4}$	1.90	1.95	2.00	2.10	10	16
$\frac{13}{16}$	2.15	2.20	2.25	2.35	10	..
$\frac{7}{8}$	2.45	2.50	2.60	2.75	9	14, 18
$\frac{15}{16}$	2.80	2.90	3.00	3.15	9	..
1	3.15	3.30	3.50	3.65	8	14
$1\frac{1}{8}$	3.60	3.70	4.00	4.15	7	12
$1\frac{1}{4}$	4.20	4.50	4.90	5.10	7	12
$1\frac{3}{8}$	4.80	5.15	5.75	6.00	6	12
$1\frac{1}{2}$	5.75	6.25	7.05	7.35	6	12
$1\frac{5}{8}$	6.40	6.95	8.00	8.35	$5\frac{1}{2}$	..
$1\frac{3}{4}$	7.40	8.00	9.25	9.65	5	..
$1\frac{7}{8}$	8.25	8.90	10.15	10.75	5	..
2	9.10	9.90	11.50	12.25	$4\frac{1}{2}$	..

PULLEY TAPS

No. 308



FIG. 3270

Pulley Taps are regularly furnished in plug style only.

U. S. Standard threads furnished unless otherwise ordered.

Sizes, lengths and threads not listed are subject to special prices.

Left hand taps are special.

Diam. Tap, Inches	Length Over All—Price Each					No. Threads to the Inch U. S. Std.
	6 Inch	8 Inch	10 Inch	12 Inch	14 Inch	
$\frac{1}{4}$	\$0.65	\$0.70	.....	.....	.....	20
$\frac{1}{8}$	.70	.75	.....	.....	.....	18
$\frac{3}{8}$	.80	.85	\$0.90	\$0.95	\$1.00	16
$\frac{7}{8}$	.85	.95	1.00	1.05	1.15	14
$\frac{1}{2}$	.95	1.05	1.10	1.15	1.25	13
$\frac{1}{16}$	1.00	1.15	1.25	1.35	1.45	12
$\frac{5}{8}$	1.00	1.35	1.40	1.50	1.65	11
$\frac{3}{4}$	.....	.....	1.85	1.95	2.00	10

HORSESHOE CALK TAPS

Hand Tap No. 1900



FIG. 3271

Hand Tap No. 1901



FIG. 3272

These taps are furnished in two styles, namely: Hand Horseshoe Calk Taps and Tapper Horseshoe Calk Taps.

Hand taps always sent unless otherwise ordered.

The threads on these taps are United States Standard form.

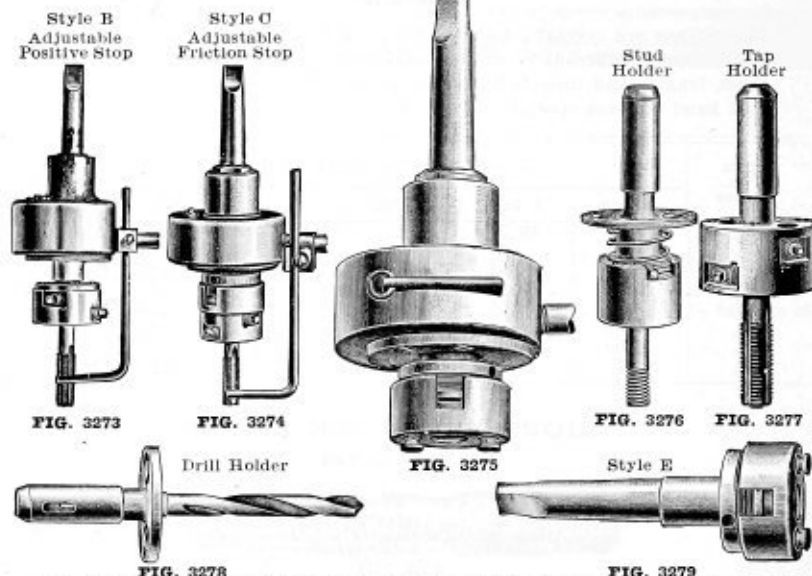
Sizes, lengths and threads not listed are subject to special prices.

Left hand taps are special.

Diameter of Tap, Inches	Price Each		Number of Threads to the Inch
	Hand No. 1900	Tapper No. 1901	
$\frac{1}{8}$	\$0.50	\$0.70	18
$\frac{3}{8}$	.55	.70	18
$\frac{1}{2}$	.60	.70	16
$\frac{3}{4}$	.70	.70	14
$\frac{1}{16}$	.80	.80	12
$\frac{5}{8}$	.90	.90	12

ERRINGTON QUICK-CHANGE FRICTION TAPPING CHUCKS STYLES D & E

Style D. Interchangeable
Drill, Tap and Stud Holders



Drill, Tap and Set Studs without stopping drill press and without moving work. Self-Centering, Double-Grip Tap-Holder; Morse Taper Socket Drill-Holder. Stud-Setter has interchangeable stud-net. Tools inserted and withdrawn while Spindle is rotating, without danger of turning in operator's hand. Only one hand required to change tools. Makes drill press a Vertical Turret Machine.

ERRINGTON AUTO-REVERSE TAPPING CHUCKS STYLES B, C & D.

Require no reversing mechanism on the drill press, as they drive the tap in, stop automatically at the depth gauged, and back the tap out with quick return by simply raising the drill spindle. The different styles are secured by inserting any one of the Duplex Tap Chucks desired, without changing the very simple steel spur quick-reverse gear-box.

Use Style B for through holes in cast iron, brass, etc., or where blind holes can be drilled deep enough to safely use a positive stop.

Style C has an adjustable friction tap-holder that renders it "Fool-Proof" against breaking taps in tapping steel, copper, etc.

Style D gives a Quick-Change Vertical Turret on a Non-Reversing drill press, for drilling, tapping, stud-setting, etc., in line without moving the work.

Style E is a Quick-Change Friction Tool Holder required on every tapping drill press for drilling, tapping and stud-setting.

Size	Number	00	0	1	2	3	4	5
Taps—Standard	Inches	$\frac{1}{16}$ — $\frac{3}{8}$	$\frac{1}{8}$ — $\frac{1}{2}$	$\frac{3}{8}$ — $\frac{1}{2}$	$\frac{1}{2}$ — 1	$\frac{3}{4}$ — $1\frac{1}{4}$	$1\frac{1}{2}$ — 2	$2\frac{1}{2}$ — 3
Taps—Pipe	Inches	$\frac{1}{16}$ — $\frac{1}{2}$	$\frac{1}{4}$ — $\frac{3}{4}$	$\frac{1}{2}$ — 1	$\frac{3}{4}$ — 2	$1\frac{1}{2}$ — 3	2 — 4	3 — 6
Morse Taper Shank	Number	1, 2	3, 2, 1*	3, 4	4, 3*	4, 3*	5, 4	5, 4*
Style B. Pos. Tap Hldr. and Stop..	Each	\$25.00	\$30.00	\$35.00	\$40.00	\$50.00	\$70.00	\$80.00
Style C. Fric. Tap Hldr. and Stop..	Each	30.00	35.00	40.00	50.00	60.00	80.00	90.00
Style D. Friction Interchangeable Drill and Tap Holders	Each			55.00	65.00	75.00	90.00	100.00
Stud-Setter fitted to Styles D & E..	Each			12.50	15.00	17.50	20.00	22.50
Style E. Interchangeable Drill and Tap Holder	Each			40.00	50.00	60.00	70.00	80.00

The first size of Morse Taper Shank given above for each size is one regularly furnished; the other sizes can be furnished, but the size marked (*) is too small to be used unless it is reinforced by a set-screw.

ERRINGTON AUTO-OPENING AND ADJUSTABLE DIE HEADS

Styles A & E for Turret

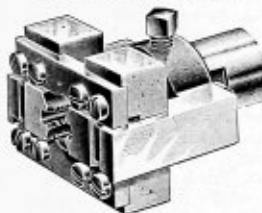


FIG. 3280

closing the Dies Axially (all other heads make quarter-turn to close dies) permit a Universal Adaptability of the Errington Die to every requirement of screw-cutting,

either as a Rotary (Styles B, C & D) or Stationary (Styles A & E) Device.

Use Style A as a Stationary Die for Turret and all other purposes where Style E (which is especially designed to cut Parallel Threads close up to shoulder) is not required;

Styles A & E can also be used in tail-stock or tool-post of engine lathe, etc.

Style B as a Rotary Die on live spindle of lathe, bolt-cutter, etc.

Style C as a Rotary Die having a self-centering guide that avoids chucking the work and brings the threads true with the rough stock.

Style D for screw-cutting on drill press.

Dies are relieved—just like four chasers.

Dies are furnished U. S. S. when ordered exact size, and V when ordered 1/16 inch oversize; all special pitches are understood to be V thread.

Dies for shoulder work are ground with short start; for rod work can be given a longer and more durable start.



FIG. 3283

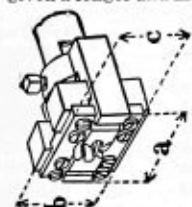


FIG. 3281

In ordering Die Chucks, kindly give diameter of hole in your turret (to fit shank to) and name length of thread on largest diameter of work (to bore shank out for).

In ordering Dies, please state diameter, pitch, right or left, and style of thread (V, U. S. S. or W.) desired. Send a sample wherever possible, or inform us whether for rod or shoulder work, and the metal to be cut.

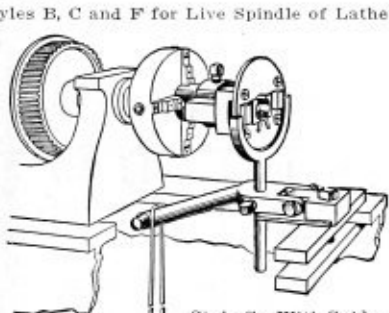


FIG. 3282

Style C. With Guide.



FIG. 3282

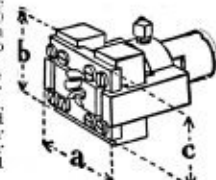


FIG. 2.

No.	Size Dies, Inches		Size Shank	Dimensions For Turret, In.			Price includes one pair Standard Pitch Carbon Dies								Extra Carbon Steel Dies, Per Pr. Net	
	Exact	Pipe	Stock Diam.	Stock Bore	A	B	C	Turret		Rotary for Lathe or Drill						
			Style A	Style E				Style B	Style C	Style D	Style F					
1	1/8 to 3/8	1/8 to 3/8	1 1/4	1 1/4	3 1/2	2 1/4	1 1/2	\$30.00	35.00	35.00	2.50	35.00	40.00	40.00	1.50	
2	3/8 to 1	3/8 to 1	1 3/4	1 3/4	4 1/2	2 3/4	2 3/4	40.00	45.00	45.00	3.00	45.00	50.00	50.00	2.00	
3	1 to 1 1/2	1 to 1 1/2	2 1/4	2 1/4	5 1/2	3 1/4	2 7/8	50.00	55.00	55.00	3.50	55.00	60.00	60.00	2.50	
4	1 1/2 to 2	1 1/2 to 2	3 1/4	3 1/4	6 1/2	4 1/4	3 1/2	60.00	65.00	65.00	4.00	65.00	70.00	70.00	4.00	
5	2 to 2 1/2	2 to 2 1/2	4 1/4	4 1/4	7 1/2	5 1/4	4 1/4	90.00	95.00	95.00	4.00	95.00	100.00	100.00	5.00	

From center of turret hole to top of turret slide is one-half of "A" when held edge ways. From center of turret hole to top of turret slide is one-half of "B" when held flat. To pass between parting and forming tools is "C."

WIZARD CHUCKS AND COLLETS

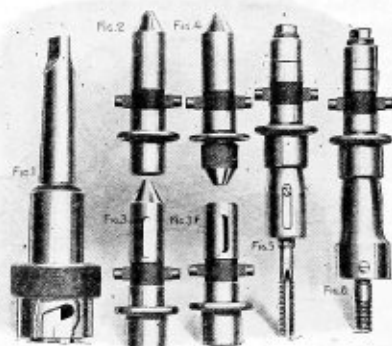


FIG. 3284

For using all sizes and kinds of tools in rapid succession without stopping machine. Outfit consists of one chuck for the drill press spindle and a collet for each tool in the series of operations. Fig. 1 shows chuck with taper shank to fit spindle. Fig. 2 shows a blank collet which is sent soft for boring out. Fig. 3 shows the regular Morse Taper Collet which fits any Morse Taper Shank Tool. Fig. 3F shows a special style of floating collet which will be furnished if desired. Only furnished when specified. Fig. 4 shows an adjustable collet for small straight shank drills. Fig. 5 shows a friction tapping collet. Friction slips when tap bottoms. Fig. 6 shows a friction stud-setting collet.

Size	Size of Chuck Shank	WIZARD CHUCKS		Diam. of Lar. Diam.		Price Each
		Range of No. 3 Collet		Collet In.	Chuck In.	
A	Morse Taper 2 or 3	Morse Taper 1 and 2		1 1/8	2 3/8	\$ 9.00
B	Morse Taper 3 or 4	Morse Taper 1, 2 and 3		1 1/4	2 1/2	12.00
C	Morse Taper 4 or 5	Morse Taper 1, 2, 3 and 4		1 1/2	3 1/8	18.00
D	Morse Taper 5 or 6	Morse Taper 1, 2, 3, 4 and 5		2 3/8	4 1/4	40.00

Specify which size Morse Taper Shank is required to fit spindle.

WIZARD COLLETS

In ordering, give number and state size chuck to be used with.

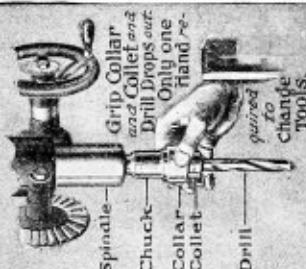
In ordering Nos. 61, 62 or 63 Collets (Fig. 6) give sizes of studs, pitch and style of threads; whether complete collet for each size stud, or extra bushings will be sufficient.

Collet No. Fig.	Description	Price, Each, for Chuck Size			
		A	B	C	D
20 2	Blank, to be Fitted for Tool by Purchaser.....	\$ 1.50	\$ 2.10	\$ 3.00	\$ 5.60
21 2	Fitted for Straight Shank Tool within its Range...	3.90	5.00	6.50	11.25
31 3	For Any Tool with No. 1 Morse Taper Shank.....	2.50	3.50	4.90	9.75
32 3	For Any Tool with No. 2 Morse Taper Shank.....	2.50	3.50	4.90	9.75
33 3	For Any Tool with No. 3 Morse Taper Shank.....	.....	3.50	4.90	9.75
34 3	For Any Tool with No. 4 Morse Taper Shank.....	.....	.....	4.90	9.75
35 3	For Any Tool with No. 5 Morse Taper Shank.....	.....	.....	.....	9.75
41 4	Takes Straight Shanks from 0 to 1/8 inch.....	3.75	4.25	4.60	.....
42 4	Takes Straight Shanks from No. 29 Drill to 1 1/8-inch.....	3.75	4.25	4.60	.....
43 4	Takes Straight Shanks from 1 1/8 to 1 1/2-inch.....	4.25	4.75	5.10	.....
51 5	Takes Beaman & Smith Shank Taps, 1/8 to 3/8-in.	8.60	10.50	13.00	23.25
52 5	Takes Beaman & Smith Shank Taps, 3/8 to 1/2-in.	8.60	10.50	13.00	23.25
53 5	Takes Beaman & Smith Shank Taps, 1/2 to 1 1/4-in.	.....	10.50	13.00	23.25
55 8	Fitted for Any Size Hand Tap from 3/8 to 1/2-inch..	11.00	12.75	15.50	25.60
56 8	Fitted for Any Size Hand Tap from 1/2 to 3/4-inch..	11.00	12.75	15.50	25.60
57 8	Fitted for Any Size Hand Tap from 3/4 to 1 1/4-inch.	.....	13.40	16.00	26.25
550 8	A Blank No. 55 Collet, to be Fitted for Tap by Pur.	10.00	11.75	14.25	24.40
560 8	A Blank No. 56 Collet, to be Fitted for Tap by Pur.	10.00	11.75	14.25	24.40
570 8	A Blank No. 57 Collet, to be Fitted for Tap by Pur.	.....	12.25	14.75	25.00
61 6	Fitted for Any Size Stud from 0 to 3/8-inch.....	16.00	18.00	20.00	30.00
62 6	Fitted for Any Size Stud from 3/8 to 1 1/8 inch.....	.....	20.00	22.00	32.00
63 6	Fitted for Any Size Stud from 1 to 1 1/2-inch.....	.....	.....	30.00	40.00

Extra bushings for No. 61 Collet fitted for any size stud from 0 to 3/8-inch, \$3.60 each, for No. 62 Collet fitted for any size stud from 3/8 to 1 1/8-inch, \$4.00 each, for No. 63 Collet fitted for any size stud from 1 to 1 1/2-inch, \$6.00 each, net.

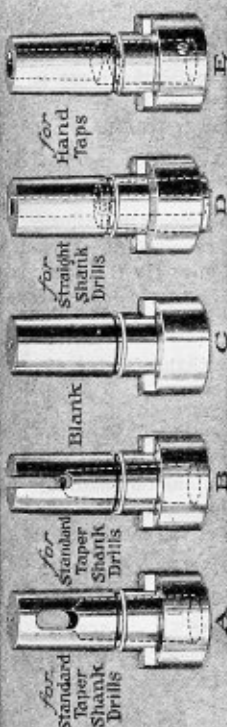


Collet has well known Use-Em-Up Type drive. No special bushing required to use up broken drills and a flat on the drill shank and the drill is better than when new. Use-Em-Up Type means more speed and increased production.



Bushings

NO.	BLANK D	FINISHED D
0	.30	.50
1	.30	.50
2	.35	.60
3	.45	.70
4	.65	.90
5	.85	1.10



THE "WONDER" QUICK CHANGE DRILL CHUCK

The "Wonder" Chuck can be used in the Spindle of Drill Press, Screw Machine, Lathe and all other revolving spindle machines.

The "Wonder" Chuck converts any single spindle machine into a multiple spindle and allows rapid change of tools without stopping machine.

The "Wonder" Chuck Equipment consists of Collets, holding various kinds of tools which can be inserted and withdrawn from chuck, making it possible for operator to complete several different operations on the same machine, which means increased production.

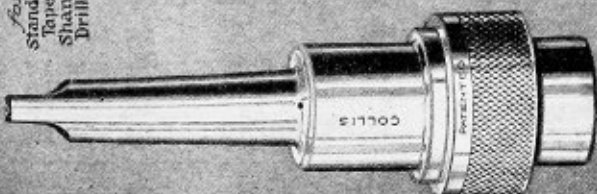
FIG. 3235

Collets

NO.	A & B	C	D	E	F	NO.
0	1.40	1.60	1.70	1.50	1.60	0
1	1.50	1.80	2.00	1.70	1.80	1
2	1.80	2.20	2.40	2.00	2.20	2
3	3.50	2.75	4.00	4.00	4.25	3
4	6.00	4.00	6.25	6.25	6.75	4
5	8.50	5.50	9.00	9.00	9.50	5

Chucks

NO.	PRICE	STANDARD TAPER SIZE OF SHANK	OUTSIDE DIAMETER	NO.
0	5.00	No. 1 and 2	1-1/8	0
1	6.00	No. 2-3 and 4	2	1
2	8.00	No. 3-4 and 5	2 1/2	2
3	12.00	No. 4-5 and 6	3 1/2	3
4	18.00	No. 4-5 and 6	3 3/4	4
5	35.00	No. 4-5 and 6	4 3/4	5



THE ACORN DIE AND HOLDERS

The Acorn Die, by means of its various holders, is adapted to all kinds of machines; lathes, drill presses, hand or automatic screw machines, turret lathes, bolt cutters, etc.

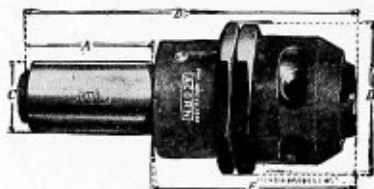


FIG. 3286

ADJUSTMENT

The adjusting cap is bevelled on the inside to fit the corresponding bevel on the prongs of the die. By turning this threaded cap the correct adjustment is instantly obtained, all the prongs converging equally toward the center.

When the adjustment is correct the cap is held in position by the lock nut immediately back of it.

INTERCHANGEABILITY

The die is held in perfect alignment with the shank. The dies are uniform in length. This means that once a machine is set, a die may be removed for sharpening, a new die set in its place and the machine is ready at once for threading to exactly the same length.

GRINDING

The Acorn Die can be ground even more easily and quickly than a spring die. The grinding is done in the flutes, on the cutting faces.

HOLDERS

All parts of the holders are made of steel and hardened.

The regular Acorn Die Holder shown above is of a smaller diameter than any other die holder of equal cutting size. It has a longitudinal float, permitting the die to follow its own lead independent of any lag in the travel of the machine.

REGULAR ACORN DIE HOLDERS

No. Holder	*No. Die	Price, Holder Only	Lengths		Diameters		Length Thread Will Cut, Inches
			Shank (A) Inches	Body Inc. Die (E) Inches	Shank (C) Inches	Body (D) Inches	
700	0	3.00	1½, 2	1½	⅝, ¾	1¼, 2	⅞
701	1	4.00	1½, 2	1½	⅝, ¾	1½	1½
702	2	5.00	2, 3	2⅞	⅞, 1	1¾	1½
703	3	10.00	3, 3	3½	1, 1¼	2½	2¾
704	4	15.00	3¼, 3¼	4⅞	1¼, 1½	2¾	3¾

*See table on following page for range of sizes.

ACORN DIES

In ordering dies specify both number and cutting size.



FIG. 3267

No. of Die	Price Each, Die	Range, Inches	Diameter of Blank, Inches	Length, Inches
0	\$1.50	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$
1	1.75	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{1}{2}$
2	2.00	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$
3	2.25	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{4}$
4	2.75	1	$1\frac{3}{4}$	$1\frac{3}{4}$

ACORN DIE RELEASING HOLDER



FIG. 3288

The releasing type of holder for the Acorn Die is of particular value where the die is required to cut threads of uniform length or close to shoulder.

The danger of accident to the die and set-up of the machine is minimized by the use of this holder.

On multiple spindle machines where the threading operation is shorter than some simultaneous operation the die—when it reaches the end of its cut—is released and revolves with the work until it is engaged by the reversing pins which back it off.

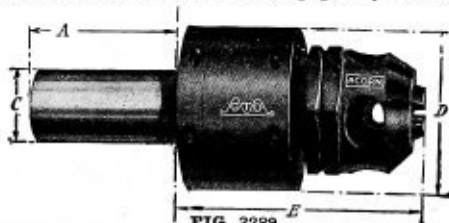


FIG. 3289

No. Holder	No. Die	Price Holder Only	Body		Shank		Length Thread Will Cut
			E	D	A	C	
720	0	\$ 9.00	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$\frac{1}{2}$	No Limit
					$1\frac{1}{2}$	$\frac{5}{8}$	No Limit
721	1	11.00	$2\frac{3}{16}$	$1\frac{5}{8}$	$1\frac{1}{8}$	$\frac{1}{2}$	No Limit
					$1\frac{1}{4}$	$\frac{5}{8}$	No Limit
					2	$\frac{3}{4}$	No Limit
					$1\frac{1}{4}$	$\frac{5}{8}$	No Limit
722	2	14.00	$2\frac{3}{4}$	2	$1\frac{1}{2}$	$\frac{3}{4}$	No Limit
					2	$\frac{7}{8}$	No Limit
					3	1	No Limit
					$1\frac{1}{2}$	$\frac{3}{4}$	*
723	3	18.00	$3\frac{1}{8}$	$2\frac{1}{2}$	$2\frac{1}{4}$	1	No Limit
					3	$1\frac{1}{4}$	No Limit
					$1\frac{3}{4}$	1	**
724	4	24.00	$4\frac{1}{2}$	$3\frac{3}{16}$	$1\frac{3}{4}$	$1\frac{1}{4}$	**
					$3\frac{1}{4}$	$1\frac{1}{2}$	No Limit

*No. 723— $\frac{3}{4}$ in. shank limited to $2\frac{3}{8}$ in. when cutting $\frac{1}{8}$ in. and larger. Unlimited under $\frac{1}{8}$ in.

**No. 724—1 in. shank limited to $3\frac{1}{2}$ in. when cutting $\frac{5}{8}$ in. and larger. Unlimited under $\frac{5}{8}$ in; $1\frac{1}{4}$ in. shank limited to $3\frac{1}{2}$ in. when cutting $\frac{7}{8}$ in. and larger. Unlimited under $\frac{7}{8}$ in.

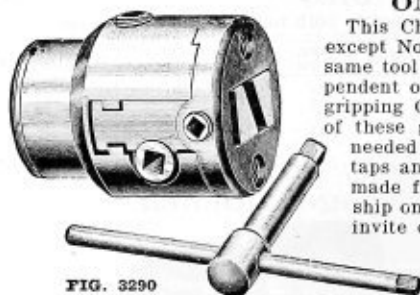


FIG. 3290

ONEIDA DRILL CHUCK

This Chuck is made with three distinct grips, except Nos. 18 and 19, that can be applied to the same tool at the same time, if necessary, or independent of each other, which makes it a positive gripping Chuck. It is not necessary to use each of these grips in all classes of work, but when needed it will be found very convenient to hold taps and tool positive. We guarantee it to be made from the best material. The workmanship on this Chuck is the best possible, and we invite comparison with any other similar tool.

Every Chuck guaranteed to be as represented. No. 22½ is made very heavy for extra hard work.

No.	Drill Capacity	Price	Diameter of Body	Length of Body	Screws	Jaws, Per Pair
18	0 to ¼	\$ 7.00	1 ⅞	2 ½	\$1.25	\$2.50
19	0 to ⅜	7.00	1 11⁄16	2 ½	1.25	2.85
20	0 to ½	8.00	2 ½	3 ½	1.30	2.90
21	0 to ¾	9.00	3	3 ¾	1.35	3.20
22	0 to 1	10.00	3 ½	3 ¾	1.45	3.50
22½	0 to 1	11.00	4	3 ¾	1.80	4.35
23	0 to 1½	18.00	6	4 ½	3.10	6.40
24	0 to 2	20.00	6 ½	4 ½	3.90	8.00

Nos. 23 and 24 Fitted for Face Plate.

CUSHMAN DRILL CHUCK

Two jaws. Interlocking teeth. Operated by right and left screw. Taper holes in back for arbor.



FIG. 3291

Chucks No.	0	00	1	2	3
Capacity .in.	0 to ¼	0 to ⅜	0 to ½	0 to ¾	1 to 1
Price	\$6.00	\$6.50	\$7.00	\$8.00	\$10.00
Diameter, in.	1 ½	1 ¾	2 ½	2 ¾	3 ¾
Length .in.	2 ½	2 ¾	2 ¾	3 ¾	4 ¾
Weight .lbs.	1 ¼	1 ¼	2 ½	5	9 ¼

EXTRA PARTS FOR REPAIRS

Chucks No.	0	00	1	2	3
Jaws pair	\$1.75	\$2.00	\$2.25	\$2.50	\$3.00
Screws	1.00	1.00	1.25	1.25	1.50
Wrench	.50	.50	.60	.75	1.00

When ordering Jaws or Screws for the No. 2 Chuck, please state whether the screw measures .653" or .723" in diameter. The size of screw determines the thickness of jaws.

All "Cushman" Drill Chucks are designed to be fitted to machine by means of a taper arbor. Sometimes chucks are threaded and screwed directly onto the spindle, but we do not recommend that chucks be fitted in such a manner, for the reason that the chuck cannot be easily repaired if the taper hole in the hub is changed in any way.

Geared Pattern

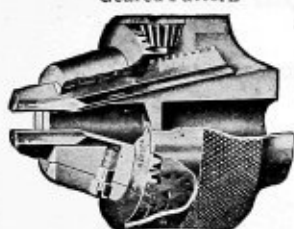


FIG. 3292

SKINNER DRILL CHUCKS

New Model

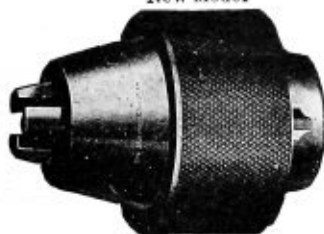


FIG. 3293

The Skinner Geared Pattern Drill Chuck is recommended for use on drills and lathes because of its accuracy and convenience. The gears are all enclosed beneath the surface (patented) of the chuck away from chips and dirt. The chuck is hand-operated save for final grip on drill, by means of a common wrench, which has no tendency to revolve the spindle of the lightest machine. It is made entirely of steel and of such grades as is best adapted to the different parts.

The Skinner New Model Drill Chuck is especially adapted for all light and rapid drilling, such as is done on sensitive drills and hand lathes, and where accuracy is required. The chuck is operated by hand, and tightened by means of a spanner wrench.

Style.....	Geared Pattern				New Model		
Number.....	21	22	23	24	11	12	13
Capacity.....inches	0 to 1/4	0 to 3/8	0 to 1/2	1/2 to 3/4	0 to 1/2	0 to 3/8	0 to 1/2
Diameter....."	1 5/8	2 1/8	2 3/4	3 1/2	1 3/8	1 5/8	2 1/8
Length....."	1 1/2	2 1/8	3 1/8	3 7/8	1 5/8	2 1/8	3 1/8
" Jaws Extended....."	2 1/8	2 5/8	4 1/8	5 1/8	2 1/8	2 5/8	4 1/8
Price.....each	\$7.00	\$8.00	\$11.00	\$20.00	\$5.50	\$5.50	\$9.00

Standard (Improved Pattern)



FIG. 3294

Positive Drive

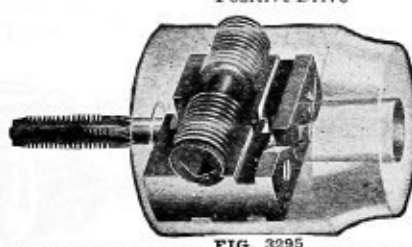


FIG. 3295

Standard Chucks have no projecting jaws and the plate prevents larger work than the chuck is designed for being used. They are very powerful and guaranteed to hold true and not injure the shank of the drills. The jaws are guided by three strong gibs.

The patented improvement in the Positive Drive Chuck consists in a set of adjustable positive drive jaws for holding taps, drills and other tools. The positive driving section of these jaws adjusts with the friction or centering jaws, so that the fastening of the tool is done in one operation.

Style.....	Standard (Improved)					Positive Drive			
Number.....	41	42	43	44	45	50	51	52	53
Capacity.....inches	0 to 1/4	0 to 3/8	0 to 1/2	0 to 3/4	0 to 1	0 to 3/8	0 to 1/2	0 to 3/4	0 to 1
Diameter....."	1 3/8	1 5/8	2 1/8	2 3/8	3 1/8	1 5/8	2 1/8	2 3/8	3 1/8
Length....."	2 3/8	2 1/2	2 5/8	3 3/8	4 1/4	2 1/4	2 3/8	3	3 3/4
Price.....each	\$6.00	6.50	7.00	8.00	10.00	8.00	9.00	10.00	12.00

JACOBS IMPROVED DRILL CHUCK



FIG. 3296

No.	Capacity, Inches	Diameter, Inches	Length, Inches	Length Jaws Extended, Inches	Price Each
1	0 to $\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{2}$	$1\frac{1}{8}$	\$5.50
1A	0 to $\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{4}$	5.50
2	0 to $\frac{3}{8}$	$1\frac{1}{2}$	$2\frac{1}{8}$	$2\frac{1}{4}$	5.50
2A	0 to $\frac{1}{2}$	$1\frac{1}{2}$	2	$2\frac{1}{8}$	5.50
3	0 to $\frac{5}{8}$	$2\frac{1}{8}$	3	$3\frac{1}{8}$	9.00
3A	0 to $\frac{7}{8}$	$2\frac{1}{8}$	$2\frac{1}{2}$	$3\frac{1}{8}$	9.00
4	$\frac{1}{4}$ to $\frac{3}{4}$	$2\frac{7}{8}$	$3\frac{1}{2}$	$4\frac{1}{2}$	18.00
5	$\frac{3}{8}$ to 1	$3\frac{3}{8}$	4	$5\frac{1}{8}$	25.00
6	0 to $\frac{1}{2}$	$1\frac{7}{8}$	$2\frac{1}{2}$	$3\frac{1}{8}$	9.00
6A	0 to $\frac{1}{2}$	$1\frac{7}{8}$	$2\frac{1}{2}$	$3\frac{3}{8}$	9.00

Jacobs Improved Chucks are a combination of sleeve and key chuck. These chucks are furnished in sizes 1A, 2A, 3A, and 6A, with flat back.

WESTCOTT'S NEW LITTLE GIANT
DOUBLE GRIP DRILL CHUCKS

FIG. 3297

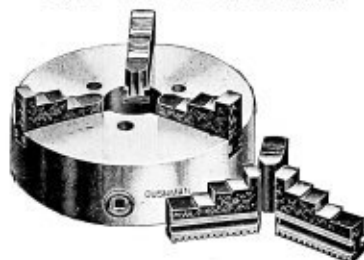
Number	Approximate Diameter	Holding Drills	Price	Unfinished Face Plate
0	$2\frac{1}{2}$ in.	0 to $\frac{1}{2}$ in.	\$ 9.00	.....
1	3 in.	0 to $\frac{3}{4}$ in.	10.00	.....
2	$3\frac{1}{2}$ in.	0 to 1 in.	11.00	.....
$2\frac{1}{2}$	4 in.	0 to 1 in. extra strong	12.00	.....
3	6 in.	0 to $1\frac{1}{2}$ in.	20.00	\$1.25
4	$6\frac{1}{2}$ in.	0 to 2 in.	25.00	1.25

"CUSHMAN" UNIVERSAL GEARED SCROLL CHUCKS

No. 31—3 Jaw

**FIG. 3298**

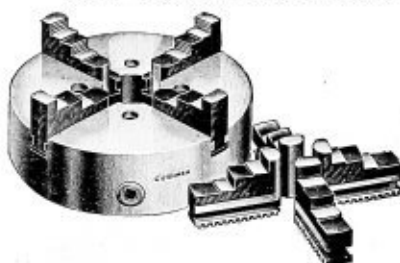
No. 34—3 Jaw (2 Sets of Jaws)

**FIG. 3299**

No. 41—4 Jaw

**FIG. 3300**

No. 44—4 Jaws (2 Sets of Jaws)

**FIG. 3301****Style 31. 3 Jaw Chuck, Jaws No. 1 Style**

- " 32. 3 " " " No. 2 "
 " 34. 3 " " { Has two sets of jaws,
 " 41. 4 " " { (One set each, No. 1 and No. 2.) }
 " 42. 4 " " Jaws No. 1 Style
 " 44. 4 " " " No. 2 Style
 " " " " { Has two sets of jaws,
 " " " " { (One set each, No. 1 and No. 2.) }

This style of chuck is the one most commonly used for holding round pieces. It is strictly a universal chuck, the jaws being removed simultaneously by the scroll threaded plate.

APPROXIMATE DIMENSIONS

Nominal Size, Inches	Diam. of Hole, Inches	Diameter of Recess for Flange, Inches	Approx. Weights	From Bottom of Recess to Face of Body, Inches	List Prices, Each			
					No. 31	No. 34	No. 41	No. 44
3	$\frac{5}{8}$	$2\frac{7}{8}$	$2\frac{1}{2}$	$1\frac{1}{2}$	\$17.00	\$20.00	\$19.00	\$22.00
4	1	$3\frac{1}{16}$	$6\frac{1}{2}$	2	19.00	22.00	21.00	24.00
5	$1\frac{1}{4}$	$3\frac{3}{4}$	$9\frac{3}{4}$	$2\frac{1}{4}$	21.00	24.00	23.00	27.00
6	$1\frac{3}{8}$	$4\frac{3}{4}$	15	$2\frac{1}{4}$	24.00	28.00	27.00	31.00
$7\frac{1}{2}$	2	$4\frac{3}{4}$	26	$2\frac{1}{2}$	27.00	32.00	30.00	36.00
9	$2\frac{1}{2}$	$5\frac{5}{8}$	36	$2\frac{3}{8}$	33.00	38.00	36.00	42.00
$10\frac{1}{2}$	3	$5\frac{5}{8}$	48	$2\frac{3}{4}$	38.00	44.00	42.00	49.00
12	3	7	71	$2\frac{1}{2}$	45.00	52.00	50.00	58.00
15	$3\frac{1}{4}$	7	119	$2\frac{1}{4}$	60.00	70.00	65.00	76.00
18	$3\frac{3}{4}$	$9\frac{1}{2}$	141	$2\frac{3}{8}$	80.00	92.00	87.00	102.00
21	$3\frac{3}{4}$	$9\frac{1}{2}$	194	$2\frac{3}{8}$	105.00	120.00	115.00	135.00

Diameter of body is same as the nominal size except the $7\frac{1}{2}$ inch size will run from $7\frac{1}{2}$ to 8 inches in diameter.

SKINNER UNIVERSAL GEARED SCROLL CHUCKS

Common Jaws No. 1



FIG. 3302

Reversed Jaws No. 2



FIG. 3303

With Two Sets of Jaws



FIG. 3304

These chucks are designed for manufacturing purposes and for hard service generally, but they can be used also on high-speed machines, as they are perfectly balanced. It is strictly a universal chuck, the jaws being moved simultaneously by the scroll-threaded plate.

The scroll thread and the curved teeth on jaws are made by special machinery, which not only insures their properly fitting in any position they may be placed, but the wear is reduced to a minimum. The scroll plate and pinion gears of all sizes are made of open-hearth steel. The jaws in the smaller sizes are made of a special crucible steel and the larger jaws are of open-hearth steel carefully case hardened.

Size Inches	Diameter of Hole Inches	Recess for Flange Inches	Weight Pounds, One Set Jaws	PRICE EACH			
				With One Set Jaws		With Two Sets Jaws	
				3-Jaw	4-Jaw	3-Jaw	4-Jaw
3	$\frac{5}{8}$	$2\frac{1}{4}$	$2\frac{1}{2}$	17.00	\$ 19.00	20.00	\$ 22.00
4	1	$3\frac{1}{16}$	$6\frac{1}{2}$	19.00	21.00	22.00	24.00
5	$1\frac{1}{4}$	$3\frac{3}{4}$	$9\frac{3}{4}$	21.00	23.00	24.00	27.00
6	$1\frac{1}{2}$	$4\frac{1}{4}$	15	24.00	27.00	28.00	31.00
$7\frac{1}{2}$	2	$4\frac{3}{4}$	26	27.00	30.00	32.00	36.00
9	$2\frac{1}{2}$	$5\frac{1}{4}$	36	33.00	36.00	38.00	42.00
$10\frac{1}{2}$	3	$5\frac{5}{8}$	48	38.00	42.00	44.00	49.00
12	3	7	71	45.00	50.00	52.00	58.00

SKINNER LATHE CHUCKS

WITH REVERSIBLE "J" JAWS

Universal

Combination

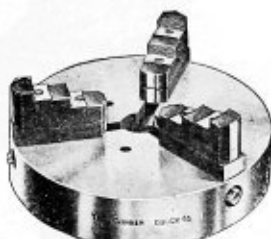


FIG. 3305

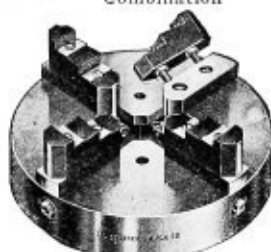


FIG. 3306

UNIVERSAL CHUCKS

Three-Jaw

Rated Size, Inches	Will Hold Approx., Inches	Order By These Numbers	Price
3	3 $\frac{3}{4}$	303J	\$24.00
4	4 $\frac{1}{2}$	304J	27.00
5	5 $\frac{3}{4}$	305J	30.00
6	7 $\frac{1}{4}$	306J	32.00
8	8 $\frac{5}{8}$	308J	38.00
9	9 $\frac{1}{2}$	309J	41.00
12	12 $\frac{7}{8}$	312J	49.00
15	16 $\frac{3}{8}$	315J	60.00
18	18 $\frac{3}{8}$	318J	75.00
21	21 $\frac{1}{4}$	321J	96.00
24	25	324J	120.00
27	28 $\frac{1}{2}$	327J	145.00
30	31 $\frac{3}{4}$	330J	180.00
36	37	336J	235.00
42	42 $\frac{1}{4}$	342J	300.00

A Universal Lathe Chuck is one in which the jaws are all operated at once, moving to and from the center together and having a common center at all times.

COMBINATION CHUCKS

Three-Jaw

Four-Jaw

Rated Size, Inches	Will Hold Approx., Inches	Order By These Numbers	Price	Order By These Numbers	Price
3	3 $\frac{3}{4}$	603J	\$26.00		
4	4 $\frac{1}{2}$	604J	29.00	804J	\$36.00
5	5 $\frac{3}{4}$	605J	32.00	805J	39.00
6	7 $\frac{1}{4}$	606J	35.00	806J	42.00
8	8 $\frac{5}{8}$	608J	42.00	808J	50.00
9	9 $\frac{1}{2}$	609J	45.00	809J	54.00
12	12 $\frac{7}{8}$	612J	56.00	812J	66.00
15	16 $\frac{3}{8}$	615J	70.00	815J	82.00
18	18 $\frac{3}{8}$	618J	87.00	818J	102.00
21	21 $\frac{1}{4}$	621J	110.00	821J	130.00
24	25	624J	136.00	824J	160.00
27	28 $\frac{1}{2}$	627J	160.00	827J	192.00
30	31 $\frac{3}{4}$	630J	200.00	830J	240.00
36	37	636J	264.00	836J	325.00
42	42 $\frac{1}{4}$	642J	360.00	842J	450.00

A Combination Chuck is a combination of a universal and an independent chuck. The jaws may be operated universally or independently as desired.

"CUSHMAN" INDEPENDENT FOUR JAW CHUCK
SOLID REVERSIBLE JAWS
HEAVY PATTERN NO. 12



FIG. 3307

Nominal Size	Hole in Body, Inches	Diameter of Recess for Flange, Inches	Weight, Lbs.	From Bottom of Recess to Face of Body, Inches	No. 12 Iron Body, List Price, Each	No. 212 Steel Body, List Price, Each
4½	1	4½	8	2	\$20.00	.....
6	1½	5½	14	2	22.00	.....
8	1¾	4¾	30	2½	26.00	\$42.00
9	1¾	4¾	35	2½	28.00	.....
10	2	5½	42	2¾	30.00	50.00
12	2¾	6½	70	2¾	35.00	58.00
14	3	6½	90	2¾	40.00	67.00
15	3	7½	105	2¾	43.00	.....
16	3	7½	120	2¾	46.00	76.00
18	4	9½	160	3½	54.00	87.00
20	4	9½	200	3½	62.00	100.00
22	5	11	240	3¾	70.00	114.00
24	5	11	285	3¾	80.00	130.00
26	5	12	310	3¾	93.00	150.00
28	5	13	355	3¾	110.00	175.00
30	5	15	440	3¾	130.00	200.00
32	5	15	525	3¾	155.00	.....
34	6	17¾	575	3¾	180.00	.....
36	6	17¾	600	3¾	210.00	.....

The capacity of these chucks is as great as any chuck made of this type, and they will hold pieces from 1 to 4 inches larger than their rated diameter; but when a chuck jaw is extended to hold larger than the diameter of chuck body, many of the jaw teeth have then become disengaged with the screw threads, and the wider the chuck is opened the fewer jaw teeth and screw threads are left to withstand all the strain from holding the extra large work. The safe capacity of this type of chuck is but little beyond its nominal size.

For lathes and machines requiring something larger than the 36-inch, we have a line of Face-Plate Jaws which answer every purpose.

A powerful steel wrench for operating the jaws is furnished with each chuck.

SKINNER INDEPENDENT LATHE CHUCKS

No. 900—Solid Reversible Jaws
Iron Body

FIG. 3308

No. 1900—Heavy Pattern with
Reversible Jaws, All Steel

FIG. 3309

Order by these Numbers	Rated Size of Chuck Inches	Will Hold About Inches	Approximate Shipping Weight Lbs.	List Price
904	4½	6	10	\$20.00
906	6	7½	17	22.00
907	7½	8¾	23	25.00
908	8	9½	34	26.00
909	9	11½	42	28.00
910	10	12½	49	30.00
912	12	14½	80	35.00
914	14	16½	105	40.00
915	15	18	122	43.00
916	16	19	133	46.00
918	18	21	175	54.00
920	20	23	195	62.00
922	22	25	226	70.00
924	24	27	270	80.00
926	26	29	315	93.00
928	28	31	340	110.00
930	30	35	485	130.00
932	32	36	540	155.00
934	34	38	560	180.00
936	36	41	715	210.00
938	38	43	1089	245.00
940	40	45	1175	280.00
942	42	47	1203	320.00
944	44	49	1250	360.00
946	46	52	1500	420.00
948	48	54	1600	500.00

With Hardened Steel Bearings for Jaw
Adjusting Screws.

Four Solid Reversible Jaws of Hardened Steel with raised and ground steps.

This is the strongest Independent Chuck made.

Order by these Numbers	Rated Size of Chuck Inches	Will Hold About Inches	Approximate Shipping Weight Lbs.	List Price
1908	8	9½	34	\$42.00
1909	9	11½	43	46.00
1910	10	12½	53	50.00
1912	12	14½	86	58.00
1914	14	16½	113	67.00
1915	15	18	134	71.00
1916	16	19	145	76.00
1918	18	21	191	87.00
1920	20	23	214	100.00
1922	22	25	242	114.00
1924	24	27	308	130.00
1926	26	29	358	150.00
1928	28	31	367	175.00
1930	30	35	559	200.00
1932	32	37	625	240.00
1934	34	39	690	300.00
1936	36	41	711	345.00
1942	42	44	1200	500.00

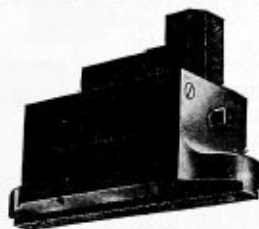


FIG. 3310

REVERSIBLE FACE-PLATE JAW

*Size, Inches	Approximate Net Weight per Jaw, Pounds	Price, Per Set of Three	Price, Per Set of Four
6	15	\$39.00	\$52.00
8	40	48.00	64.00
10	60	60.00	80.00
12	70	84.00	112.00
14	100	108.00	144.00

*The size given is the same as the length of the jaw body not including lugs.

There is a rib 1¼ inches on the bottom of the jaws to be finished to fit the slots in the face-plate. The above prices are for the Iron Body Jaws. These Jaws can also be furnished with Steel Bodies. We can also furnish the Double Rib Boring Mill Jaws.

SKINNER PLANER CHUCKS

Round Swivel Base

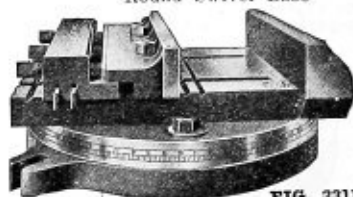


FIG. 3311

Square Base



FIG. 3312

Round Swivel Base Chuck						Square Base Chuck				
Size Chuck No.	Price	*Length of Jaw, Inches	*Depth of Jaw, Inches	*Jaws Will Open, In.	**Space Required, Inches	Approximate Shipping Weight, Lbs.	Size Chuck No.	Price	Space Required, Inches	Approximate Shipping Weight, Lbs.
6 R	\$32.00	7	1½	3½	10	77	6 S	\$22.00	7¼x11	55
8 R	38.00	9	1¾	5	11½	95	8 S	27.00	9 x12½	68
10 R	45.00	11	2¾	6	14	165	10 S	32.00	11 x15	110
12 R	54.00	13	2¾	8	16	220	12 S	38.00	13 x17	130
15 R	70.00	15½	2½	9½	20	310	15 S	50.00	15½x21	234
18 R	90.00	18½	2¾	11¼	22	442	18 S	64.00	18½x24	320
24 R	130.00	24¼	2¾	16	26	722	24 S	92.00	24¼x28	508
30 R	200.00	30¼	3	21½	32	1200	30 S	175.00	30¼x34	1055

*Round Swivel Base and Square Base same Dimensions.

**When necessary to use Chuck at angle 45 degrees, space required will be greater.

The Round Base Chucks have rib 1¼ inches wide cast on bottom which can be machined to fit slot in planer table, and also have two ears for bolting to table.

The Square Base Chucks have a flange on all sides for clamping to machine table.

CENTER ARBORS FOR DRILL CHUCKS



FIG. 3313

Plain Arbor with blank shank 4½ inches long and ¾ inch or 1 inch diameter.

Fitted to ¼, ⅜, ½ in. drill chucks. \$0.75

Fitted to ¾ inch drill chucks. 1.00

Fitted to 1 inch drill chucks. 1.25



FIG. 3314

Arbor with nut, blank shank 4½ inches long, and ¾ inch or 1 inch diameter.

Fitted to ¼, ⅜, ½ in. drill chucks. \$....

Fitted to ¾ and 1 in. drill chucks. \$....

Price on application.



FIG. 3315

Taper Arbors fitted to any size chucks.

Morse Taper Shanks No. 1. \$1.00

Morse Taper Shanks No. 2. 1.00

Morse Taper Shanks No. 3. 1.25

Morse Taper Shanks No. 4. 2.00

Morse Taper Shanks No. 5. 3.50



FIG. 3316

Arbor for Blacksmith Drill Presses, with ½ in., ¾ in. shank.

Fitted to ¼ in., ⅜ in., ½ in. chuck. \$0.50

Fitted to ¾ in. chuck.80

Fitted to 1 in. chuck. 1.25

STANDARD LATHE WORKING SETS

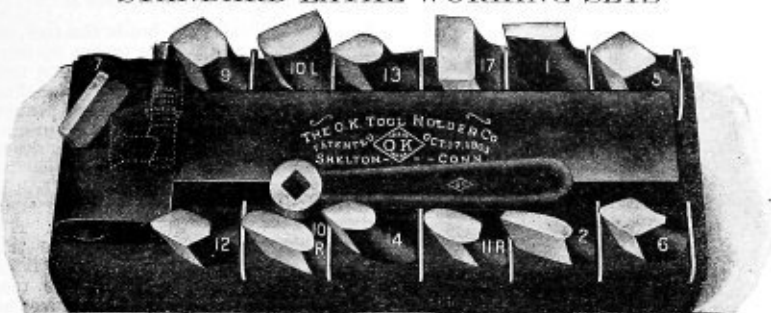


FIG. 3317

Working Sets in sizes from A to C consist of a holder, block and thirteen assorted tools; from D to H consist of a holder, block and twelve assorted tools. High Speed Steel.

Size A	$\frac{3}{8} \times \frac{3}{4}$ in.	Tools. Nos. 5, 6, 1, 2, 17, 9, 13, 14, 8, 12, 12, 7, 2.....	\$ 5.85
Size B	$\frac{1}{2} \times 1$ in.	Tools. Nos. 5, 6, 1, 2, 17, 11R, 13, 14, 8, 9, 12, 7, 2.....	6.50
Size C	$\frac{3}{8} \times 1\frac{1}{2}$ in.	Tools. Nos. 12, 9, 2, 1, 14, 13, 10R, 10L, 11R, 17, 5, 6, 7.....	8.00
Size D	$\frac{3}{8} \times 1\frac{1}{4}$ in.	Tools. Nos. 1, 2, 5, 6, 9, 10L, 10R, 11R, 11L, 17, 12, 13.....	13.00
Size E	$1 \times 1\frac{3}{4}$ in.	Tools. Nos. 1, 2, 5, 6, 9, 10R, 10L, 11R, 11L, 17, 12, 12.....	17.15
Size F	$1\frac{1}{4} \times 2$ in.	Tools. Nos. 11R, 11R, 11L, 5A, 6A, 10R, 10L, 12, 9, 5, 6, 17.....	22.25
Size G	$1\frac{1}{2} \times 2$ in.	Tools. Nos. 11R, 11R, 11L, 12, 9, 5, 6, 11R, 11L, 17, 11R, 11L.....	29.25
Size H	$1\frac{3}{4} \times 2\frac{1}{2}$ in.	Tools. Nos. 11R, 11R, 11L, 11L, 11L, 11L, 12, 9, 5, 6, 17, 11R.....	37.25

Working sets for shaper use same as above, except tools are ground with same clearance as planer tools, and tools Nos. 20 and 11L substituted for tools Nos. 13 and 14. Be sure and specify for shaper use when ordering.

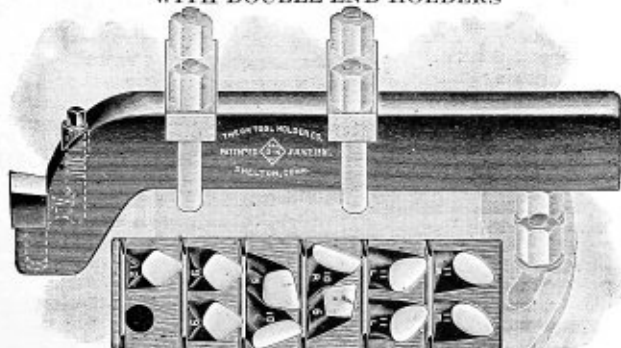
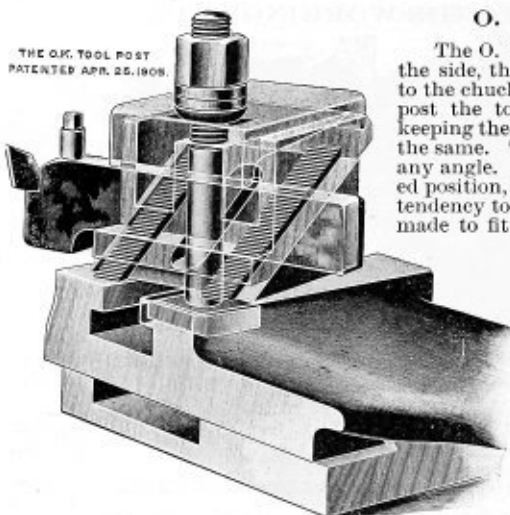
STANDARD PLANER SETS
WITH DOUBLE END HOLDERS

FIG. 3318

Size C	$\frac{3}{4} \times 1\frac{1}{2} \times 12$ in.	12 Tools. Nos. 11R, 11L, 20, 10R, 10L, 6, 5, 9, 17, 12, 1, 2.....	\$11.00
Size D	$1 \times 1\frac{1}{2} \times 15$ in.	12 Tools. Nos. as above.....	17.25
Size E	$1\frac{1}{4} \times 2 \times 18$ in.	12 Tools. Nos. 11R, 11L, 20, 10R, 10L, 6A, 5A, 9, 17, 1, 2.....	21.15
Size F	$1\frac{1}{2} \times 2\frac{1}{2} \times 24$ in.	12 Tools. Nos. 11R, 11L, 10R, 10L, 9, 12, 5, 6, 17, 22R and L, 22 str. 11L.....	27.75
Size G	$1\frac{3}{4} \times 3 \times 24$ in.	12 Tools. Nos. as above in Size F.....	36.75
Size H	$2 \times 3\frac{1}{2} \times 24$ in.	12 Tools. Nos. as above in Size H.....	45.75



THE O.K. TOOL POST
PATENTED APR. 25, 1908

O. K. TOOL POST

The O. K. Tool Post holds the tool on the side, thus enabling one to get up near to the chuck or face plate. With this tool post the tool is adjusted vertically, thus keeping the clearance on cutting tool always the same. The tool post swings around at any angle. After once placing in the desired position, the process of tightening has no tendency to twist the tool post. The bolt is made to fit the T. slot so that there is no danger of *injuring same*. The nut is made to fit the tail stock wrench. When it is necessary to grind the tool and it is desired to remove the tool or holder, the vertical adjustment is not affected. By swinging the tool post around at right angles and using a small V block, it makes the strongest kind of a boring tool holder. All parts are steel drop forgings, carefully machined all over, case-hardened and interchangeable.

FIG. 3319

Tool Post No. 1 suitable for 14" to 18" lathes.....	each	\$10.00
" " " 2 " " 20" to 28" lathes.....	"	20.00
" " " 3 " " 30" to 40" lathes.....	"	40.00

Tool Post No. 1 adapted for holders from $1\frac{1}{8}$ inches to $1\frac{1}{2}$ inches high and any width.

Tool Post No. 2 adapted for holders from $1\frac{1}{4}$ to $1\frac{3}{4}$ inches high and any width.

Tool Post No. 3 adapted for holders from 2 inches to $2\frac{1}{2}$ inches high and any width.

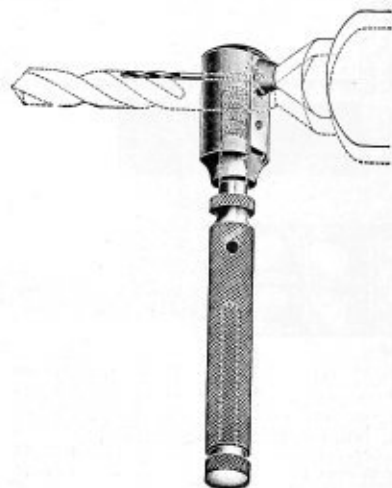


FIG. 3320

O. K. DRILL HOLDERS

SIZE A HOLDER TAKES A DRILL
FROM NO. 60 TO 5-16 INCH

List price of Size A Holder.....\$1.50

This Holder locates the back floating center exactly in line with the point of drill, reamer or tap.

BULLDOG TOOL HOLDERS

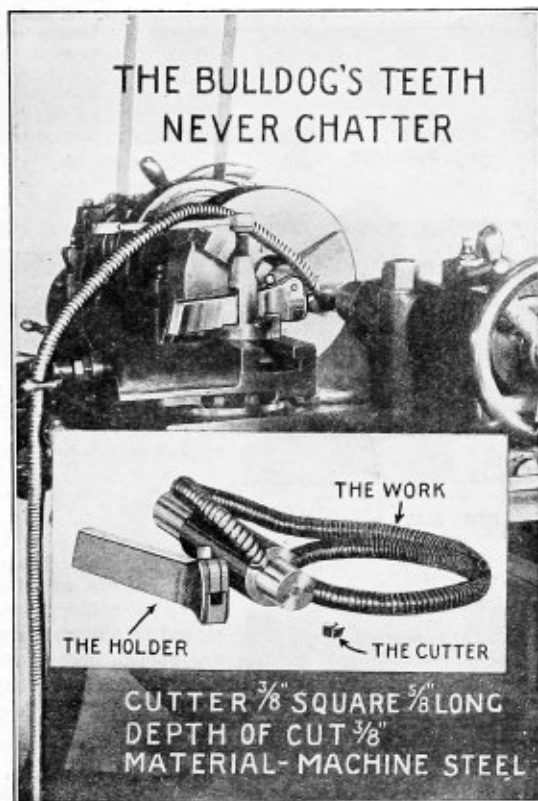


FIG. 3321

Above cut shows Bull Dog Holder at work with a cutter $\frac{3}{8}$ inch square and $\frac{5}{8}$ inch long. Note the undershot Jaw.

The Bull Dog enables you to use up short cutter ends which usually are wasted. Welding short ends to forged shanks is no longer necessary. The Bull Dog cannot break cutters even if badly warped.

The Bull Dog Never Lets Go.

See cuts and lists on following page.

BULL DOG TOOL HOLDERS—CONTINUED



FIG. 3322

When using a full length cutter, the Bull Dog is, on account of the double grip, as rigid and fully as efficient as a solid high-speed forged tool.

When using a short cutter, the Bull Dog is more rigid and more efficient than any other type of holder using a full length cutter.



FIG. 3323

Right Hand

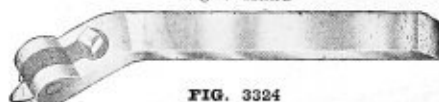


FIG. 3324

Straight



FIG. 3325

No cutters are furnished with Bull Dog holders, for, as it is designed to use standard sizes, there are enough short ends around the average machine shop to furnish cutters for months to come.

Left Hand

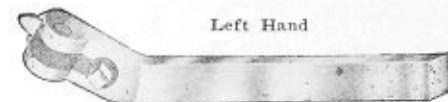


FIG. 3326

Price List, Complete with Wrench.

Left Hand No.	Straight Shank No.	Right Hand No.	Size of Holder, Inches	Size of Cutter, Inches Square	Price Each Complete
1-L	1-S	1-R	$\frac{1}{2} \times 1 \frac{1}{4} \times 6$	$\frac{3}{16}$	\$3.00
2-L	2-S	2-R	$\frac{5}{8} \times 1 \frac{3}{8} \times 7$	$\frac{3}{8}$	3.50
3-L	3-S	3-R	$\frac{3}{4} \times 1 \frac{5}{8} \times 8$	$\frac{7}{16}$	4.50
4-L	4-S	4-R	$\frac{7}{8} \times 1 \frac{3}{4} \times 9$	$\frac{1}{2}$	5.50
5-L	5-S	5-R	1 x 2 x 11	$\frac{5}{8}$	6.80

Other sizes in process of manufacture.

"AGRIPPA" TURNING TOOL HOLDERS

Offset Shank



FIG. 3327

Straight Shank



FIG. 3328

WITH RIGHT HAND AND LEFT HAND OFFSET AND STRAIGHT SHANKS

Furnished with either Hexagon Head or Headless Cam, Hardened Wrench and one Cutter.

Both types of cams are interchangeable, and extra Cams can be furnished at a slight extra charge.

The "diamond point" form in which Cutters are furnished requires the minimum of grinding for either right or left hand usage.

Unless otherwise specified, Hexagon Head Cam will be furnished.

Number Left Hand	Number Right Hand	Holder, Size	Cutter Size Sq.	PRICE		
				Inter- changeable Cams, Extra	Cutter Only	Complete Tool
					High Speed	With High Speed Cutter
OFFSET SHANKS						
00-L	00-R	$\frac{1}{8} \times \frac{3}{4} \times 4\frac{3}{4}$	$\frac{1}{8}$	\$0.60	\$0.15	\$1.70
0-L	0-R	$\frac{3}{8} \times \frac{7}{8} \times 5\frac{1}{2}$	$\frac{1}{4}$	.66	.22	1.80
1-L	1-R	$\frac{1}{2} \times 1\frac{1}{8} \times 6\frac{3}{4}$	$\frac{3}{16}$	.73	.35	2.05
2-L	2-R	$\frac{5}{8} \times 1\frac{3}{8} \times 8$	$\frac{3}{8}$	.81	.60	2.65
3-L	3-R	$\frac{3}{4} \times 1\frac{5}{8} \times 9\frac{1}{4}$	$\frac{7}{8}$	.90	.90	3.50
4-L	4-R	$\frac{7}{8} \times 1\frac{3}{4} \times 10\frac{1}{4}$	$1\frac{1}{2}$	1.00	1.30	4.45
5-L	5-R	1 x2 x12 $\frac{1}{2}$	$\frac{5}{8}$	1.10	2.35	5.70
6-L	6-R	1 $\frac{1}{4}$ x2 $\frac{1}{4}$ x14 $\frac{1}{4}$	$\frac{3}{4}$	1.20	3.85	8.50

Number Left Hand	Holder, Size	Cutter Size Sq.	PRICE		
			Inter- changeable Cams, Extra	Cutter Only	Complete Tool
				High Speed	With High Speed Cutter
STRAIGHT SHANKS					
00-S	$\frac{1}{8} \times \frac{3}{4} \times 4\frac{1}{2}$	$\frac{1}{8}$	\$0.60	\$0.15	\$1.70
0-S	$\frac{3}{8} \times \frac{7}{8} \times 5$	$\frac{1}{4}$	.66	.22	1.80
1-S	$\frac{1}{2} \times 1\frac{1}{8} \times 6$	$\frac{3}{16}$	.73	.35	2.05
2-S	$\frac{5}{8} \times 1\frac{3}{8} \times 7$	$\frac{3}{8}$	.81	.60	2.65
3-S	$\frac{3}{4} \times 1\frac{5}{8} \times 8$	$\frac{7}{8}$	.90	.90	3.50
4-S	$\frac{7}{8} \times 1\frac{3}{4} \times 9$	$\frac{1}{2}$	1.00	1.30	4.45
5-S	1 x2 x11	$\frac{5}{8}$	1.10	2.35	5.70
6-S	$1\frac{1}{4} \times 2\frac{1}{4} \times 14\frac{1}{4}$	$\frac{3}{4}$	1.20	3.85	8.50

"AGRIPPA" DROP-HEAD TURNING-TOOL HOLDERS

Designed for use on Lathes with Clamp-tool Rests and low centers, and excellently adapted for Shaper and Planer work.

With Offset Shank



FIG. 3329

With Straight Shank



FIG. 3330

WITH RIGHT AND LEFT HAND OFFSET AND STRAIGHT SHANKS

Furnished with either Hexagon Head or Headless Cam, Hardened Wrench and one Cutter.

Both types of Cams are interchangeable, and extra Cams can be furnished at a slight extra charge.

The "diamond point" form in which Cutters are furnished requires the minimum of grinding for either right or left hand usage.

Unless otherwise specified, Hexagon Head Cam will be furnished.

Number	Number	Holder, Size	Cutter Size Square	Height from Bottom of Shank to Cutter Point	PRICE		
					Inter- changeable Cams, Extra	Cutters Only	Comp. Tool
Left Hand	Right Hand				High Speed	With High-Speed Cutter	
OFFSET SHANK							
0200-L	0200-R	$\frac{7}{8} \times \frac{7}{8} \times 6$	$\frac{7}{8}$	$\frac{1}{8}$	\$0.60	\$0.15	\$1.80
200-L	200-R	$\frac{7}{8} \times \frac{1}{2} \times 7$	$\frac{1}{4}$	$\frac{1}{8}$	.66	.22	2.15
201-L	201-R	$\frac{3}{4} \times \frac{7}{8} \times 8$	$\frac{3}{8}$	$\frac{1}{8}$	.73	.35	2.75
202-L	202-R	$\frac{7}{8} \times 1 \times 9$	$\frac{7}{8}$	$\frac{1}{8}$	.81	.60	3.60
204-L	204-R	$1\frac{1}{8} \times 1\frac{1}{4} \times 11$	$\frac{1}{2}$	$1\frac{1}{8}$	1.00	1.30	5.65
STRAIGHT SHANK							
0200-S		$\frac{7}{8} \times \frac{7}{8} \times 6$	$\frac{7}{8}$	$\frac{1}{8}$	\$0.60	\$0.15	\$1.80
200-S		$\frac{7}{8} \times \frac{1}{2} \times 7$	$\frac{1}{4}$	$\frac{1}{8}$	.66	.22	2.15
201-S		$\frac{3}{4} \times \frac{7}{8} \times 8$	$\frac{3}{8}$	$\frac{1}{8}$	.73	.35	2.75
202-S		$\frac{7}{8} \times 1 \times 9$	$\frac{7}{8}$	$\frac{1}{8}$	.81	.60	3.60
204-S		$1\frac{1}{8} \times 1\frac{1}{4} \times 11$	$\frac{1}{2}$	$1\frac{1}{8}$	1.00	1.30	5.65

"AGRIPPA" CUTTING-OFF AND SIDE TOOL HOLDERS**FOR INTERCHANGEABLE BLADES****FIG. 3331****FIG. 3332****RIGHT AND LEFT HAND OFFSET AND RIGHT HAND STRAIGHT SHANKS**

Furnished with either Cam, Hardened Wrench and Blade.

Both types of Cam are interchangeable, and extra Cams can be furnished at a slight extra charge.

The Cutter Blades are furnished from High Speed Steel and ground ready for use.

Unless otherwise specified, a High-Speed Steel Cutting-off Blade and Hex Head Cam will be furnished with the Holder.

Number	Number	Holder, Size	Cutter Blade, Finished Size		PRICE			
			Cutting off Tool	Side Tool	Extra Cutting- off Tool Blade	Extra Side- Tool Blade	Complete Holder	
							With Cutting- off Tool Blade	With Side Tool Blade
Left Hand	Right Hand				High Speed	High Speed	High Speed	High Speed
OFFSET SHANK								
030-L	030-R	$\frac{5}{8} \times \frac{3}{4} \times 4\frac{1}{2}$	$\frac{5}{8} \times 1\frac{1}{2}$	$\frac{1}{2} \times 1\frac{1}{2}$	\$0.60	\$0.60	\$1.90	\$1.90
30-L	30-R	$\frac{3}{8} \times \frac{5}{8} \times 5\frac{1}{2}$	$\frac{3}{8} \times 5\frac{1}{2}$	$\frac{3}{8} \times 5\frac{1}{2}$	.60	.85	1.90	2.15
31-L	31-R	$\frac{1}{2} \times 1\frac{1}{2} \times 6\frac{1}{4}$	$\frac{1}{2} \times 3\frac{3}{4}$	$\frac{3}{8} \times 3\frac{3}{4}$	.85	1.40	2.15	2.70
32-L	32-R	$\frac{5}{8} \times 1\frac{3}{8} \times 7\frac{1}{4}$	$\frac{1}{2} \times 3\frac{3}{8}$	$\frac{1}{4} \times 3\frac{3}{8}$	1.30	2.30	2.75	3.75
33-L	33-R	$\frac{3}{4} \times 1\frac{3}{8} \times 8\frac{1}{2}$	$\frac{3}{8} \times 1$	$\frac{3}{8} \times 1$	2.15	3.55	3.60	5.00
*34-L	*34-R	$\frac{7}{8} \times 1\frac{3}{4} \times 9\frac{1}{2}$	$\frac{3}{8} \times 1\frac{1}{2}$	$\frac{3}{8} \times 1\frac{1}{2}$	2.75	4.50	4.50	6.25
RIGHT HAND STRAIGHT SHANKS								
020-R	.....	$\frac{5}{8} \times \frac{3}{4} \times 4\frac{1}{2}$	$\frac{5}{8} \times 1\frac{1}{2}$	$\frac{1}{2} \times 1\frac{1}{2}$	\$0.60	\$0.60	\$1.90	\$1.90
20-R	.....	$\frac{3}{8} \times \frac{5}{8} \times 5\frac{1}{2}$	$\frac{3}{8} \times 5\frac{1}{2}$	$\frac{3}{8} \times 5\frac{1}{2}$	.60	.85	1.90	2.15
21-R	.....	$\frac{1}{2} \times 1\frac{1}{2} \times 6\frac{1}{4}$	$\frac{1}{2} \times 3\frac{3}{4}$	$\frac{3}{8} \times 3\frac{3}{4}$	.85	1.40	2.15	2.70
22-R	.....	$\frac{5}{8} \times 1\frac{3}{8} \times 7\frac{1}{4}$	$\frac{1}{2} \times 3\frac{3}{8}$	$\frac{1}{4} \times 3\frac{3}{8}$	1.30	2.30	2.75	3.75
23-R	.....	$\frac{3}{4} \times 1\frac{3}{8} \times 8\frac{1}{2}$	$\frac{3}{8} \times 1$	$\frac{3}{8} \times 1$	2.15	3.55	3.60	5.00
*24-R	.....	$\frac{7}{8} \times 1\frac{3}{4} \times 9\frac{1}{2}$	$\frac{3}{8} \times 1\frac{1}{2}$	$\frac{3}{8} \times 1\frac{1}{2}$	2.75	4.50	4.50	6.25

*Extra heavy cutting-off blades, $\frac{1}{4} \times 1\frac{1}{8}$ ", fitting 34-R, 34-L and 24-R can be furnished. List price \$4.00 each.

"AGRIPPA" BORING-TOOL HOLDERS FOR MULTIPLE BARS



FIG. 3333

Furnished with either Plain or Sleeve Bar, 1 each 45° and 90° Cutter and two Hardened Wrenches.

Unless otherwise specified, standard size Sleeve-bar will be furnished.

Number	Holder, Size	Holder, Capacity for Bars, Size	Standard Bar Size	PRICE		Number
				Complete Holder		
				With Plain Bar	With Sleeve Bar	
				High Speed Cutters	High Speed Cutters	
080	$\frac{5}{8}$ X $\frac{3}{4}$	$\frac{3}{8}$ to $\frac{1}{2}$	$\frac{1}{2}$	\$2.90	\$3.25	080
80	$\frac{5}{8}$ X $\frac{7}{8}$	$\frac{1}{4}$ to $\frac{5}{8}$	$\frac{5}{8}$	3.05	3.45	80
81	$\frac{1}{2}$ X $1\frac{1}{8}$	$\frac{1}{4}$ to $\frac{3}{4}$	$\frac{3}{4}$	3.65	4.10	81
82	$\frac{5}{8}$ X $1\frac{3}{8}$	$\frac{3}{8}$ to $\frac{5}{8}$	$\frac{5}{8}$	4.70	5.40	82
83	$\frac{3}{4}$ X $1\frac{5}{8}$	$\frac{1}{2}$ to $1\frac{1}{8}$	$1\frac{1}{8}$	6.75	7.60	83

BORING BARS AND CUTTERS FOR "AGRIPPA" BORING TOOL HOLDERS

"Agrippa" Boring Bars Approximate Size		For Use With Holder No.	Cutters		PRICE		
			Size	For Use at Angles of	Cutters Only	Complete Bar	
Plain	Sleeve				High Speed	Plain High Speed Cutters	Sleeve High Speed Cutters
$\frac{1}{2}$ x $8\frac{1}{8}$	$\frac{1}{2}$ x $7\frac{7}{8}$	080-83	$\frac{3}{8}$ x 1	90°	\$0.10		
			$\frac{3}{8}$ x $1\frac{1}{2}$	45°	.12	\$1.30	\$1.65
$\frac{5}{8}$ x $10\frac{1}{8}$	$\frac{5}{8}$ x $9\frac{1}{8}$	80-83	$\frac{3}{8}$ x 1	90°	.10		
			$\frac{3}{8}$ x $1\frac{1}{2}$	45°	.12	1.40	1.80
$\frac{3}{4}$ x $12\frac{1}{8}$	$\frac{3}{4}$ x 11	81-83	$\frac{1}{4}$ x $1\frac{1}{4}$	90°	.15		
			$\frac{1}{4}$ x 2	45°	.19	1.80	2.25
$\frac{5}{8}$ x $14\frac{1}{8}$	$\frac{5}{8}$ x $13\frac{1}{4}$	82-83	$\frac{5}{16}$ x $1\frac{1}{2}$	90°	.24		
			$\frac{5}{16}$ x $2\frac{1}{2}$	45°	.32	2.60	3.30
$1\frac{1}{8}$ x $16\frac{1}{4}$	$1\frac{1}{8}$ x 16	83	$\frac{3}{8}$ x $1\frac{7}{8}$	90°	.35		
			$\frac{3}{8}$ x 3	45°	.55	3.75	4.60

"AGRIPPA" KNURLING-TOOL HOLDER WITH UNIVERSAL REVOLVING HEAD



FIG. 3334

Number	Holder, Size	Standard Knurls Size	PRICE		Number
			Knurls, Pair	Complete Holder	
11-K	$\frac{1}{2}$ x $1\frac{1}{8}$ x $6\frac{5}{8}$	$\frac{5}{16}$ x $\frac{3}{4}$	\$0.75	\$6.00	11-K

"AGRIPPA" THREADING-TOOL HOLDERS WITH LOCKABLE-SPRING HEAD



FIG. 3335

Furnished with Special Headless Cam Lock Nut, Alloy Steel Cutter and Hardened Wrench

A highly perfected tool for fine or coarse threading or other lathe work. The nut for Lockable-spring Head provides for the perfectly rigid backing required for coarse threading and heavy cuts, and when it is loosened the Holder becomes a spring-tool for finishing work. It is equally excellent used as a Turning-tool Holder, for which purpose the Self-hardening or High Speed Cutters furnished with the Turning-tool Holders can be supplied.

Number	Holder, Size	Cutter Size, Square	PRICE	
			Ground Cutter, Alloy Steel	Complete Tool
50	$\frac{3}{8}$ x $\frac{7}{8}$	$\frac{1}{4}$	\$0.45	\$2.25
51	$\frac{1}{2}$ x $1\frac{1}{8}$	$\frac{3}{16}$	.55	2.75
52	$\frac{3}{8}$ x $1\frac{1}{2}$	$\frac{3}{8}$	.70	3.50

"AGRIPPA" PLANING-TOOL HOLDERS



FIG. 3336

Furnished with one Cutter and Hardened Drop-forged Wrench.

A rugged, substantial tool of absolute efficiency and great dependability on either lathe or planer. Because of its numerous angles of adjustment it also makes an excellent Offset Turning Tool.

No.	Holder, Size	Cutter Size	PRICE		
			Adjustment Ring, Extra	Cutters Only High Speed	Complete Holder High Speed Cutters
91	$\frac{1}{2}$ x 1 x 7	$\frac{1}{4}$ x $\frac{3}{8}$	\$.40	\$.35	\$ 3.00
92	$\frac{5}{8}$ x $1\frac{1}{4}$ x $8\frac{1}{2}$	$\frac{5}{16}$ x $\frac{7}{8}$	.45	.55	3.90
93	$\frac{3}{4}$ x $1\frac{1}{2}$ x $10\frac{1}{4}$	$\frac{3}{8}$ x $1\frac{1}{2}$	.55	.80	5.10
94	1 x $1\frac{3}{4}$ x $13\frac{1}{4}$	$\frac{1}{2}$ x $1\frac{3}{4}$	.70	1.95	8.05
95	$1\frac{1}{8}$ x 2 x $16\frac{1}{2}$	$\frac{5}{8}$ x $1\frac{3}{4}$	1.00	3.35	12.50
96	$1\frac{3}{4}$ x $2\frac{3}{8}$ x 19	$\frac{3}{4}$ x 1	1.50	5.25	19.50
97	$2\frac{1}{8}$ x $2\frac{3}{4}$ x 22	$\frac{7}{8}$ x $1\frac{1}{8}$	2.25	8.20	29.70

ARMSTRONG TOOL HOLDERS STRAIGHT AND OFF-SET SHANK



FIG. 3337



FIG. 3338



FIG. 3339

Price List, Complete with Wrench and One High Speed Cutter.

Left Hand No.	Straight Shank No.	Right Hand No.	Size of Holder, Inches	Size of Cutters, Inches Square	Extra Cutters, Each	Price Each, Complete
00-L	00-S	00-R	$\frac{1}{8} \times \frac{3}{8} \times 4\frac{1}{2}$	$\frac{1}{8}$	\$0.25	\$1.80
0-L	0-S	0-R	$\frac{3}{8} \times \frac{7}{8} \times 5$	$\frac{1}{4}$	.30	1.90
1-L	1-S	1-R	$\frac{1}{2} \times 1\frac{1}{8} \times 6$	$\frac{1}{8}$	.45	2.15
2-L	2-S	2-R	$\frac{5}{8} \times 1\frac{1}{2} \times 7$	$\frac{3}{8}$	.65	2.70
3-L	3-S	3-R	$\frac{3}{4} \times 1\frac{3}{8} \times 8$	$\frac{1}{2}$	1.00	3.60
4-L	4-S	4-R	$\frac{7}{8} \times 1\frac{3}{4} \times 9$	$\frac{1}{2}$	1.45	4.60
5-L	5-S	5-R	1 x 2 x 11	$\frac{5}{8}$	2.50	5.85
6-L	6-S	6-R	1 $\frac{1}{4}$ x 2 $\frac{1}{4}$ x 13	$\frac{3}{4}$	4.10	8.75
7-L	7-S	7-R	1 $\frac{1}{2}$ x 2 $\frac{1}{2}$ x 16	$\frac{7}{8}$	6.00	15.00
750-L	750-S	750-R	1 $\frac{3}{8}$ x 2 $\frac{3}{4}$ x 18	1	8.60	22.00
800-L	800-S	800-R	1 $\frac{3}{4}$ x 3 x 20	1 $\frac{1}{8}$	11.90	28.50

ARMSTRONG DROP HEAD TOOL HOLDERS STRAIGHT AND OFF-SET SHANK

Right Hand Off-Set



FIG. 3340

Left Hand Off-Set



FIG. 3341

Straight Shank



FIG. 3342

Price List, Complete with Wrench and One High Speed Cutter.

Left Hand Off-Set No.	Straight Shank No.	Right Hand Off-Set No.	Size of Holder, Inches	Size of Cutter, Inches	Height of Cutter Point	Extra Cutters, Each	Price Each, Complete
100-L	100-S	100-R	$\frac{1}{2} \times \frac{5}{8} \times 6$	$\frac{3}{8}$	$\frac{3}{8}$	\$0.25	\$1.90
101-L	101-S	101-R	$\frac{5}{8} \times \frac{3}{4} \times 7\frac{1}{2}$	$\frac{1}{4}$	$\frac{11}{16}$	.30	2.25
201-L	201-S	201-R	$\frac{3}{4} \times \frac{7}{8} \times 8\frac{1}{2}$	$\frac{1}{8}$	$\frac{11}{16}$	.45	2.85
102-L	102-S	102-R	$\frac{7}{8} \times 1 \times 9\frac{1}{2}$	$\frac{3}{8}$	$\frac{11}{16}$	.65	3.65
301-L	301-S	301-R	1 x 1 $\frac{1}{8}$ x 10 $\frac{1}{2}$	$\frac{1}{2}$	1 $\frac{1}{16}$	1.00	4.60
103-L	103-S	103-R	1 $\frac{1}{8}$ x 1 $\frac{1}{4}$ x 11 $\frac{1}{2}$	$\frac{1}{2}$	1 $\frac{1}{8}$	1.45	5.80
104-L	104-S	104-R	1 $\frac{3}{8}$ x 1 $\frac{1}{2}$ x 13 $\frac{1}{2}$	$\frac{5}{8}$	1 $\frac{1}{8}$	2.50	8.60
105-L	105-S	105-R	1 $\frac{5}{8}$ x 1 $\frac{3}{4}$ x 15 $\frac{1}{2}$	$\frac{3}{4}$	1 $\frac{1}{2}$	4.10	13.80
106-L	106-S	106-R	1 $\frac{3}{8}$ x 2 x 17 $\frac{1}{2}$	$\frac{7}{8}$	1 $\frac{3}{4}$	6.00	20.50
107-L	107-S	107-R	2 $\frac{1}{8}$ x 2 $\frac{1}{4}$ x 19 $\frac{1}{2}$	1	2	8.60	27.50

ARMSTRONG SIDE TOOLS

Off-Set Right Hand Side Tool



FIG. 3343

Off-Set Left Hand Side Tool



FIG. 3344

Straight Left Hand Side Tool



FIG. 3345

Straight Right Hand Side Tool



FIG. 3346

Price includes Wrench and One High Speed Cutter.

Off-Set		Straight		Size of Shank, Inches	Extra Cutters, Each	Price Each, Complete
No. Left Hand	No. Right Hand	No. Left Hand	No. Right Hand			
69-L	69-R	79-L	79-R	$\frac{1}{8} \times \frac{3}{4}$	\$0.55	\$2.40
70-L	70-R	80-L	80-R	$\frac{3}{8} \times \frac{7}{8}$	.60	2.65
71-L	71-R	81-L	81-R	$\frac{1}{2} \times 1\frac{1}{8}$	.95	3.00
72-L	72-R	82-L	82-R	$\frac{5}{8} \times 1\frac{3}{8}$	1.60	3.75
73-L	73-R	83-L	83-R	$\frac{3}{4} \times 1\frac{5}{8}$	2.40	5.00
74-L	74-R	84-L	84-R	$\frac{7}{8} \times 1\frac{3}{4}$	3.60	6.25
75-L	75-R	85-L	85-R	1 x 2	5.00	8.25
76-L	76-R	86-L	86-R	1 $\frac{1}{4}$ x 2 $\frac{1}{4}$	7.75	11.00

ARMSTRONG CUTTING-OFF TOOLS

STRAIGHT AND OFF-SET SHANK

Right Hand Tool



FIG. 3347

Left Hand Tool



FIG. 3348

Straight Tool



FIG. 3349

Price includes Wrench and One High Speed Cutter.

Left Hand Off-Set No.	No. Shank Straight	Right Hand Off-Set No.	Size of Holder, Inches	Size of Cutter, Inches	Extra Cutters, Each	Price Each, Complete
29-L	19	29-R	$\frac{1}{8} \times \frac{3}{4}$	$\frac{1}{8} \times \frac{1}{2}$	\$0.60	\$1.90
30-L	20	30-R	$\frac{3}{8} \times \frac{7}{8}$	$\frac{1}{2} \times \frac{5}{8}$	.60	1.90
31-L	21	31-R	$\frac{1}{2} \times 1\frac{1}{8}$	$\frac{3}{8} \times \frac{3}{4}$	.85	2.15
32-L	22	32-R	$\frac{5}{8} \times 1\frac{3}{8}$	$\frac{1}{2} \times \frac{7}{8}$	1.30	2.75
33-L	23	33-R	$\frac{3}{4} \times 1\frac{5}{8}$	$\frac{7}{8} \times 1$	2.15	3.60
34-L	24	34-R	$\frac{7}{8} \times 1\frac{3}{4}$	$\frac{7}{8} \times 1\frac{1}{8}$	2.75	4.50
35-L	25	35-R	1 x 2	$\frac{3}{4} \times 1\frac{1}{4}$	4.00	5.75
36-L	26	36-R	1 $\frac{1}{4}$ x 2 $\frac{1}{4}$	$\frac{3}{4} \times 1\frac{3}{8}$	4.65	7.75

In ordering cutters, state whether same are for use in straight, right or left hand tool.

ARMSTRONG THREADING TOOLS



FIG. 3350

Each tool is equipped with one single point cutter V, U. S. or Whitworth Standard and a drop forged wrench.

No.	Size of Holder, Inches	Price Each, Complete	
		With Carbon Steel Cutter	With High Speed Cutter
00T	$\frac{1}{16} \times \frac{3}{4} \times 5$	\$2.25	\$2.75
50	$\frac{3}{16} \times \frac{7}{8} \times 5$	2.25	2.75
51	$\frac{1}{8} \times 1 \frac{1}{8} \times 6$	2.75	3.35
52	$\frac{3}{8} \times 1 \frac{3}{8} \times 7$	3.50	4.25
53	$\frac{3}{4} \times 1 \frac{5}{8} \times 8$	4.50	5.50
54	$\frac{7}{8} \times 1 \frac{3}{4} \times 9$	5.50	6.50
55	1 x 2 x 10	7.00	8.25

Note—In ordering tools equipped with U. S. or Whitworth cutters be careful to specify pitch or number of threads per inch wanted. Tools equipped with single point sharp V cutter will always be shipped unless otherwise ordered.

Tools with carbon steel cutters will be sent if High Speed is not specified.

ARMSTRONG KNURLING TOOL

No. 1K

No. 3K Revolving Head



FIG. 3351



FIG. 3352

No.	Size, Inches	Price Each, Complete	Extra Knurls, Per Pair
1-K	$\frac{1}{2} \times 1 \frac{1}{8} \times 6 \frac{1}{2}$	\$4.50	\$0.75
3-K	$\frac{1}{2} \times 1 \frac{1}{8} \times 6 \frac{1}{2}$	6.00	.75

ARMSTRONG KNURLING TOOL
WITH REVOLVING HEAD

The advantages of this tool are apparent at a glance. The revolving head is fitted with three pairs of knurls, fine, medium and coarse, either of which can be used without the inconvenience and loss of time incident to changing knurls.

Illustration shows full size Diamond Knurling.

Note—Knurls can be furnished coarse, medium and fine in either Straight line or Diamond pattern. Medium Diamond Knurls will be sent with tool when not otherwise specified.

Standard width of Knurl is $\frac{1}{4}$ inch, but Knurls with full width face ($\frac{3}{8}$ inch) will be furnished at regular price when required and so specified.

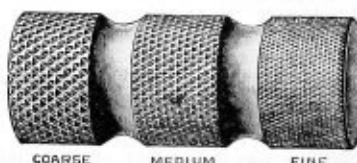


FIG. 3353



FIG. 3354

ARMSTRONG BORING TOOLS**FOR USE ON LATHES WITH CLAMP TOOL REST**

Require no forging or tempering and very little grinding. They are always ready for use, are very stiff and will bore close up to a shoulder or bottom.

Price List, Complete with Holder and Bar, straight and 45 degree End Caps, Two High Speed Cutters and Double Head Wrench.

No.	Size of Shank, Inches	Diam. of Bar, Inches	Length of Bar, Inches	Size of Cutter, Inches Square	Extra Cutters, Each	Price Each, Complete
108	$\frac{3}{8} \times \frac{7}{8}$	$\frac{7}{8}$	9	$\frac{3}{8}$	\$0.25	\$2.75
109	1 x $1\frac{1}{8}$	$\frac{3}{4}$	11	$\frac{1}{4}$	.30	3.25
110	$1\frac{1}{4}$ x $1\frac{3}{8}$	$\frac{1}{2}$	13	$\frac{7}{8}$	.45	4.35
111	$1\frac{3}{8}$ x $1\frac{5}{8}$	$1\frac{1}{8}$	16	$\frac{3}{8}$	.65	6.25
112	$1\frac{3}{4}$ x $1\frac{7}{8}$	$1\frac{1}{2}$	18	$\frac{1}{2}$	.90	8.75
113	2 x $2\frac{1}{8}$	$1\frac{1}{2}$	21	$\frac{3}{4}$	1.20	11.50
114	$2\frac{1}{4}$ x $2\frac{3}{8}$	$1\frac{1}{2}$	24	$\frac{3}{8}$	2.00	15.90
115	$2\frac{3}{4}$ x $2\frac{7}{8}$	$2\frac{1}{4}$	30	$\frac{3}{4}$	3.60	20.25

ARMSTRONG BORING TOOLS

Price List, Complete with Holder and Bar, straight and 45 degree End Caps, Two High Speed Cutters and Double Head Wrench.

No.	Size Shank, Inches	Diam. Bar, Inch	Size Cutter, Inch Square	Extra Cutters, Each	Price Each, Complete
00B	$\frac{1}{8} \times \frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{8}$	\$0.25	\$3.25
8	$\frac{3}{8} \times \frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	.25	3.25
9	$\frac{1}{2}$ x $1\frac{1}{8}$	$\frac{3}{4}$	$\frac{1}{4}$	.30	3.85
10	$\frac{5}{8}$ x $1\frac{3}{8}$	$\frac{1}{2}$	$\frac{7}{8}$	.45	5.10
11	$\frac{3}{4}$ x $1\frac{5}{8}$	$1\frac{1}{8}$	$\frac{3}{8}$	.65	7.25
12	$\frac{7}{8}$ x $1\frac{3}{4}$	$1\frac{1}{8}$	$\frac{1}{2}$	.90	10.75
13	1 x 2	$1\frac{1}{2}$	$\frac{1}{2}$	1.20	15.00



FIG. 3359

ARMSTRONG 3-BAR BORING TOOL

The set comprises the Holder and three Armstrong Patent Boring Bars, with straight and 45 degree end caps, six High Speed Cutters, and an Armstrong Combination Wrench.

Note—Bolt Head and Bottom part of Holder are made of ample size to allow for fitting, which is necessary on account of the great variation in height of centers above slide rest and difference in sizes of T slots.

Fitting—An extra charge of \$1.00 net will be made for tools ordered fitted to special dimensions.

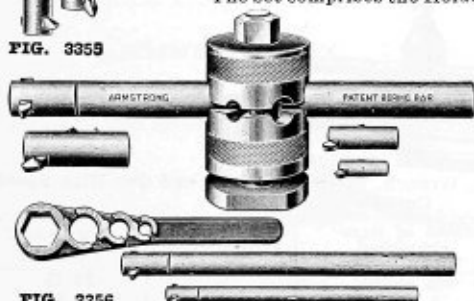


FIG. 3356

No. of Tool	1-B	2-B	3-B	4-B
Diam. Bars....	$\frac{1}{8}$, $\frac{3}{8}$, $1\frac{1}{8}$	$\frac{7}{8}$, $1\frac{1}{8}$, $1\frac{3}{8}$	$\frac{3}{8}$, $1\frac{1}{8}$, $1\frac{3}{8}$	$1\frac{1}{8}$, $1\frac{3}{8}$, $1\frac{5}{8}$
Length Bars....	8, 11, 16	9, 13, 18	11, 16, 21	13, 18, 24
Size Cutters....	$\frac{7}{8}$, $\frac{1}{4}$, $\frac{3}{8}$	$\frac{3}{8}$, $\frac{7}{8}$, $\frac{1}{2}$	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$	$\frac{3}{8}$, $\frac{7}{8}$, $\frac{3}{4}$
For Lathes....	14 to 16	16 to 18	20 to 22	24 to 32
Price .....each	\$13.00	17.25	22.75	30.00

ARMSTRONG ADJUSTABLE BORING TOOL



FIG. 3357

Price List, Complete Tools, including Holder, One Bar, Two High Speed Cutters and Wrench.

No.	Capacity of Holder, Diameter Bars, Inches	Size Bar Furnished, Inches	Size Cutter, Inches Square	For Lathes, Swinging Inches	Extra Cutters, Each	Price Each, Complete
212	$\frac{1}{4}$ to $1\frac{1}{8}$	$1\frac{1}{8}$ x21	$\frac{3}{8}$	14 to 18	\$0.65	\$16.50
213	$\frac{3}{8}$ to $1\frac{1}{2}$	$1\frac{1}{2}$ x24	$\frac{7}{8}$	16 to 20	.90	21.75
214	$\frac{1}{2}$ to $1\frac{1}{2}$	$1\frac{1}{2}$ x28	$\frac{1}{2}$	18 to 24	1.20	29.00
215	$\frac{5}{8}$ to $2\frac{1}{4}$	$2\frac{1}{4}$ x36	$\frac{5}{8}$	20 to 36	2.00	41.25

Note—Bolt Head is made large enough to allow for fitting T slots of various sizes. Fitting—An extra charge of \$0.50 net will be made for fitting Bolt Head to special dimensions.

Price List, Extra Bars, including One Bar of Size Specified, Two High Speed Cutters and Wrench.

Size of Bar		Size Cutter, Inches Square	Extra Cutters, Each	Price Each
Diameter	Length			
$\frac{3}{8}$ in.	14 in.	$\frac{3}{8}$	\$0.25	\$3.25
$\frac{1}{2}$ in.	16 in.	$\frac{1}{4}$	.30	4.00
$1\frac{1}{4}$ in.	18 in.	$\frac{1}{8}$	.45	5.10
$1\frac{1}{8}$ in.	21 in.	$\frac{3}{8}$	.65	6.50
$1\frac{1}{2}$ in.	24 in.	$\frac{7}{8}$	.90	8.75
$1\frac{1}{2}$ in.	28 in.	$\frac{1}{2}$	1.20	12.60
$2\frac{1}{4}$ in.	36 in.	$\frac{5}{8}$	2.00	16.25

ARMSTRONG BORING TOOL HOLDER FOR SMALL, LIGHT BORING, THREADING, ETC.



FIG. 3358

Price List. Price includes Holder, Wrench, Two Boring Bars and One High Speed Cutter.

No.	Size of Shank, Inches	Size of Bars Furnished, Diam. Inches	Size of Square Cutter, Inches	Price Each, Complete
15	$\frac{3}{8}$ x $\frac{3}{8}$	$\frac{1}{8}$ and $\frac{1}{4}$	$\frac{1}{4}$	\$2.75
16	$\frac{1}{2}$ x1	$\frac{1}{8}$ and $\frac{3}{8}$	$\frac{1}{8}$	3.50
17	$\frac{5}{8}$ x1 $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{3}{8}$	$\frac{3}{8}$	4.50
18	$\frac{3}{4}$ x1 $\frac{1}{2}$	$\frac{1}{2}$ and $\frac{7}{8}$	$\frac{7}{8}$	5.75

PRICE LIST OF EXTRA BORING BARS

Diameter	Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{7}{8}$
Length	inches	4	4 $\frac{1}{2}$	5	6	7	8
Price	each	\$0.20	.25	.30	.40	.55	.75

ARMSTRONG DRILL HOLDER **PATENTED**

FOR HOLDING MORSE TAPER SHANK DRILLS AND REAMERS

Saves Fingers and Drills.

This holder furnishes the simplest, safest and most efficient means for holding taper shank drills when using them on the lathe. Its use will eliminate 90 per cent of drill breakage in such work, mutilation of drill shanks and sockets, and injury to the operator.

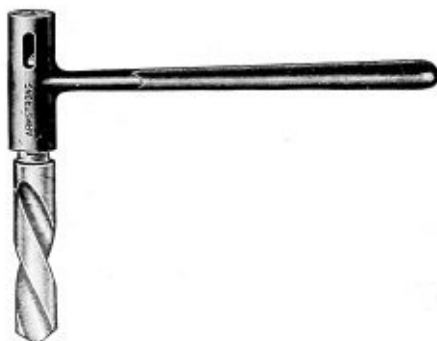


FIG. 3350

PRICE LIST

No.	Size Shank Morse Taper	Holds Drills Inches	Price Each
1	No. 1	$\frac{1}{8}$ to $\frac{3}{16}$	\$0.90
2	No. 2	$\frac{3}{16}$ to $\frac{3}{8}$	1.20
3	No. 3	$\frac{3}{8}$ to $1\frac{1}{4}$	1.60
4	No. 4	$1\frac{1}{4}$ to 2	2.60
5	No. 5	$2\frac{1}{8}$ to 3	4.00

ARMSTRONG "U" CLAMP DRILL HOLDER **PATENTED**

This tool is designed for use in holding Straight Shank Drills, Reamers or similar tools, with safety to the operator and without danger of injury to the tool held.



FIG. 3360

PRICE LIST

No.	Capacity, In.	Length, In.	Price, Each
200	$\frac{1}{4}$ to 1	11	\$1.20
300	$\frac{3}{8}$ to $1\frac{1}{2}$	13	1.60
400	$\frac{1}{2}$ to 2	$15\frac{1}{2}$	2.60
500	$\frac{3}{4}$ to 3	18	4.00

ARMSTRONG PLANER TOOL



FIG. 3361

Price List—Complete with Wrench and One High Speed Cutter.

No.	Size of Holder, Inches	Size of Cutter, Inches	Extra Cutters, Each	Price Each, Complete
40	$\frac{1}{2}$ x 1 x 7	$\frac{1}{4}$ x $\frac{3}{8}$	\$0.45	\$ 3.10
401	$\frac{5}{8}$ x $1\frac{1}{4}$ x $8\frac{1}{2}$	$\frac{1}{8}$ x $\frac{1}{8}$	.65	4.00
41	$\frac{3}{4}$ x $1\frac{1}{2}$ x 10	$\frac{3}{8}$ x $\frac{1}{2}$	.95	5.25
42	$1\frac{1}{8}$ x $1\frac{3}{4}$ x 13	$\frac{1}{2}$ x $\frac{3}{4}$	2.15	8.25
43	$1\frac{3}{8}$ x 2 x 16	$\frac{5}{8}$ x $\frac{7}{8}$	3.60	12.75
44	$1\frac{7}{8}$ x $2\frac{1}{4}$ x 19	$\frac{3}{4}$ x 1	5.30	19.50
45	$2\frac{1}{8}$ x $2\frac{3}{4}$ x 22	$\frac{7}{8}$ x $1\frac{1}{8}$	8.50	30.00

ARMSTRONG GANG PLANER TOOL

FOR PLANING LARGE SURFACES



FIG. 3362

This tool is especially adapted for surfacing large castings, and on this class of work it will effect a saving of 50 to 75 per cent in the time required to do the same job with a single point tool.

Price List—Complete with one set (four) High Speed Cutters, Wrench and Grinding Gage.

No.	Size Shank, Inches	Length Over All, Inches	Size Cutter, Inches	Feed Adjust., Inches	Extra Cutters, Each	Price Each, Complete
61	$1\frac{1}{4}$ x $1\frac{3}{4}$ x $7\frac{1}{2}$	10	$\frac{3}{8}$ x $\frac{1}{2}$	0 to $\frac{1}{4}$	\$0.85	\$13.00
62	$1\frac{5}{8}$ x $2\frac{1}{4}$ x 9	12	$\frac{1}{2}$ x $\frac{1}{8}$	0 to $\frac{3}{8}$	1.70	22.00
63*	2 x $2\frac{1}{2}$ x 11	14	$\frac{5}{8}$ x $\frac{7}{8}$	0 to $\frac{1}{2}$	2.80	38.50

ARMSTRONG GRINDER HOLDERS



FIG. 3363

No.	Holds Cutters	Price, Each
1-G	$\frac{3}{8}$ inch and $\frac{1}{4}$ inch.....	\$0.30
2-G	$\frac{1}{2}$ inch and $\frac{3}{8}$ inch.....	.35
3-G	$\frac{1}{2}$ inch and $\frac{1}{2}$ inch.....	.45
4-G	$\frac{5}{8}$ inch and $\frac{3}{4}$ inch.....	.60
5-G	$\frac{7}{8}$ inch, 1 inch and $1\frac{1}{8}$ inch.....	.85

ARMSTRONG SLOTTER TOOL WITH HOLLOW BAR



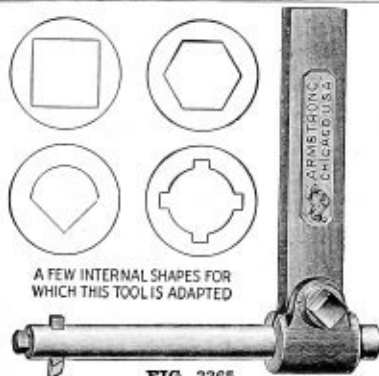
FIG. 3364

Price List—Complete with Wrench and One High Speed Cutter.

No.	For Slotting Machine, Inches Stroke	Diam. of Bar, Inches	Length Over All, Inches	Size of Cutter, Inches	Extra Cutters, Each	Price Each, Complete
91	6 and 8	1½	16	5/16 x 5/16	\$1.35	\$20.75
92	10 and 12	2	22	5/8 x 1½	1.80	31.00
93	14 and 16	2¼	27	7/8 x ¾	2.35	46.50
94	18 and 20	2½	32	¾ x 7/8	3.60	67.00
95	22 and 24	2¾	37	¾ x 1	5.30	98.50

ARMSTRONG EXTENSION SHAPER TOOL

This is an extremely rigid and convenient tool, well adapted for cutting internal key ways, or for any kind of work on the Shaper in which extra clearance is needed.



A FEW INTERNAL SHAPES FOR WHICH THIS TOOL IS ADAPTED

FIG. 3365

Price List—Complete with Holder and one Bar, one High Speed Cutter and Wrench.

No.	Size Shank, Inches	Size Bar, Inches	Size Cutter, Inches Square	Extra Cutters, Each	Price Each, Complete
47	½ x 1½	¾ x 10	5/16	\$0.45	\$3.00
48	5/8 x 1¾	1½ x 12	3/8	.65	3.75
49	¾ x 1½	1½ x 14	7/16	.90	5.25

Extra Bars and Bushings—Price includes Bar, one Bushing, a High Speed Cutter and Wrench.

Dimensions of Bar		Size of Cutter, Inches Square	With Bushing to Fit Shank Number	Extra Cutters, Each	Price Each
Diam., Inches	Length, Inches				
½	7½	5/16	47, 48 or 49	\$0.25	\$1.90
5/8	8½	3/8	47, 48 or 49	.30	2.00
¾	10	7/16	48 or 49	.45	2.20
1½	12	3/4	49	.65	2.50
1½	14	7/8	Without Bushing	.90	2.50

Note—In ordering be careful to give size of shank (or number of tool) in which bar is to be used. When this information is not given no bushing will be included.



**ARMSTRONG HIGH SPEED STEEL
CUTTER LENGTHS—HARDENED
SQUARES FOR TURNING AND BORING TOOLS**

For Turning Tools			For Boring Tools		
Size, Inches	Length, Inches	Price Each	Size, Inches	Length, Inches	Price Each
$\frac{3}{16}$	$1\frac{3}{4}$	\$0.15	$\frac{3}{16}$	1	\$0.10
$\frac{1}{4}$	$2\frac{1}{8}$	.20	$\frac{1}{8}$	$1\frac{1}{4}$	.10
$\frac{5}{16}$	$2\frac{3}{8}$	.35	$\frac{1}{4}$	$1\frac{1}{2}$	.12
$\frac{3}{8}$	$3\frac{1}{4}$	.55	$\frac{1}{2}$	$1\frac{3}{4}$	.18
$\frac{7}{16}$	$3\frac{3}{4}$	.90	$\frac{5}{16}$	$1\frac{1}{2}$	.24
$\frac{1}{2}$	$4\frac{1}{4}$	1.30	$\frac{3}{8}$	$2\frac{1}{4}$	.30
$\frac{5}{8}$	5	2.35	$\frac{7}{16}$	$1\frac{7}{8}$	.40
$\frac{3}{4}$	$5\frac{3}{4}$	3.85	$\frac{1}{2}$	$2\frac{3}{8}$	.50
$\frac{7}{8}$	$6\frac{1}{2}$	5.85	$\frac{1}{2}$	$2\frac{1}{2}$	.55
1	$7\frac{1}{4}$	8.35	$\frac{1}{2}$	$2\frac{7}{8}$	.75
$1\frac{1}{8}$	8	11.35	$\frac{1}{2}$	$2\frac{3}{4}$	.80
			$\frac{1}{2}$	$3\frac{1}{4}$	1.00
			$\frac{5}{8}$	$2\frac{3}{4}$	1.40
			$\frac{3}{4}$	4	1.80
			$\frac{3}{4}$	$3\frac{1}{8}$	2.75
			$\frac{3}{4}$	5	3.40



FLATS FOR PLANER AND SLOTTOR TOOLS

For Planer Tools			For Slotter and Gang Planer Tools		
$\frac{1}{4}$ x $\frac{3}{8}$	$2\frac{1}{2}$	\$0.35	$\frac{1}{16}$ x $\frac{3}{16}$	$3\frac{1}{2}$	\$1.20
$\frac{1}{8}$ x $\frac{1}{16}$	3	.55	$\frac{1}{8}$ x $\frac{1}{16}$	$3\frac{3}{4}$	1.60
$\frac{3}{8}$ x $\frac{1}{2}$	$3\frac{1}{2}$	.80	$\frac{1}{8}$ x $\frac{3}{8}$	$4\frac{1}{4}$	2.20
$\frac{1}{2}$ x $\frac{3}{4}$	$4\frac{1}{4}$	1.95	$\frac{3}{8}$ x $\frac{7}{8}$	5	3.35
$\frac{5}{8}$ x $\frac{3}{4}$	5	3.35	$\frac{3}{4}$ x 1	$5\frac{3}{4}$	5.00
$\frac{3}{4}$ x 1	6	5.00	$\frac{7}{8}$ x $\frac{1}{2}$	3	.70
$\frac{7}{8}$ x $1\frac{1}{8}$	7	8.20	$\frac{1}{2}$ x $\frac{1}{16}$	$3\frac{1}{2}$	1.50
			$\frac{5}{8}$ x $\frac{7}{8}$	4	2.55

ROUND FOR TURNING TOOLS

Size, Inches	Length, Inches	Price Each
$\frac{1}{4}$	$2\frac{3}{8}$	\$0.15
$\frac{5}{16}$	3	.30
$\frac{3}{8}$	$3\frac{1}{2}$	.50
$\frac{7}{16}$	$3\frac{7}{8}$	.75
$\frac{1}{2}$	$4\frac{1}{2}$	1.00
$\frac{5}{8}$	$5\frac{1}{2}$	1.95

BEVEL FOR CUTTING-OFF TOOLS

$\frac{5}{16}$ x $\frac{1}{2}$	$4\frac{1}{2}$	\$0.40
$\frac{3}{8}$ x $\frac{5}{8}$	5	.40
$\frac{1}{4}$ x $\frac{3}{4}$	6	.65
$\frac{1}{8}$ x $\frac{7}{8}$	7	.95
$\frac{1}{16}$ x 1	8	1.75
$\frac{1}{16}$ x $1\frac{1}{8}$	9	2.20
$\frac{1}{4}$ x $1\frac{1}{4}$	10	3.40
$\frac{1}{4}$ x $1\frac{3}{8}$	11	4.00

Note—Bevel Shapes are rolled to approximate size, but require grinding on edges to bring to exact size fitting Armstrong Cutting-Off and Side Tool Holders.

ARMSTRONG HIGH SPEED STEEL CUTTER LENGTHS—HARDENED

Require grinding only to make them ready for use in Armstrong Tool Holders.

SPECIAL SHAPE FOR SIDE TOOLS

	Size, Inches on Lines AA and BB	Length, Inches	Price Each
	$\frac{1}{8} \times \frac{1}{2}$	4½	\$0.45
	$\frac{3}{8} \times \frac{3}{8}$	5	.50
	$\frac{1}{2} \times \frac{3}{8}$	6	.85
	$\frac{1}{4} \times \frac{7}{8}$	7	1.45
	$\frac{1}{8} \times 1$	8	2.20
	$\frac{3}{8} \times 1\frac{1}{4}$	9	3.40
	$\frac{1}{2} \times 1\frac{3}{8}$	10	4.60
	$\frac{1}{2} \times 1\frac{1}{2}$	11	7.35
	$\frac{1}{2} \times 1\frac{5}{8}$	15	11.00

NOTE—Special Shapes are rolled to approximate size, but require grinding on edges to bring to exact size fitting Armstrong Cutting-Off and Side Tool Holders.

ARMSTRONG SPECIAL SELF-HARDENING TOOL HOLDER STEEL IN 3 FOOT BARS READY TO USE—NO TREATMENT REQUIRED

SQUARES  For use in Arm- strong Turning and Boring Tools	Size, Inches	Price Per 3 Ft. Bar	Size, Inches	Price Per 3 Ft. Bar
	$\frac{3}{16}$	\$1.20	$\frac{5}{8}$	\$11.10
	$\frac{1}{4}$	2.00	$\frac{3}{4}$	15.80
	$\frac{5}{16}$	3.00	$\frac{7}{8}$	21.30
	$\frac{3}{8}$	4.25	1	28.20
	$\frac{7}{8}$	5.60	$1\frac{1}{8}$	34.35
	$\frac{1}{2}$	7.10		
FLATS  For use in Arm- strong Planer and Slotter Tools	$\frac{1}{4} \times \frac{3}{8}$	\$3.10	$\frac{1}{2} \times \frac{3}{4}$	\$11.00
	$\frac{5}{16} \times \frac{1}{2}$	4.25	$\frac{3}{8} \times \frac{3}{4}$	12.00
	$\frac{3}{8} \times \frac{1}{2}$	5.85	$\frac{5}{8} \times \frac{7}{8}$	15.60
	$\frac{7}{8} \times \frac{1}{2}$	8.15	$\frac{3}{4} \times 1$	20.65
	$\frac{1}{2} \times 1\frac{1}{8}$	10.35	$\frac{7}{8} \times 1\frac{1}{8}$	27.30
 ROUNDS For use in Arm- strong Turn- ing Tools	$\frac{1}{4}$	\$1.65	$\frac{7}{8}$	\$4.45
	$\frac{5}{16}$	2.40	$\frac{1}{2}$	5.65
	$\frac{3}{8}$	3.35	$\frac{3}{8}$	8.80

 BEVEL For use in Armstrong Cutting-Off Tools	Size of Steel, Inches	Price 3 Ft. Bar	 SPECIAL SHAPE For use in Armstrong Side Tools	Size of Steel on Lines AA and BB, Inches	Price 3 Ft. Bar
	$\frac{5}{16} \times \frac{1}{2}$	\$2.40		$\frac{1}{8} \times \frac{1}{2}$	\$2.50
	$\frac{3}{8} \times \frac{5}{8}$	2.40		$\frac{3}{8} \times \frac{5}{8}$	3.30
	$\frac{1}{4} \times \frac{3}{4}$	3.55		$\frac{1}{2} \times \frac{3}{4}$	4.15
	$\frac{1}{8} \times \frac{7}{8}$	3.75		$\frac{1}{4} \times 1$	5.85
	$\frac{1}{8} \times 1$	6.00		$\frac{1}{8} \times 1$	7.60
	$\frac{3}{8} \times 1\frac{1}{8}$	6.60		$\frac{3}{8} \times 1\frac{1}{4}$	10.60
	$\frac{1}{4} \times 1\frac{1}{4}$	9.25		$\frac{1}{2} \times 1\frac{3}{8}$	12.75
	$\frac{1}{4} \times 1\frac{5}{8}$	9.60		$\frac{1}{2} \times 1\frac{1}{2}$	18.65

NOTE—Steel for Side Tools and Cutting-Off Tools is rolled to approximate size, but requires grinding on edges to bring to exact size fitting Armstrong Cutting-Off and Side Tool Holders.

MILLING CUTTERS



FIG. 3366

Number	Diameter of Cutter, Inches	Width of Face, Inches	Size of Hole, Inches	Price Carbon Steel, Each	Price High Speed Steel, Each	Number	Diameter of Cutter, Inches	Width of Face, Inches	Size of Hole, Inches	Price Carbon Steel, Each	Price High Speed Steel, Each
M 9	2 1/4	3/16	7/8	\$1.30	\$2.05	M 46	2 3/4	1	1	\$3.10	\$5.35
M 10	2 1/4	1/2	7/8	1.75	2.85	M 47	2 3/4	1 1/4	1	3.25	5.50
M 11	2 1/4	1	7/8	2.50	4.55	M 48	2 3/4	1 1/4	1	3.40	6.10
M 12	2 1/4	1 3/4	7/8	3.30	5.80	M 49	2 3/4	1 1/2	1	3.75	6.80
M 14	2 1/2	3/16	1	1.90	2.10	M 50	2 3/4	1 3/4	1	4.00	7.40
M 15	2 1/2	1/4	1	1.40	2.30	M 51	2 3/4	2	1	4.20	7.95
M 16	2 1/2	5/16	1	1.50	2.55	M 52	2 3/4	2 1/2	1	4.60	9.00
M 17	2 1/2	3/8	1	1.60	2.65	M 53	2 3/4	3	1	5.00	10.00
M 18	2 1/2	7/16	1	1.70	2.80	M 54	2 3/4	3 1/2	1	5.50	11.20
M 19	2 1/2	1/2	1	1.80	3.00	M 55	2 3/4	4	1 1/4	6.00	12.65
M 20	2 1/2	9/16	1	1.90	3.20	M 56	2 3/4	5	1 1/4	7.40	15.30
M 21	2 1/2	5/8	1	2.00	3.45	M 57	2 3/4	6	1 1/4	10.00	19.80
M 22	2 1/2	1 1/16	1	2.10	3.55	M 61	3	3/16	1	1.35	2.35
M 23	2 1/2	3/8	1	2.20	3.80	M 62	3	1/4	1	1.60	2.75
M 24	2 1/2	1 3/16	1	2.30	4.00	M 63	3	5/16	1	1.85	3.20
M 25	2 1/2	7/8	1	2.40	4.15	M 64	3	3/8	1 1/4	2.10	3.55
M 26	2 1/2	1	1	2.60	4.55	M 65	3	7/16	1 1/4	2.25	3.85
M 27	2 1/2	1 1/8	1	2.75	4.85	M 66	3	1/2	1 1/4	2.40	4.10
M 28	2 1/2	1 1/4	1	2.90	5.15	M 67	3	9/16	1 1/4	2.55	4.40
M 29	2 1/2	1 1/2	1	3.10	5.65	M 68	3	5/8	1 1/4	2.70	4.70
M 30	2 1/2	1 3/4	1	3.40	6.30	M 69	3	1 1/16	1 1/4	2.85	4.95
M 31	2 1/2	2	1	3.70	6.90	M 70	3	3/4	1 1/4	3.00	5.20
M 32	2 1/2	2 1/4	1	3.90	7.35	M 71	3	7/8	1 1/4	3.30	5.75
M 33	2 1/2	2 1/2	1	4.10	7.85	M 72	3	1	1 1/4	3.60	6.35
M 34	2 1/2	2 3/4	1	4.25	8.20	M 73	3	1 1/4	1 1/4	4.00	7.20
M 35	2 1/2	3	1	4.50	8.80	M 74	3	1 1/2	1 1/4	4.30	7.85
M 36	2 1/2	3 1/2	1	5.00	9.90	M 75	3	1 3/4	1 1/4	4.50	8.45
M 37	2 1/2	4	1	5.50	11.00	M 76	3	2	1 1/4	4.70	9.00
M 38	2 3/4	3/16	1	1.30	2.20	M 77	3	2 1/2	1 1/4	5.20	10.35
M 39	2 3/4	1/4	1	1.50	2.50	M 78	3	3	1 1/4	5.40	11.20
M 40	2 3/4	5/16	1	1.60	2.70	M 79	3	3 1/2	1 1/4	5.90	12.50
M 41	2 3/4	3/8	1	1.80	2.90	M 80	3	4	1 1/4	6.40	13.80
M 42	2 3/4	7/16	1	1.85	3.20	M 81	3	5	1 1/4	7.80	16.90
M 43	2 3/4	1/2	1	1.90	3.50	M 82	3	6	1 1/4	10.80	22.15
M 44	2 3/4	9/16	1	2.00	3.55	M 83	3 1/2	3/16	1	1.45	2.65
M 45	2 3/4	5/8	1	2.10	3.90	M 84	3 1/2	1/4	1	1.70	3.10
M 45A	2 3/4	1 1/16	1	2.30	4.05	M 85	3 1/2	5/16	1	2.05	3.65
M 45B	2 3/4	3/4	1	2.50	4.35	M 86	3 1/2	3/8	1	2.40	4.25
M 45C	2 3/4	7/8	1	2.85	4.95	M 87	3 1/2	7/16	1	2.75	4.40

Cutters of 3/4-inch face and over have teeth of a spiral form.

Cutters varying from the above list are made to order for any required size.

MILLING CUTTERS—CONTINUED



FIG. 3367

Number	Diameter of Cutter, Inches	Width of Face, Inches	Size of Hole, Inches	Price Carbon Steel, Each	Price High Speed Steel, Each	Number	Diameter of Cutter, Inches	Width of Face, Inches	Size of Hole, Inches	Price Carbon Steel, Each	Price High Speed Steel, Each
M 88	3 1/2	1 1/2	1 1/4	\$3.15	\$5.45	M124	4	1 3/4	1 1/2	\$7.05	\$13.70
M 89	3 1/2	9/16	1 1/4	3.30	5.75	M125	4	2	1 1/4	7.45	14.85
M 90	3 1/2	5/8	1 1/4	3.45	6.05	M126	4	2	1 1/2	7.45	14.85
M 91	3 1/2	11/16	1 1/2	3.65	6.45	M127	4	2 1/2	1 1/2	8.40	17.20
M 92	3 1/2	3/4	1 1/4	3.85	6.80	M128	4	3	1 1/2	9.00	19.10
M 93	3 1/2	7/8	1 1/4	4.35	7.70	M128A	4	3	1 1/2	9.00	19.10
M 94	3 1/2	1	1 1/4	4.75	8.25	M129	4	3 1/2	1 1/4	10.00	21.55
M 95	3 1/2	1 1/4	1 1/4	5.15	9.10	M130	4	4	1 1/4	11.00	23.95
M 96	3 1/2	1 1/2	1 1/2	5.60	10.00	M131	4	4	1 1/2	11.00	23.95
M 97	3 1/2	1 3/4	1 1/2	6.00	11.30	M132	4	5	1 1/2	13.50	28.95
M 98	3 1/2	2	1 1/2	6.40	12.30	M133	4	5	1 1/2	13.50	28.95
M 99	3 1/2	2 1/2	1 1/4	6.90	13.80	M134	4	6	1 1/4	15.50	34.45
M100	3 1/2	3	1 1/4	7.40	15.35	M136	4	6	1 1/2	15.50	34.45
M101	3 1/2	3 1/2	1 1/4	8.15	16.70	M137	4 1/2	8	1 3/4	3.35	6.20
M102	3 1/2	4	1 1/4	9.15	19.30	M138	4 1/2	8	2	3.35	6.20
M103	3 1/2	5	1 1/4	10.40	22.20	M139	4 1/2	7 1/8	1 3/4	3.75	6.90
M104	3 1/2	6	1 1/4	11.90	26.30	M140	4 1/2	7 1/8	2	3.75	6.90
M104A	4	1 1/4	1	2.00	3.80	M141	4 1/2	1 1/2	1 3/4	4.10	7.50
M104B	4	9/16	1	2.50	4.55	M142	4 1/2	1 1/2	2	4.10	7.50
M104C	4	3/8	1	3.00	5.35	M143	4 1/2	9/16	1 3/4	4.40	8.15
M105	4	1/4	1 1/4	2.00	3.80	M144	4 1/2	9/16	2	4.40	8.15
M106	4	5/16	1 1/4	2.50	4.55	M145	4 1/2	5/8	1 3/4	4.60	8.60
M107	4	3/8	1 1/4	3.00	5.35	M146	4 1/2	5/8	2	4.60	8.60
M108	4	7/16	1 1/4	3.50	6.15	M147	4 1/2	11/16	1 3/4	4.85	9.10
M109	4	1/2	1 1/4	3.90	6.85	M148	4 1/2	11/16	2	4.85	9.10
M110	4	5/8	1 1/2	3.90	6.85	M149	4 1/2	3/4	1 3/4	5.10	9.60
M111	4	9/16	1 1/4	4.10	7.25	M150	4 1/2	3/4	2	5.16	9.60
M112	4	5/8	1 1/4	4.30	7.65	M151	4 1/2	7/8	1 3/4	5.50	10.50
M113	4	11/16	1 1/4	4.60	8.05	M152	4 1/2	7/8	2	5.50	10.50
M114	4	3/4	1 1/4	4.70	8.45	M153	4 1/2	1	1 3/4	6.00	11.55
M115	4	7/8	1 1/4	4.70	8.45	M154	4 1/2	1	2	6.00	11.55
M116	4	1 1/8	1 1/2	5.15	9.30	M155	4 1/2	1 1/8	1 3/4	6.60	13.00
M117	4	1	1 1/2	5.65	10.25	M156	4 1/2	1 1/8	2	6.60	13.00
M118	4	1	1 1/2	5.65	10.25	M157	4 1/2	1 1/8	1 3/4	7.25	14.60
M119	4	1 1/4	1 1/2	6.25	11.60	M158	4 1/2	1 1/8	2	7.25	14.60
M120	4	1 1/4	1 1/2	6.25	11.60	M159	4 1/2	1 1/4	1 3/4	8.00	16.30
M121	4	1 1/2	1 1/2	6.65	12.70	M160	4 1/2	1 1/4	2	8.00	16.30
M122	4	1 3/8	1 1/2	6.65	12.70	M161	4 1/2	2	1 3/4	8.75	18.00
M123	4	1 3/4	1 1/4	7.05	13.70	M162	4 1/2	2	2	8.75	18.00

Cutters of 3/4-inch face and over have teeth of a spiral form.

Cutters varying from the above list are made to order of any required size.

SIDE MILLING CUTTERS

Solid Tooth



FIG. 3363

Inserted Tooth



FIG. 3369

WITH SOLID TEETH

No.	Diam., Inches	Width Face, In.	Hole, Inches	Price Carbon Steel, Each	Price High Speed Steel, Each	No.	Diam., Inches	Width of Face, In.	Hole, Inches	Price Carb'n Steel, Each	Price High Speed Steel, Each
S 10	2	$\frac{3}{16}$	$\frac{1}{2}$	\$1.85	\$3.05	S 33	$2\frac{1}{2}$	$\frac{9}{16}$	1	\$4.55	\$7.65
S 11	2	$\frac{1}{4}$	$\frac{1}{2}$	2.00	3.25	S 34	$2\frac{1}{2}$	$\frac{5}{8}$	1	4.55	7.65
S 12	2	$\frac{5}{8}$	$\frac{1}{2}$	2.20	3.55	S 35	4	$\frac{1}{2}$	1	5.10	8.55
S 13	2	$\frac{3}{8}$	$\frac{5}{8}$	1.85	3.05	S 36	4	$\frac{1}{2}$	1	5.55	9.45
S 14	2	$\frac{1}{4}$	$\frac{5}{8}$	2.00	3.25	S 37	4	$\frac{1}{2}$	$\frac{7}{8}$	5.55	9.45
S 15	2	$\frac{1}{4}$	$\frac{5}{8}$	2.20	3.55	S 38	4	$\frac{1}{2}$	$\frac{1}{2}$	5.55	9.45
S 16	$2\frac{1}{2}$	$\frac{1}{4}$	$\frac{7}{8}$	2.20	3.30	S 39	4	$\frac{1}{2}$	1	6.00	10.40
S 17	$2\frac{1}{2}$	$\frac{5}{16}$	$\frac{7}{8}$	2.30	3.60	S 40	4	$\frac{1}{2}$	1	6.50	11.35
S 18	$2\frac{1}{2}$	$\frac{9}{16}$	$\frac{7}{8}$	2.45	3.70	S 41	5	$\frac{3}{4}$	1	6.35	12.45
S 19	$2\frac{1}{2}$	$\frac{7}{16}$	$\frac{7}{8}$	2.55	3.85	S 42	5	$\frac{1}{2}$	$1\frac{1}{4}$	6.35	12.45
S 20	$2\frac{1}{2}$	$\frac{1}{2}$	$\frac{7}{8}$	2.65	4.10	S 43	5	$\frac{1}{2}$	1	6.90	13.65
S 21	$2\frac{3}{4}$	$\frac{1}{4}$	$\frac{7}{8}$	2.30	3.55	S 44	5	1	1	7.80	15.05
S 22	$2\frac{3}{4}$	$\frac{5}{16}$	$\frac{7}{8}$	2.50	3.80	S 45	6	$\frac{3}{4}$	1	7.60	15.35
S 23	$2\frac{3}{4}$	$\frac{3}{8}$	$\frac{7}{8}$	2.65	4.00	S 46	6	$1\frac{1}{16}$	$1\frac{1}{4}$	8.65	18.55
S 24	$2\frac{3}{4}$	$\frac{1}{2}$	$\frac{7}{8}$	2.75	4.35	S 47	6	$1\frac{1}{16}$	$1\frac{1}{2}$	8.65	18.55
S 25	$2\frac{3}{4}$	$\frac{5}{8}$	$\frac{7}{8}$	2.80	4.45	S 47 A	6	1	1	8.65	18.55
S 26	3	$\frac{1}{4}$	1	2.45	3.85	S 48	7	1	$1\frac{1}{4}$	16.10	28.95
S 27	3	$\frac{5}{16}$	1	2.75	4.35	S 49	7	$1\frac{1}{8}$	$1\frac{1}{4}$	17.25	31.55
S 28	3	$\frac{3}{8}$	1	3.00	4.75	S 50	8	1	$1\frac{1}{4}$	19.55	37.30
S 29	3	$\frac{7}{16}$	1	3.20	5.10	S 51	8	$1\frac{3}{8}$	$1\frac{1}{4}$	23.00	46.65
S 30	3	$\frac{1}{2}$	1	3.35	5.40	S 52	8	$1\frac{3}{8}$	$1\frac{1}{2}$	23.00	46.65
S 31	$3\frac{1}{2}$	$\frac{7}{16}$	1	3.75	5.75	S 53	8	$1\frac{3}{8}$	$1\frac{3}{4}$	23.00	46.65
S 32	$3\frac{1}{2}$	$\frac{1}{2}$	1	4.20	6.95	S 54	8	$1\frac{3}{8}$	2	23.00	46.65

Solid Tooth Cutters are often used in pairs for sizing nuts, bolt heads, etc., and are then called Straddle Mills.

They have teeth upon both sides and edges. Other sizes made to order.

WITH INSERTED TEETH

Number	Diameter, Inches	Width of Face, Inches	Hole, Inches	Price with Carbon Steel Blades, Each	Price with High Speed Steel Blades, Each
S 100	6	2	$1\frac{1}{2}$	\$15.00	\$15.00
S 101	7	2	$1\frac{1}{4}$	17.50	17.50
S 102	8	2	$1\frac{1}{2}$	20.00	20.00
S 103	9	2	$1\frac{1}{2}$	22.50	22.50
S 104	10	2	$1\frac{1}{2}$	25.00	25.00

Other sizes made to order. Prices on application.

CUTTERS FOR TAPS AND REAMERS

For Grooving Taps and Reamers

For Grooving Taps



FIG. 3370



FIG. 3371

CUTTERS FOR GROOVING TAPS AND REAMERS

Number	Diameter of Tap, Inches	No. of Teeth in Tap	Diameter of Cutter, Inches	Hole in Cutter, Inches	Price Carbon Steel, Each	Price High Speed Steel, Each
L10	0 to $\frac{1}{8}$	4	2	1	\$2.00	\$2.85
L11	$\frac{5}{32}$ to $\frac{3}{8}$	4	2	1	2.10	3.00
L12	$\frac{9}{32}$ to $\frac{7}{16}$	4	$2\frac{1}{8}$	1	2.20	3.20
L13	$\frac{7}{16}$ to $\frac{1}{2}$	4	$2\frac{1}{4}$	1	2.40	3.60
L14	$\frac{1}{2}$ to $\frac{5}{8}$	4	$2\frac{3}{8}$	1	2.40	3.70
L15	$\frac{5}{8}$ to $1\frac{1}{4}$	4	$2\frac{1}{2}$	1	2.70	4.30
L16	$\frac{1}{2}$ to $1\frac{1}{8}$	4	$2\frac{3}{8}$	1	2.70	4.55
L17	$1\frac{1}{4}$ to 2	4	$2\frac{7}{8}$	1	3.00	5.30

These cutters are also adapted for fluting reamers, for which purpose it is necessary only to cut one or more grooves of a less depth in order to flute unevenly.

CUTTERS FOR FLUTING REAMERS

Number	Diameter of Reamer, Inches	Number of Teeth in Reamer	Diameter of Cutter, Inches	Hole in Cutter, Inches	Price Carbon Steel, Each	Price High Speed Steel, Each
L10	$\frac{1}{8}$ to $\frac{3}{8}$	6	2	1	\$2.00	\$2.85
L11	$\frac{5}{32}$ to $\frac{3}{8}$	6	2	1	2.10	3.00
L12	$\frac{7}{32}$ to $\frac{1}{2}$	6	$2\frac{1}{8}$	1	2.20	3.20
L13	$\frac{1}{2}$ to $1\frac{1}{8}$	6 to 8	$2\frac{1}{4}$	1	2.40	3.60
L14	$1\frac{1}{8}$ to $1\frac{3}{4}$	8 to 10	$2\frac{3}{8}$	1	2.40	3.70
L15	$1\frac{3}{4}$ to 2	10	$2\frac{1}{2}$	1	2.70	4.30

CUTTERS FOR GROOVING TAPS

No.	Diam. of Tap, Inches	Diam. of Cutter, Inches	Hole in Cutter, Inches	Price Carb'n Steel, Each	Price High Speed Steel, Each	No.	Diam. of Tap, Inches	Diam. of Cutter, Inches	Hole in Cutter, Inches	Price Carb'n Steel, Each	Price High Speed Steel, Each
L50	0 to $\frac{1}{8}$	$1\frac{3}{4}$	1	\$2.00	\$2.85	L55	$1\frac{1}{2}$ to $1\frac{3}{4}$	$2\frac{1}{4}$	1	\$2.70	\$4.30
L51	$\frac{5}{32}$ to $\frac{1}{4}$	$1\frac{1}{4}$	1	2.10	3.00	L56	$1\frac{1}{2}$ to $1\frac{1}{2}$	$2\frac{3}{8}$	1	2.70	4.45
L52	$\frac{9}{32}$ to $\frac{5}{16}$	$1\frac{1}{8}$	1	2.20	3.15	L57	$1\frac{1}{2}$ to 2	$2\frac{3}{8}$	1	3.00	5.25
L53	$\frac{1}{2}$ to $\frac{5}{8}$	2	1	2.40	3.55	L58	$2\frac{1}{2}$ to $2\frac{1}{2}$	$3\frac{1}{8}$	1	3.40	5.50
L54	$1\frac{1}{8}$ to $1\frac{1}{2}$	$2\frac{1}{8}$	1	2.40	3.70	L59	$2\frac{1}{2}$ to 3	$3\frac{3}{8}$	1	3.80	6.00

These cutters are for grooving taps only and do not make so deep a groove in proportion to the width as the tap and reamer cutters.

CUTTERS FOR FLUTING REAMERS

No. of Cutter	Diam. of Reamer, Inches	No. of Teeth	Hole in Cutter, Inches	Price Carb'n Steel, Each	Price High Speed Steel, Each	No. of Cutter	Diam. of Reamer, Inches	No. of Teeth	Hole in Cutter, Inches	Price Carb'n Steel, Each	Price High Speed Steel, Each
L75	$\frac{1}{8}$ to $\frac{3}{16}$	6	1	\$2.00	\$3.10	L80	$1\frac{1}{8}$ to $1\frac{1}{2}$	10	1	\$2.70	\$4.15
L76	$\frac{3}{16}$ to $\frac{1}{4}$	6	1	2.10	3.10	L81	$1\frac{1}{8}$ to $2\frac{1}{8}$	12	1	2.70	4.30
L77	$\frac{1}{4}$ to $\frac{5}{16}$	6	1	2.20	3.30	L82	$2\frac{1}{4}$ to 3	14	1	3.00	4.75
L78	$\frac{5}{16}$ to $1\frac{1}{8}$	6 to 8	1	2.40	3.60	L83	$3\frac{1}{8}$ to $3\frac{1}{2}$	14	1	3.30	5.20
L79	$\frac{3}{4}$ to 1	8	1	2.40	3.75	L84	$3\frac{1}{8}$ to 5	14 to 16	1	3.70	5.70

These cutters can be sharpened by grinding without changing their form.

CONVEX AND CONCAVE CUTTERS

Convex



FIG. 3372

Concave



FIG. 3373

CONVEX CUTTERS

Number	Diameter of Circle, Inches	Diameter of Cutter, Inches	Size of Hole, Inches	Price, Carbon Steel, Each	Price, High Speed Steel, Each
C10	$\frac{1}{8}$	2	$\frac{7}{8}$	\$2.00	\$2.85
C11	$\frac{3}{16}$	2	$\frac{7}{8}$	2.25	2.90
C12	$\frac{1}{4}$	2	$\frac{7}{8}$	2.50	3.20
C13	$\frac{5}{16}$	$2\frac{1}{4}$	$\frac{7}{8}$	2.80	4.10
C14	$\frac{3}{8}$	$2\frac{1}{4}$	$\frac{7}{8}$	3.10	4.55
C15	$\frac{7}{16}$	$2\frac{1}{4}$	$\frac{7}{8}$	3.35	4.95
C16	$\frac{1}{2}$	$2\frac{1}{4}$	$\frac{7}{8}$	3.60	5.35
C17	$\frac{5}{8}$	$2\frac{3}{4}$	1	4.00	5.95
C18	$\frac{3}{4}$	3	1	4.40	7.10
C19	$\frac{7}{8}$	$3\frac{1}{4}$	1	4.80	8.00
C20	1	$3\frac{1}{4}$	1	5.25	8.80
C21	$1\frac{1}{8}$	4	$1\frac{1}{4}$	5.75	9.90
C22	$1\frac{1}{4}$	4	$1\frac{1}{4}$	6.25	10.80
C23	$1\frac{3}{8}$	$4\frac{1}{4}$	$1\frac{1}{4}$	7.00	12.20
C24	$1\frac{1}{2}$	$4\frac{1}{4}$	$1\frac{1}{4}$	7.75	13.90

CONCAVE CUTTERS

Number	Diameter of Circle, Inches	Diameter of Cutter, Inches	Size of Hole, Inches	Price, Carbon Steel, Each	Price, High Speed Steel, Each
C10A	$\frac{1}{8}$	2	$\frac{7}{8}$	\$2.40	\$3.50
C11A	$\frac{3}{16}$	2	$\frac{7}{8}$	2.70	3.95
C12A	$\frac{1}{4}$	2	$\frac{7}{8}$	3.00	4.40
C13A	$\frac{5}{16}$	$2\frac{1}{4}$	$\frac{7}{8}$	3.35	5.00
C14A	$\frac{3}{8}$	$2\frac{1}{4}$	$\frac{7}{8}$	3.70	5.55
C15A	$\frac{7}{16}$	$2\frac{1}{4}$	$\frac{7}{8}$	4.00	6.00
C16A	$\frac{1}{2}$	$2\frac{1}{4}$	$\frac{7}{8}$	4.30	6.50
C17A	$\frac{5}{8}$	$2\frac{3}{4}$	1	4.80	7.85
C18A	$\frac{3}{4}$	3	1	5.25	8.75
C19A	$\frac{7}{8}$	$3\frac{1}{4}$	1	5.75	10.00
C20A	1	$3\frac{1}{4}$	1	6.30	11.00
C21A	$1\frac{1}{8}$	4	$1\frac{1}{4}$	6.90	12.50
C22A	$1\frac{1}{4}$	4	$1\frac{1}{4}$	7.50	13.60
C23A	$1\frac{3}{8}$	$4\frac{1}{4}$	$1\frac{1}{4}$	8.40	15.70
C24A	$1\frac{1}{2}$	$4\frac{1}{4}$	$1\frac{1}{4}$	9.30	17.25

These cutters can be sharpened by grinding without changing their outline.

CUTTERS

For Spiral Mills

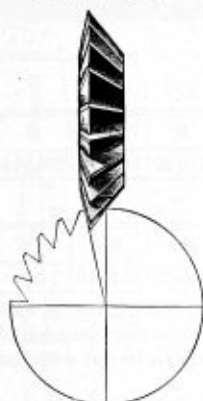


FIG. 3374

Angular
Right Hand

FIG. 3375

Angular
Left Hand With Side
Ground Concave

FIG. 3376

CUTTERS FOR SPIRAL MILLS

Number	Diameter, Inches	Thickness, Inches	Size of Hole, Inches	Price, Carbon Steel, Each	Price, High Speed Steel, Each
J150	2 1/4	1 1/2	7/8	\$2.65	\$4.10
J151	2 3/4	1 1/2	1	2.80	4.45
J152	3	1 1/2	1 1/4	3.35	5.40
* J153	3 1/4	1 1/2	1 1/2	3.75	6.15

* For cutting spiral mills 40° on one side and 12° on the other.

V-shaped cutter of any angle made to order.

These cutters are especially adapted to the cutting of spiral mills, either 40 degree, 48 degree or 53 degree angle on one side and 12 degrees on the other. They are right-hand cutters. The cut illustrates the cutter at work in the position required in cutting the teeth of a spiral cutter.

ANGULAR CUTTERS

Number	Diameter, Inches	Thickness, Inches	Hole, Inches	Price, Carbon Steel, Each	Price, High Speed Steel, Ea.
J10	2 1/2	1 1/2	7/8	\$2.65	\$4.10
J11	2 3/4	1 1/2	1	2.80	4.45
J12	3	1 1/2	1 1/4	3.35	5.40
J13	3 1/2	1 1/2	1 1/2	3.75	6.15

These cutters are made in 45 degree, 50 degree, 60 degree, 70 degree and 80 degree angles, both right and left-hand, suitable for cutting the teeth of cutters and mills.

ANGULAR CUTTERS WITH THREADED HOLES

Number	Diameter, Inches	Thickness, Inches	Hole, Inches	Thread	Price, Carbon Steel, Each	Price, High Speed Steel, Each
J25	2 1/4	7/16	3/8	20, L	\$2.25	\$3.15
J26	2 5/8	9/16	1/2	16, L	2.50	3.50

The cutters have angle of 60 degrees and are made both right and left-hand.

ANGULAR CUTTERS WITH SIDE GROUND CONCAVE

Number	Diameter, Inches	Thickness, Inches	Hole, Inches	Price, Carbon Steel, Each	Price, High Speed Steel, Ea.
J50	2 1/2	1 1/2	7/8	\$2.65	\$4.10
J51	2 3/4	1 1/2	1	2.80	4.45
J52	3	1 1/2	1 1/4	3.35	5.40
J53	3 1/4	1 1/2	1 1/2	3.75	6.15

These cutters are made in 45 degree, 50 degree, 60 degree, 70 degree and 80 degree angle, both right and left-hand. In ordering, state whether right or left-hand is wanted.

PATENT INVOLUTE CUTTERS

FOR TEETH OF GEAR WHEELS

REGULAR NUMBERS

EIGHT CUTTERS FOR EACH PITCH



FIG. 3377

Number.	1	2	3	4	5	6	7	8
Range...	15 to 24	25 to 34	35 to 44	45 to 54	55 to 64	65 to 74	75 to 84	85 to 94

HALF NUMBERS

Number.....	1½	2½	3½	4½	5½	6½	7½
Range..... teeth	80 to 134	42 to 54	30 to 34	23 to 25	19 to 20	15 to 16	13

These Gear Cutters are furnished, from 2 to 8 pitch inclusive, of half numbers, for the accommodation of those who require a finer division of the number of teeth to be cut with each cutter than can be cut with the regular number.

In ordering give the number of cutter and diametral pitch required. In ordering cutters for worm wheels, give number of teeth in wheel, diameter of worm, and number of threads to the inch.

Pitch	Diameter of Cutter, Carbon Steel, In.	Size of Hole, Inches	Price Per Cutter		Pitch	Diameter of Cutter, Carbon Steel, In.	Size of Hole, Inches	Price Per Cutter	
			Carbon Steel	High Speed Steel				Carbon Steel	High Speed Steel
*1	8½	2	\$45.00	\$85.00	14	2	⅞	\$2.70	\$3.75
*1¼	7¾	2	38.00	70.00	*15	2	⅞	2.60	3.60
*1½	7	1¾	32.00	55.00	16	2	⅞	2.50	3.50
*1¾	6½	1¾	24.00	45.00	18	1½	⅞	2.40	3.40
2	5¾	1½	16.00	35.00	20	1½	⅞	2.30	3.30
*2¼	5¼	1½	13.00	28.00	22	1½	⅞	2.20	3.20
*2½	5½	1½	11.00	23.00	24	1½	⅞	2.10	3.10
*2¾	5¼	1½	10.00	20.00	26	1½	⅞	2.00	3.00
3	4¾	1½	8.00	18.00	28	1½	⅞	1.80	3.00
*3¼	4½	1½	7.00	16.00	30	1½	⅞	1.80	3.00
*3½	4¼	1½	6.75	14.00	32	1½	⅞	1.80	3.00
*3¾	4	1½	6.50	13.00	*34	1½	⅞	1.80	3.00
4	3¾	1½	6.00	12.00	36	1½	⅞	1.80	3.00
*4¼	3¾	1½	5.50	11.00	*38	1½	⅞	1.80	3.00
5	3½	1½	5.00	10.00	40	1½	⅞	1.80	3.00
*5½	3½	1½	5.00	9.00	*44	1½	⅞	1.80	3.00
6	3	1	4.30	8.00	48	1½	⅞	1.80	3.00
7	2¾	1	4.10	7.00	*50	1½	⅞	1.80	3.00
8	2½	1	3.90	6.00	*56	1½	⅞	1.80	3.00
9	2¾	1	3.70	5.50	*60	1½	⅞	1.80	3.00
10	2¼	⅞	3.50	5.00	*64	1½	⅞	1.80	3.00
11	2¼	⅞	3.30	4.50	*70	1½	⅞	1.80	3.00
12	2¼	⅞	3.10	4.25	*80	1½	⅞	1.80	3.00
*13	2¼	⅞	2.90	4.00	*120	1½	⅞	1.80	3.00

*Cutters marked * are not kept in stock, but are made to order.

All gears of same pitch cut with these Cutters are interchangeable.



END MILLS

FIG. 3378

Number	Diam., Inches	No. of Taper	Length of Cut, Inches	Whole Length, Inches	Price Carbon Steel, Each	Price H'n Sp'd Steel, Each	Number	Diam., Inches	No. of Taper	Length of Cut, Inches	Whole Length, Inches	Price Carbon Steel, Each	Price H'n Sp'd Steel, Each
E 10	$\frac{1}{4}$	4	$\frac{13}{16}$	$2\frac{1}{16}$	\$1.00	\$1.40	E 30	$\frac{3}{8}$	7	$1\frac{1}{2}$	$5\frac{3}{4}$	\$2.10	\$3.55
E 11	$\frac{1}{4}$	5	$\frac{13}{16}$	$2\frac{1}{16}$	1.15	1.70	E 31	$\frac{3}{8}$	9	$1\frac{1}{4}$	$5\frac{3}{4}$	2.25	4.25
E 12	$\frac{5}{16}$	4	$\frac{7}{8}$	$2\frac{1}{2}$	1.00	1.40	E 32	$\frac{15}{16}$	7	$1\frac{3}{4}$	$5\frac{3}{4}$	2.10	3.70
E 13	$\frac{5}{16}$	5	$\frac{7}{8}$	$2\frac{1}{16}$	1.15	1.70	E 33	$\frac{15}{16}$	9	$1\frac{3}{4}$	$5\frac{3}{4}$	2.25	4.25
E 14	$\frac{3}{8}$	4	$\frac{7}{8}$	$2\frac{1}{2}$	1.10	1.55	E 34	1	7	$1\frac{3}{4}$	$5\frac{7}{8}$	2.15	3.80
E 15	$\frac{3}{8}$	5	$\frac{7}{8}$	$2\frac{1}{16}$	1.20	1.75	E 35	1	9	$1\frac{3}{4}$	$5\frac{7}{8}$	2.30	4.35
E 16	$\frac{7}{16}$	4	$\frac{15}{16}$	$2\frac{9}{16}$	1.10	1.55	E 36	$\frac{13}{16}$	7	$1\frac{7}{8}$	$5\frac{7}{8}$	2.15	3.95
E 17	$\frac{7}{16}$	5	$\frac{15}{16}$	$2\frac{3}{8}$	1.25	1.80	E 37	$\frac{13}{16}$	9	$1\frac{7}{8}$	$5\frac{7}{8}$	2.35	4.40
E 18	$\frac{1}{2}$	5	1	$2\frac{1}{16}$	1.30	1.90	E 38	$\frac{11}{16}$	7	2	6	2.25	4.20
E 19	$\frac{1}{2}$	7	$1\frac{1}{8}$	$2\frac{1}{2}$	1.45	2.40	E 39	$\frac{11}{16}$	9	2	$7\frac{1}{4}$	2.40	4.60
E 20	$\frac{9}{16}$	5	$1\frac{1}{16}$	$2\frac{1}{2}$	1.35	2.00	E 40	$\frac{13}{16}$	7	2	6	2.25	4.30
E 21	$\frac{9}{16}$	7	$1\frac{1}{4}$	$2\frac{1}{2}$	1.50	2.50	E 41	$\frac{13}{16}$	9	2	$7\frac{1}{4}$	2.50	4.90
E 22	$\frac{5}{8}$	5	$1\frac{1}{4}$	$2\frac{1}{16}$	1.45	2.20	E 42	$\frac{11}{4}$	7	2	6	2.25	4.45
E 23	$\frac{5}{8}$	7	$1\frac{1}{2}$	$2\frac{1}{2}$	1.70	2.80	E 43	$\frac{11}{4}$	9	2	$7\frac{1}{4}$	2.55	5.10
E 24	$\frac{11}{16}$	7	$1\frac{1}{2}$	$2\frac{1}{2}$	1.75	2.85	E 44	$\frac{15}{16}$	9	$2\frac{1}{4}$	$7\frac{3}{4}$	2.75	5.75
E 25	$\frac{11}{16}$	9	$1\frac{1}{2}$	$2\frac{1}{2}$	1.90	3.75	E 45	$\frac{13}{8}$	9	$2\frac{1}{4}$	$7\frac{3}{4}$	2.75	6.25
E 26	$\frac{3}{4}$	7	$1\frac{1}{2}$	$2\frac{1}{2}$	1.80	2.95	E 46	$\frac{17}{16}$	9	$2\frac{1}{4}$	$7\frac{3}{4}$	3.00	6.50
E 27	$\frac{3}{4}$	9	$1\frac{1}{2}$	$2\frac{1}{2}$	1.95	3.85	E 47	$\frac{11}{2}$	9	$2\frac{1}{4}$	$7\frac{3}{4}$	3.00	6.85
E 28	$\frac{13}{16}$	7	$1\frac{1}{2}$	$2\frac{1}{2}$	1.90	3.35	E 48	$\frac{11}{2}$	9	$2\frac{3}{8}$	$7\frac{3}{4}$	3.25	7.45
E 29	$\frac{13}{16}$	9	$1\frac{1}{2}$	$2\frac{1}{2}$	2.00	4.05	E 49	$\frac{13}{4}$	9	$2\frac{1}{2}$	$7\frac{3}{4}$	3.50	8.20



METAL SLITTING SAWS

FIG. 3379

Number	Diam., Inches	Th'n'ss, Inches	Hole, Inches	Price, Each	Number	Diam., Inches	Th'n'ss, Inches	Hole, Inches	Price, Each	Number	Diam., Inches	Th'n'ss, Inches	Hole, Inches	Price, Each
G50	$2\frac{1}{2}$	$\frac{1}{32}$	$\frac{7}{8}$	\$1.00	G62	4	$\frac{1}{32}$	1	\$2.25	G74	5	$\frac{5}{32}$	1	\$1.90
G51	$2\frac{1}{2}$	$\frac{3}{64}$	$\frac{7}{8}$	1.00	G63	4	$\frac{3}{64}$	1	1.45	G75	5	$\frac{3}{16}$	1	2.30
G52	$2\frac{1}{2}$	$\frac{1}{16}$	$\frac{7}{8}$	.90	G64	4	$\frac{1}{16}$	1	1.25	G76	6	$\frac{1}{16}$	1	4.00
G53	$2\frac{1}{2}$	$\frac{3}{32}$	$\frac{7}{8}$	.90	G65	4	$\frac{3}{32}$	1	1.20	G77	6	$\frac{3}{32}$	1	3.00
G54	$2\frac{1}{2}$	$\frac{1}{8}$	$\frac{7}{8}$	.90	G66	4	$\frac{1}{8}$	1	1.20	G78	6	$\frac{1}{8}$	1	2.70
G55	$2\frac{1}{2}$	$\frac{5}{32}$	$\frac{7}{8}$	1.10	G67	4	$\frac{5}{32}$	1	1.40	G79	6	$\frac{5}{32}$	$1\frac{1}{4}$	3.50
G56	3	$\frac{1}{32}$	1	1.25	G68	4	$\frac{1}{16}$	1	1.60	G79A	6	$\frac{3}{16}$	$1\frac{1}{4}$	3.50
G57	3	$\frac{3}{64}$	1	1.10	G69	5	$\frac{1}{16}$	1	1.80	G80	6	$\frac{3}{16}$	1	3.50
G58	3	$\frac{1}{16}$	1	1.00	G70	5	$\frac{3}{32}$	1	1.60	G81	7	$\frac{1}{16}$	1	7.50
G59	3	$\frac{3}{32}$	1	1.00	G71	5	$\frac{1}{8}$	1	1.50	G82	7	$\frac{3}{32}$	1	4.50
G60	3	$\frac{1}{8}$	1	1.00	G72	5	$\frac{1}{4}$	$1\frac{1}{4}$	1.50	G83	7	$\frac{1}{8}$	1	3.80
G61	3	$\frac{5}{32}$	1	1.15	G73	5	$\frac{1}{2}$	$1\frac{1}{2}$	1.50	G84	8	$\frac{1}{8}$	1	5.75

SCREW SLOTTING CUTTERS



FIG. 3380

Number	Thick- ness American Stand- ard Wire Gauge Num- ber	Thick- ness in Diam- eter, Inch	Diam- eter of Cut- ter, Inch	Size of Hole, Inches	Price, Each	Number	Thick- ness American Stand- ard Wire Gauge Num- ber	Thick- ness in Diam- eter, Inch	Diam- eter of Cut- ter, Inch	Size of Hole, Inches	Price, Each
H10	5	.182	$\frac{3}{16}$	1	\$0.70	H36H	17	.045	$\frac{1}{4}$	$\frac{5}{8}$	\$0.15
H11	6	.162	$\frac{5}{16}$	1	.60	H36I	18	.040	$\frac{1}{4}$	$\frac{5}{8}$	.15
H12	7	.144	$\frac{3}{8}$	1	.50	H36J	19	.035	$\frac{1}{4}$	$\frac{5}{8}$	.15
H13	8	.128	$\frac{7}{16}$	$\frac{3}{4}$ 1	.45	H37	20	.032	$\frac{1}{4}$	$\frac{5}{8}$ $\frac{3}{4}$	.15
H14	9	.114	$\frac{1}{2}$	$\frac{3}{4}$ 1	.40	H38	21	.028	$\frac{1}{4}$	$\frac{5}{8}$ $\frac{3}{4}$	.15
H15	10	.102	$\frac{9}{16}$	$\frac{3}{4}$ 1	.35	H39	22	.025	$\frac{1}{4}$	$\frac{5}{8}$ $\frac{3}{4}$	.15
H16	11	.091	$\frac{5}{8}$	$\frac{3}{4}$ 1	.30	H40	23	.023	$\frac{1}{4}$	$\frac{5}{8}$ $\frac{3}{4}$	.15
H17	12	.081	$\frac{3}{4}$	$\frac{3}{4}$ 1	.25	H41	24	.020	$\frac{1}{4}$	$\frac{5}{8}$ $\frac{3}{4}$	.15
H18	13	.072	$\frac{7}{8}$	$\frac{3}{4}$ 1	.20	H42	25	.018	$\frac{1}{4}$	$\frac{5}{8}$ $\frac{3}{4}$	.15
H19	14	.064	$\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$	1	.20	H43	26	.016	$\frac{1}{4}$	$\frac{5}{8}$ $\frac{3}{4}$	.15
H20	15	.057	$\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$	1	.15	H44	27	.014	$\frac{1}{4}$	$\frac{5}{8}$ $\frac{3}{4}$	.15
H21	16	.051	$\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$	1	.15	H45	28	.012	$\frac{1}{4}$	$\frac{5}{8}$ $\frac{3}{4}$	.15
H22	17	.045	$\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$	1	.15	H46	30	.010	$\frac{1}{4}$	$\frac{5}{8}$ $\frac{3}{4}$	.15
H23	18	.040	$\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$	1	.15	H47	32	.008	$\frac{1}{4}$	$\frac{5}{8}$ $\frac{3}{4}$	.15
H24	19	.035	$\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$	1	.15	H48	34	.006	$\frac{1}{4}$	$\frac{5}{8}$ $\frac{3}{4}$	.15
H25	20	.032	$\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$	1	.15	H49	14	.064	$\frac{1}{4}$	$\frac{5}{8}$	.15
H26	21	.028	$\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$	1	.15	H50	15	.057	$\frac{1}{4}$	$\frac{5}{8}$	.15
H27	22	.025	$\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$	1	.15	H51	16	.051	$\frac{1}{4}$	$\frac{5}{8}$	.15
H28	23	.023	$\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$	1	.15	H52	17	.045	$\frac{1}{4}$	$\frac{5}{8}$	.15
H29	24	.020	$\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$	1	.15	H53	18	.040	$\frac{1}{4}$	$\frac{5}{8}$	.15
H30	25	.018	$\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$	1	.15	H54	19	.035	$\frac{1}{4}$	$\frac{5}{8}$	.15
H31	26	.016	$\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$	1	.15	H55	20	.032	$\frac{1}{4}$	$\frac{5}{8}$	.15
H32	27	.014	$\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$	1	.15	H56	21	.028	$\frac{1}{4}$	$\frac{5}{8}$	.15
H33	28	.012	$\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$	1	.15	H57	22	.025	$\frac{1}{4}$	$\frac{5}{8}$	.15
H34	30	.010	$\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$	1	.15	H58	23	.023	$\frac{1}{4}$	$\frac{5}{8}$	.15
H35	32	.008	$\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$	1	.15	H59	24	.020	$\frac{1}{4}$	$\frac{5}{8}$	.12
H36	34	.006	$\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$	1	.15	H60	25	.018	$\frac{1}{4}$	$\frac{5}{8}$	.12
H36A	10	.102	$\frac{9}{16}$	$\frac{3}{4}$ 1	.30	H61	26	.016	$\frac{1}{4}$	$\frac{5}{8}$	.12
H36B	11	.091	$\frac{5}{8}$	$\frac{3}{4}$ 1	.25	H62	27	.014	$\frac{1}{4}$	$\frac{5}{8}$	.12
H36C	12	.081	$\frac{3}{4}$	$\frac{3}{4}$ 1	.20	H63	28	.012	$\frac{1}{4}$	$\frac{5}{8}$	.12
H36D	13	.072	$\frac{7}{8}$	$\frac{3}{4}$ 1	.15	H64	30	.010	$\frac{1}{4}$	$\frac{5}{8}$	.12
H36E	14	.064	$\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$	1	.15	H65	32	.008	$\frac{1}{4}$	$\frac{5}{8}$	.12
H36F	15	.057	$\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$	1	.15	H66	34	.006	$\frac{1}{4}$	$\frac{5}{8}$	.12
H36G	16	.051	$\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$	1	.15						

These cutters have a fine pitch of teeth especially adapted for the slotting of screw heads and similar work. They are not ground on the sides.

Cutters varying from the above list are made to order.

ATKINS CIRCULAR METAL CUTTING SAWS

FOR CUTTING METAL AT SLOW SPEED



FIG. 3381

Dia., Inches	Thick- ness, Inches	Price, Each	Dia., Inches	Thick- ness, Inches	Price, Each	Dia., Inches	Thick- ness, Inches	Price, Each
2 1/2	1/8	\$2.60	7	1/8	\$18.00	14	1/8	\$67.00
2 1/2	1/4	2.70	7	1/4	20.00	14	1/4	74.00
2 1/2	3/8	2.80	7	3/8	22.00	15	1/4	84.00
2 1/2	1/2	3.00	8	1/8	9.75	15	3/8	57.00
2 1/2	3/4	3.40	8	1/4	11.00	15	1/2	68.00
2 1/2	1	3.80	8	3/8	13.50	15	3/4	76.00
2 1/2	1 1/8	4.20	8	1/2	15.50	15	1	96.00
3	1/8	3.00	8	3/4	18.00	15	1 1/4	96.00
3	1/4	3.10	8	1	20.50	16	1/8	67.00
3	3/8	3.25	8	1 1/8	22.50	16	1/4	76.00
3	1/2	3.50	8	1 1/4	25.00	16	3/8	85.00
3	3/4	4.00	8	1 1/2	29.50	16	1/2	94.00
3	1	4.50	9	1	13.25	16	3/4	108.00
3	1 1/8	5.00	9	1 1/8	16.00	17	1/8	75.00
4	1/8	4.00	9	1 1/4	19.00	17	1/4	85.00
4	1/4	4.25	9	1 1/2	22.00	17	3/8	95.00
4	3/8	4.50	9	1 3/4	25.00	17	1/2	105.00
4	1/2	5.00	9	2	28.00	17	3/4	122.00
4	3/4	5.75	9	2 1/8	31.00	18	1/8	83.00
4	1	6.50	9	2 1/4	36.00	18	1/4	94.00
4	1 1/8	7.00	10	2 1/2	35.50	18	3/8	105.00
4	3/4	7.50	10	2 3/4	38.50	18	1/2	116.00
4	1 1/4	8.50	10	3	42.50	18	3/4	138.00
5	1/8	5.00	10	3 1/8	46.50	19	1/8	92.00
5	1/4	5.25	10	3 1/4	50.00	19	1/4	105.00
5	3/8	5.75	10	3 1/2	53.00	19	3/8	117.00
5	1/2	6.50	10	3 3/4	56.00	19	1/2	130.00
5	3/4	7.50	10	4	62.00	19	3/4	154.00
5	1	8.50	11	4 1/8	66.00	20	1/8	101.00
5	1 1/8	9.50	11	4 1/4	70.00	20	1/4	115.00
5	3/4	10.50	11	4 1/2	74.00	20	3/8	128.00
5	1 1/4	11.50	11	4 3/4	78.00	20	1/2	142.00
5	1 1/2	13.50	11	5	84.00	20	3/4	170.00
6	1/8	6.00	12	5 1/8	90.00	21	1/8	126.00
6	1/4	6.50	12	5 1/4	96.00	21	1/4	140.00
6	3/8	7.25	12	5 1/2	102.00	21	3/8	156.00
6	1/2	8.50	12	5 3/4	108.00	21	1/2	170.00
6	3/4	10.00	12	6	114.00	21	3/4	190.00
6	1	11.50	12	6 1/8	120.00	22	1/8	137.00
6	1 1/8	13.00	12	6 1/4	126.00	22	1/4	152.00
6	3/4	14.25	13	6 1/2	132.00	22	3/8	170.00
6	1 1/4	15.50	13	6 3/4	138.00	22	1/2	205.00
6	1 1/2	18.00	13	7	144.00	23	1/8	149.00
7	1/8	8.00	13	7 1/8	150.00	23	1/4	166.00
7	1/4	9.50	13	7 1/4	156.00	23	3/8	185.00
7	3/8	11.00	13	7 1/2	162.00	23	1/2	222.00
7	1/2	13.00	14	7 3/4	172.00	24	1/8	161.00
7	3/4	15.00	14	8	182.00	24	1/4	179.00
7	1	16.50	14	8 1/8	192.00	24	3/8	200.00
					200.00	24	1/2	240.00

ATKINS METAL CUTTING SAWS



FIG. 3382

FOR CUTTING HOT METALS AT HIGH SPEED

Diam., Inches	Thickness of Plate, Gage	Price Each	Each Gage Heavier, Add	Diam., Inches	Thickness of Plate, Inch	Price Each	Each Inch Heavier, Add
14	10	\$4.50	\$0.25	36	$\frac{3}{16}$	\$37.00	\$2.30
16	10	5.00	.30	38	$\frac{3}{16}$	42.00	2.55
18	9	6.50	.35	40	$\frac{1}{4}$	49.00	2.85
20	8	8.00	.40	42	$\frac{1}{4}$	53.00	3.15
22	7	10.00	.50	44	$\frac{1}{4}$	56.00	3.45
24	6	12.00	.60	46	$\frac{1}{4}$	60.00	3.75
26	6	14.00	.75	48	$\frac{1}{4}$	64.00	4.10
28	5	16.00	.95	50	$\frac{1}{8}$	77.00	4.45
30	5	19.00	1.10	52	$\frac{1}{8}$	84.00	4.80
32	5	22.00	1.25	54	$\frac{1}{8}$	90.00	5.15
34	5	25.00	1.40	56	$\frac{3}{8}$	106.00	5.55
.....	.....	.....	.....	58	$\frac{3}{8}$	113.00	5.95
.....	.....	.....	.....	60	$\frac{3}{8}$	121.00	6.40

FRICTION DISCS (WITHOUT TEETH)

FOR CUTTING COLD METAL AT HIGH SPEED

Diam., Inches	Thick- ness of Plate, Gage	Price Each	Each Gage Heavier, Add	Net Price Each, Nickel Edge	Diam., Inches	Thick- ness of Plate, Inches	Price Each	Each Inch Heavier, Add	Net Price Each, Nickel Edge
14	10	\$4.05	\$0.25	\$0.40	36	$\frac{1}{4}$	\$30.00	\$1.90	\$0.95
16	10	4.50	.30	.45	38	$\frac{1}{4}$	32.00	2.15	1.00
18	9	5.85	.35	.50	40	$\frac{1}{4}$	35.00	2.40	1.05
20	8	7.20	.40	.55	42	$\frac{1}{4}$	37.00	2.60	1.10
22	7	9.00	.50	.60	44	$\frac{1}{4}$	40.00	2.85	1.20
24	6	10.80	.60	.65	46	$\frac{1}{4}$	43.00	3.15	1.25
26	6	12.60	.75	.70	48	$\frac{1}{4}$	46.00	3.45	1.30
28	5	14.40	.95	.75	50	$\frac{1}{8}$	57.00	3.70	1.35
30	5	17.10	1.10	.80	52	$\frac{1}{8}$	63.00	4.00	1.45
32	5	19.80	1.25	.85	54	$\frac{1}{8}$	68.00	4.30	1.55
34	5	22.50	1.40	.90	56	$\frac{3}{8}$	82.00	4.60	1.65
.....	.....	.....	.....	.....	58	$\frac{3}{8}$	88.00	4.95	1.80
.....	.....	.....	.....	.....	60	$\frac{3}{8}$	95.00	5.30	1.95

LATHE DOGS

Heavy Steel Dog



FIG. 3383

Light Steel Dog



FIG. 3384

HEAVY STEEL DOG

With U. S. Standard Hard Point Steel Screws.

Number	Size, Inches	Price Each	Extra Screws, Each	Number	Size, Inches	Price Each	Extra Screws, Each
1	$\frac{3}{8}$	\$0.40	\$0.13	15	3	\$1.60	\$0.53
2	$\frac{1}{2}$	.50	.17	16	$3\frac{1}{2}$	1.80	.60
3	$\frac{5}{8}$	.60	.20	17	4	2.10	.70
4	$\frac{3}{4}$	.60	.20	18	$4\frac{1}{2}$	2.75	.92
5	$\frac{7}{8}$	.70	.23	19	5	3.25	1.08
6	1	.70	.23				Price
7	$1\frac{1}{8}$	.80	.27	Full set of 19.....			\$23.60
8	$1\frac{1}{4}$	.80	.27	20 (extra) $5\frac{1}{2}$ inches.....			4.00
9	$1\frac{3}{8}$	.95	.32	21 (extra) 6 inches.....			5.00
10	$1\frac{1}{2}$	.95	.32	One small set of 8, by $\frac{1}{4}$ inch to			
11	$1\frac{3}{4}$	1.10	.37	2 inches			6.25
12	2	1.20	.40	One set of 12, by $\frac{1}{4}$ in. to 2 in.,			
13	$2\frac{1}{4}$	1.33	.45	continued by $\frac{1}{2}$ in. to 4 in.....			15.20
14	$2\frac{1}{2}$	1.45	.48				

This Dog has a very heavy boss, so that if the thread wears a heavier screw can be substituted.

When ordering, state as above whether a full set, or a set of 12, or small set of 8 is wanted.

LIGHT STEEL DOG

With Hardened Steel Screws Turned in Lathe

Number	Size, Inches	Price Each	Extra Screws Each	Number	Size, Inches	Price Each	Extra Screws Each	Number	Size, Inches	Price Each	Extra Screws Each
1	$\frac{3}{8}$	\$0.35	\$0.12	5	$1\frac{1}{4}$	\$0.75	\$0.25	9	$2\frac{1}{2}$	\$1.40	\$0.47
2	$\frac{1}{2}$	.35	.12	6	$1\frac{1}{2}$	.85	.28	10	3	1.50	.50
3	$\frac{3}{4}$	.50	.17	7	$1\frac{3}{4}$	1.00	.33	11	$3\frac{1}{2}$	1.70	.57
4	1	.60	.20	8	2	1.10	.37	12	4	1.90	.63

"VULCAN" DROP FORGED LATHE DOGSNos. 1 to 13
Old Style Safety ScrewNos. 21. to 33
Old Style Safety Screw

FIG. 3385



FIG. 3386



FIG. 3387



FIG. 3388

Safety Dog Wrench

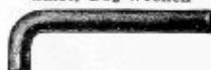


FIG. 3389

Safety Screw



FIG. 3390

Safety for the operator and better balance when on the lathe are material improvements which have been attained by modification of design.

Unless otherwise specified, dogs with square head screws will be supplied.

Bent Tail, No.	Straight Tail, Number	Capacity	Screws						Price	
			Square Head			Safety			Safety Dog Wrench, Extra	Dog With Either Screw
			Size		Price, Each	Size		Price, Each		
			Diam.	Len'th		Diam.	Len'th			
1	21	$\frac{3}{8}$	$\frac{5}{16}$	$1\frac{1}{4}$	\$0.08	$\frac{7}{16}$	$\frac{5}{8}$	\$0.10	\$0.06	\$0.50
2	22	$\frac{3}{8}$	$\frac{3}{8}$	$1\frac{3}{4}$	.10	$\frac{9}{16}$	$1\frac{1}{2}$	.12	.07	.55
3	23	$\frac{3}{8}$	$\frac{3}{8}$	$1\frac{3}{4}$	.12	$\frac{5}{8}$	$1\frac{1}{2}$	.15	.08	.60
4	24	1	$\frac{1}{2}$	2	.15	$1\frac{1}{16}$	$1\frac{1}{4}$	.18	.08	.70
5	25	$1\frac{1}{4}$	$\frac{1}{2}$	$2\frac{1}{4}$	.16	$\frac{3}{4}$	$1\frac{3}{8}$	.21	.10	.85
6	26	$1\frac{3}{8}$	$\frac{9}{16}$	$2\frac{3}{8}$	.18	$1\frac{1}{16}$	$1\frac{3}{8}$	.25	.12	1.00
7	27	$1\frac{3}{4}$	$\frac{5}{8}$	$2\frac{1}{2}$	.20	$\frac{7}{8}$	$1\frac{3}{4}$	.30	.12	1.20
8	28	2	$1\frac{1}{16}$	$2\frac{3}{4}$	.23	1	$1\frac{7}{8}$	.36	.15	1.40
9	29	$2\frac{1}{2}$	$1\frac{1}{16}$	3	.24	$1\frac{1}{8}$	2	.43	.19	1.80
10	30	3	$\frac{3}{4}$	$3\frac{1}{4}$	.27	$1\frac{1}{4}$	$2\frac{1}{8}$	.52	.24	2.30
11	31	$3\frac{1}{2}$	$\frac{7}{8}$	$3\frac{1}{2}$	.32	$1\frac{3}{8}$	$2\frac{1}{2}$	.63	.30	3.00
12	32	4	$\frac{7}{8}$	$3\frac{3}{4}$	.35	$1\frac{1}{2}$	$2\frac{3}{4}$	.75	.37	4.50
13	33	5	1	$4\frac{1}{2}$	.50	$1\frac{5}{8}$	$3\frac{1}{8}$	.90	.45	8.00

"VULCAN" MILLING MACHINE DOGS

Designed with flat tail to prevent back-lash in taper work.



FIG. 3391

No.	Capacity	Price	
		Extra Screws	Complete Dog
42	$\frac{1}{2}$	\$0.10	\$0.55
43	$\frac{3}{4}$	.12	.60
44	1	.15	.70
45	$1\frac{1}{4}$	.16	.85
46	$1\frac{1}{2}$	.18	1.00
47	$1\frac{3}{4}$	.20	1.20
48	2	.23	1.40

"VULCAN" DROP FORGED LATHE DOGS

Nos. 12A to 14A

Old Style



FIG. 3392

Safety Screw



FIG. 3393

Nos. 32A to 34A

Old Style



FIG. 3394

Safety Screw



FIG. 3395

Safety Dog Wrench



FIG. 3396

Safety Screw



FIG. 3397

Safety for the operator and better balance when on the lathe are material improvements which have been attained by modification of design.

Unless otherwise specified, dogs with square head screws will be supplied.

Bent Tail, Number	Straight Tail, Number	Capacity	Screws							Price	
			Square Head			Safety				Safety Dog Wrench, Extra	Dog With Either Screw
			Size		Price, Each	Size		Price, Each			
			Diam.	Length		Diam.	Length				
12A	32A	4	$\frac{7}{8}$	$3\frac{3}{4}$	\$0.35	$1\frac{1}{2}$	$2\frac{3}{4}$	\$0.75	\$0.37	\$ 8.00	
13A	33A	5	1	$4\frac{1}{2}$	.50	$1\frac{5}{8}$	$3\frac{1}{8}$	.90	.45	12.00	
14A	34A	6	1	$4\frac{1}{2}$	.50	$1\frac{3}{4}$	$3\frac{1}{2}$	1.15	.55	17.00	



FIG. 3398

VULCAN CLAMP LATHE DOGS

No.	Distance Between Screws	Capacity Between Clamps	Screws		Price, Complete Dog
			Diameter	Length	
61	$1\frac{3}{4}$	$1\frac{1}{2}$	$\frac{5}{16}$	$2\frac{3}{4}$	\$1.50
62	$2\frac{1}{4}$	$1\frac{1}{2}$	$\frac{3}{8}$	$3\frac{5}{16}$	2.00
63	$2\frac{3}{4}$	$2\frac{1}{2}$	$\frac{7}{16}$	$4\frac{9}{32}$	2.50
64	$3\frac{1}{2}$	$3\frac{1}{4}$	$\frac{1}{2}$	$5\frac{1}{8}$	3.50

BONNEY INDISPENSABLE LATHE DOGS



FIG. 3399

Indispensable Lathe Dogs are made of semi-steel castings and are carefully assembled to a close and accurate fit. The bosses are sufficiently large to allow retapping should this be necessary. The screws have U. S. Standard threads and dog points. They are carefully hardened to prevent wear.

One of the advantages of Indispensable Lathe Dogs is that a set of three will do all the work of sixteen Heavy Steel Dogs. This means a great saving as the mechanic need not spend his time looking for the proper size for his work.

Another advantage is that Indispensable Lathe Dogs can be attached to the work after it is centered on the lathe. This means a great saving in time on delicate work.

Indispensable Lathe Dogs are warranted against breakage or against defects of material or workmanship.

No.	Description	Capacity	Price Each
0	For jewelers and tool makers	$\frac{1}{4}$ in. to $\frac{3}{4}$ in.	\$1.00
1	For general lathe work	$\frac{1}{4}$ in. to $1\frac{1}{4}$ in.	1.50
2	For general lathe work	$\frac{1}{2}$ in. to $2\frac{1}{4}$ in.	2.50
3	For general lathe work	1 in. to $3\frac{1}{4}$ in.	3.50

Price per set of three, one each from No. 1 to No. 3, capacity $\frac{1}{4}$ in. to $3\frac{1}{4}$ in. \$7.50

WILLIAMS' "LIGHT SERVICE" DROP-FORGED
"C" CLAMPS

In respective order, as per table, the minimum capacities of Clamps are as follows: 0, 0, 0, $\frac{5}{8}$, 1, 2, 3, 4 inches.



No.	Capacity	Depth Throat from Center of Screw	Extreme Dimensions		Screw		Ap- proximate Wgt. Each Lbs.	PRICE	
			L'gth	W'dth	Dia.	L'gth Over All		Screw, H'dle and Swivel	Clamps Com- plete
402	2	1 $\frac{3}{4}$	4 $\frac{3}{8}$	3 $\frac{3}{8}$	1 $\frac{1}{2}$	4 $\frac{3}{8}$	3 $\frac{1}{4}$	\$0.30	\$0.75
403	3	2	5 $\frac{3}{8}$	3 $\frac{3}{8}$	1 $\frac{1}{2}$	5 $\frac{3}{8}$	1 $\frac{1}{4}$	.35	.90
404	4	2 $\frac{3}{8}$	6 $\frac{1}{8}$	4 $\frac{3}{8}$	1 $\frac{1}{2}$	7 $\frac{1}{8}$	2	.40	1.10
*444	4	1 $\frac{1}{2}$	6 $\frac{3}{4}$	3 $\frac{3}{8}$	1 $\frac{1}{2}$	6 $\frac{3}{8}$	1 $\frac{3}{4}$	.40	1.10
406	6	3	9 $\frac{1}{8}$	5 $\frac{1}{4}$	1 $\frac{1}{2}$	8 $\frac{3}{8}$	3	.50	1.50
408	8	3 $\frac{3}{8}$	11 $\frac{1}{8}$	5 $\frac{7}{8}$	1 $\frac{3}{4}$	10	4 $\frac{1}{2}$	.60	2.00
410	10	3 $\frac{3}{4}$	14 $\frac{1}{8}$	6 $\frac{7}{8}$	1 $\frac{3}{4}$	11 $\frac{1}{8}$	6	.75	2.50
412	12	4	16 $\frac{1}{8}$	6 $\frac{7}{8}$	1 $\frac{3}{4}$	12 $\frac{1}{8}$	7 $\frac{1}{2}$	1.00	3.25

*Special Clamp, differing only in depth of throat dimension, sectional form and style of Screw.

WILLIAMS' "VULCAN"
DROP-FORGED TOOL MAKERS' "C" CLAMPS

Black, are oil treated only.

Bright, surfaces and edges of clamp all ground, panel black,—see illustration.

Unless otherwise specified, Bright Clamps with Swivel Screw will be furnished. Packed singly in boxes or in sets if specified.

WITH PLAIN SCREW



Number	Capacity	Depth of Throat	Extreme Dimensions Clamp		Screw, Plain		PRICE		
			Length	Width	Dis.	Length	Extra Screw, Plain	CLAMP COMPLETE Black	Bright
201	1	$\frac{11}{16}$	$2\frac{1}{8}$	$1\frac{1}{2}$	$\frac{5}{16}$	$1\frac{1}{2}$	\$0.20	\$0.50	\$0.65
202	2	$\frac{11}{16}$	$3\frac{3}{16}$	$1\frac{7}{8}$	$\frac{3}{8}$	$2\frac{7}{8}$	.25	.65	.80
203	3	$\frac{5}{8}$	$4\frac{1}{2}$	$2\frac{1}{8}$	$\frac{3}{8}$	$3\frac{3}{8}$	.30	.85	1.05
204	4	$1\frac{1}{8}$	$6\frac{3}{8}$	$2\frac{1}{2}$	$\frac{7}{8}$	$4\frac{1}{8}$	.40	1.25	1.50
Per Set			(Bright Clamps, in specially prepared Box, without extra charge)					3.25	4.00

WITH REMOVABLE-SWIVEL SCREW

Number	Capacity	Depth of Throat	Extreme Dimensions Clamp		Screw, with Swivel		PRICE		
			Length	Width	Dia.	Length	Extra Screw with Swivel	CLAMP COMPLETE	
								Black	Bright
201	1	$\frac{5}{8}$	$2\frac{1}{8}$	$1\frac{1}{2}$	$\frac{5}{8}$	$1\frac{13}{16}$	\$.45	\$0.75	\$0.90
202	2	$\frac{5}{8}$	$3\frac{5}{8}$	$1\frac{7}{8}$	$\frac{3}{8}$	$2\frac{1}{2}$	.50	.90	1.05
203	3	$\frac{5}{8}$	$4\frac{1}{2}$	$2\frac{1}{8}$	$\frac{3}{8}$	$3\frac{3}{8}$	.60	1.15	1.35
204	4	$1\frac{1}{8}$	$6\frac{3}{8}$	$2\frac{1}{2}$	$\frac{3}{8}$	$4\frac{1}{8}$	.75	1.60	1.85
Per Set			(Bright Clamps, in specially prepared Box, without extra charge.)					4.40	5.15



FIG. 3402

"VULCAN" DROP-FORGED HEAVY SERVICE "C" CLAMPS

The screws, threaded U. S. Standard, are made of a special grade of steel, well adapted to the purpose and are hardened and tempered; given lengths are under-head dimensions.

In respective order as per table the minimum capacities of Clamps are approximately as follows: $\frac{1}{8}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, $1\frac{1}{2}$, 2, $2\frac{1}{2}$, $3\frac{1}{2}$, $4\frac{1}{4}$, $6\frac{3}{8}$, $7\frac{3}{8}$.

For convenience of dealers, each Clamp up to No. 8 size, is packed in a box.

No.	Capacity	Depth of Throat from Center of Screw	Extreme Dimensions of Body		Screw		Approximate Weight Each, Lbs.	PRICE	
			Length	Width	Diameter	Length Under Head		Extra Screws Each	Clamps Complete
0	$\frac{3}{4}$	$\frac{3}{4}$	$2\frac{3}{8}$	$1\frac{1}{2}$	$\frac{5}{8}$	$1\frac{1}{4}$	$\frac{1}{4}$	\$0.08	\$ 0.50
1	$1\frac{1}{4}$	$1\frac{1}{8}$	$3\frac{1}{4}$	$2\frac{3}{4}$	$\frac{3}{8}$	$1\frac{3}{4}$	$\frac{3}{4}$	.11	.75
$1\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{1}{2}$	$4\frac{1}{4}$	$3\frac{3}{8}$	$\frac{1}{2}$	$2\frac{1}{4}$	$1\frac{1}{2}$	.14	1.25
2	$2\frac{1}{4}$	$1\frac{3}{4}$	$5\frac{1}{2}$	$4\frac{1}{2}$	$\frac{5}{8}$	$2\frac{3}{8}$	$3\frac{1}{2}$	.20	1.75
3	$3\frac{1}{4}$	$2\frac{3}{8}$	$7\frac{1}{4}$	$5\frac{3}{4}$	$\frac{3}{4}$	$3\frac{3}{4}$	$6\frac{1}{2}$	.28	2.50
4	$4\frac{1}{2}$	$2\frac{3}{4}$	$8\frac{7}{8}$	$6\frac{1}{2}$	$\frac{7}{8}$	$4\frac{1}{2}$	$9\frac{5}{8}$	.38	3.25
5	$5\frac{1}{2}$	$3\frac{1}{8}$	$10\frac{3}{8}$	7	$\frac{7}{8}$	$5\frac{3}{8}$	$12\frac{1}{4}$	.50	4.00
6	$6\frac{1}{2}$	$3\frac{3}{8}$	12	$7\frac{7}{8}$	1	$5\frac{7}{8}$	$16\frac{1}{2}$	.65	5.00
8	$8\frac{1}{2}$	$3\frac{3}{4}$	$14\frac{3}{8}$	$8\frac{1}{2}$	$1\frac{1}{8}$	7	24	.85	7.00
$10\frac{1}{2}$	$10\frac{1}{2}$	$4\frac{1}{8}$	$16\frac{7}{8}$	$9\frac{1}{8}$	$1\frac{1}{8}$	7	28	.85	9.50
$12\frac{1}{2}$	$12\frac{1}{2}$	$4\frac{1}{2}$	$19\frac{3}{8}$	$9\frac{3}{4}$	$1\frac{1}{4}$	8	40	1.20	12.50

Extra length screws, supplied to order, at an extra charge.

"VULCAN" DROP-FORGED STRAP CLAMP



FIG. 3403

Because of draft or taper on forgings, [minimum dimensions of slot are given in table.

PLAIN SLOT PATTERN

No.	Lengths	Width		Thickness		Slot Min. Dimensions		Price Each
		Ends	Center	Ends	Center	Length	Width	
54	4	$1\frac{3}{8}$	$1\frac{5}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$1\frac{3}{8}$	$\frac{1}{8}$	\$0.30
56	6	$1\frac{1}{4}$	$1\frac{3}{4}$	$\frac{3}{8}$	$\frac{7}{8}$	$2\frac{1}{8}$	$\frac{1}{8}$	.50
58	8	$1\frac{1}{2}$	$2\frac{1}{8}$	$\frac{3}{4}$	$1\frac{1}{8}$	$2\frac{3}{8}$	$\frac{1}{8}$	.85
59	10	$1\frac{3}{4}$	$2\frac{1}{2}$	$1\frac{1}{8}$	$1\frac{3}{8}$	$3\frac{1}{8}$	$\frac{1}{8}$	1.40

MECHANICS' STEEL CLAMPS

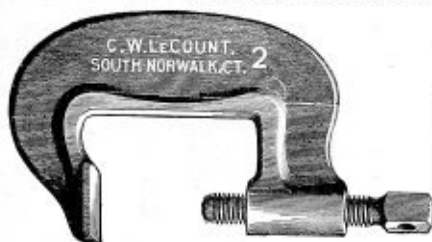


FIG. 3404

For boilermakers, blacksmiths, machinists, etc.

Back is $1\frac{1}{2}$ inches from center of screw.

Number	1	2	3	4
Opens	2	3	4	5
Each	\$1.25	1.50	1.75	2.00

Number	5	6	7	8
Opens	6	7	8	9
Each	\$2.25	2.50	2.75	3.00

Full set\$17.00

HEAVY STEEL CLAMPS

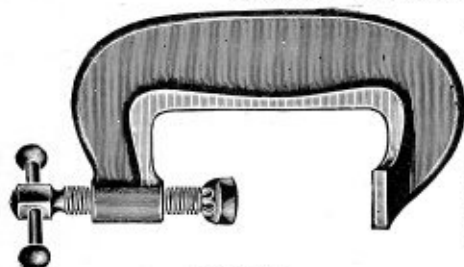


FIG. 3405

Back is $2\frac{1}{2}$ inches from center of screw.

Screws are made to reach next lower number

No. 1 opening to 2 inches...	each, \$1.75
No. 2 opening to 3 inches...	each, 2.00
No. 3 opening to 4 inches...	each, 2.25
No. 4 opening to 5 inches...	each, 2.50
No. 5 opening to 6 inches...	each, 2.75
No. 6 opening to 8 inches...	each, 3.25
No. 7 opening to 10 inches...	each, 3.75
No. 8 opening to 12 inches...	each, 4.25
No. 9 opening to 14 inches...	each, 5.00
No. 10 opening to 16 inches...	each, 6.00
No. 11 opening to 18 inches...	each, 7.00

Full set, 11 sizes.....\$40.50

LIGHT STEEL BOILER CLAMP

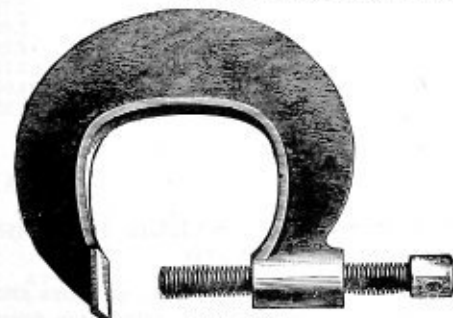


FIG. 3406

Sufficiently heavy for most uses.

No. 0 opens $2\frac{1}{2}$ inches runs back	
$2\frac{1}{2}$ inches	each, \$2.00
No. 1 opens 4 inches, runs back	
$4\frac{1}{2}$ inches	each, 4.00

EXTRA HEAVY STEEL BRIDGE CLAMP

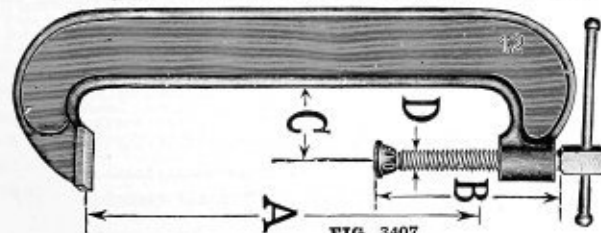


FIG. 3407

Screws are made to reach the next lower number.

The screw is heavy and has button on the end.

No. 12 opens 24 inches	each, \$12.00
No. 13 opens 30 inches	each, 16.00

HEAVY DROP-FORGED "C" CLAMP

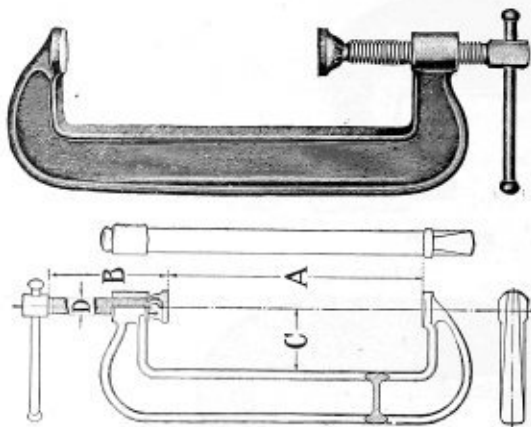


FIG. 3408

Screw is made from high-grade steel carefully threaded with U. S. S. thread hardened and tempered.

No.	A Inches	B Inches	C Inches	D Inches	Approximate Weight Each, Lbs.	List
2	3	5 $\frac{3}{4}$	3	1 $\frac{1}{2}$	6 $\frac{1}{2}$	\$2.50
3	4	5 $\frac{3}{4}$	3	1 $\frac{1}{2}$	7	2.75
4	5	5 $\frac{3}{4}$	3	1 $\frac{1}{2}$	7 $\frac{1}{2}$	3.00
5	6	5 $\frac{3}{4}$	3	1 $\frac{1}{2}$	8	3.25
6	8	5 $\frac{3}{4}$	3	1 $\frac{1}{2}$	8 $\frac{3}{4}$	3.75
7	10	5 $\frac{3}{4}$	3	1 $\frac{1}{2}$	9 $\frac{3}{4}$	4.00
8	12	5 $\frac{3}{4}$	3	1 $\frac{1}{2}$	10 $\frac{3}{4}$	4.25

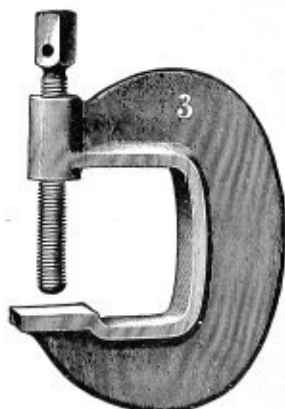


FIG. 3409

EXTRA HEAVY STEEL BOILER CLAMP

The screws have square threads, are large and well fitted. Sizes No. 2, 3, 4, 5, screws run down to foot. No. 6 screw, 2 in. of the foot. No. 7 screw 4 in. of the foot. All screws are hardened on the point.

No. 2	opens 3 inches.	\$ 4.00
" 3	" 4 "	5.00
" 4	" 5 "	6.00
" 5	" 6 "	7.50
" 6	" 8 "	8.50
" 7	" 10 "	10.00

CRANE'S NEW MODEL WHEEL AND GEAR PULLER

For removing Fly Wheels, Auto Wheels, Transmission and Cam Shaft Gears, Sprockets, Collars, Couplings, Commutators, Propellers, etc., bending pipe, straightening shafts, and removing universal joints.

The screw has a flat end with an inserted tempered tool steel point. It will not spread centers; will make its own center on work that has none. The strain is taken up on the flat end of the screw, and the tendency of a Puller to tip to one side under a heavy strain is overcome.

The point should be greased to keep it from cutting.

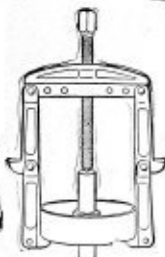
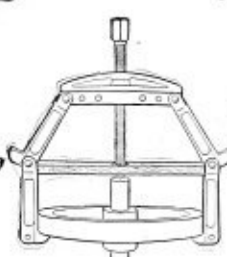


FIG. 3410

The Screws are made of high carbon steel and case-hardened all over.

Pullers are regularly furnished with two sets of our new combination hook and extension arm unless otherwise ordered.

The No. 2 Arms are 6 inches from center to center of holes. The No. 3 Arms are 7 inches from center to center. The No. 2 Puller will reach work 11 inches from end of shaft, and takes work 20 inches in diameter. The No. 3 Puller will reach work 13 inches from end of shaft, and 26 inches in diameter.

Removing Work
Near End of ShaftWork Beyond Reach
of one Set of ArmsWork of Large Diameter
(a piece of wood being used
as a spread)

Three-Arm Puller

Pipe Bending and Shaft
Straightening Attachment

NEW FEATURES

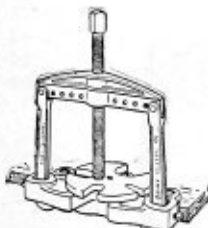
A base to bolt to the bench, making a fine screw arbor press, can be furnished for the No. 2 and No. 3 Pullers in the Two-Arm style.

A pipe bending attachment that is a great convenience for bending Exhaust Pipes, straightening Transmission and Propeller Shafts and removing Universal Joints can be furnished for the No. 2 and No. 3 Pullers in the Two-Arm style.

An extra size BEAM, 19 inches long, can be furnished for the No. 3 Two-Arm Puller.

A patent Locking Arm having set-screws that hold the arm on the work and a Combination Arm with a thin jaw to get hold of Gears, etc., that are close to the case, are attachments that the busy garage man will appreciate.

A 9 inch Arm can be furnished for the No. 2 Puller, a 10 inch Hook Arm and a 10 inch Extension for the No. 3 Puller.



Arbor Press Base



Locking Arm.

PRICES—No. 2 PULLER

2 arm with 2 sets combination arms, 17 lbs.	\$8.00
3 arm with 2 sets combination arms, 21 "	10.50
Pipe Bending Attachment, 6 "	2.75
Arbor Press Base, 13 "	5.50
2 Arm Beam, 4 "	2.56
3 Arm Beam, 5 "	3.34
Screw, 1 "	2.00
Combination Arms, each, 2 "	.80
Thin Jaw Arms, each, 1 "	.80
9 inch Arms, each, 2 "	1.00
Kohler Locking Arms, each, 2 "	.06
Pins, 2 "	

PRICES—No. 3 PULLER

2 arm with 2 sets Combination Arms, 28 lbs.,	\$10.00
3 arm with 2 sets Combination Arms, 41 "	13.00
Pipe Bending Attachment, 9 "	3.50
Arbor Press Base, 31 "	7.50
2 Arm Beam, 7 "	3.56
3 Arm Beam, 10 "	4.44
No. 3 Extra Long Beam, 13 "	5.56
Screw, 5 "	2.20
Combination Arms, each, 2 "	1.00
Thin Jaw Arms, each, 3 "	1.00
10 inch Arms, each, 3 "	1.00
Extension Arms, each, 3 "	1.00
Kohler Locking Arms, each, 3 "	1.25
Pins, 3 "	.06

We Absolutely Guarantee the Workmanship and Materials in these Tools

GREENERD ARBOR PRESSES

No. 3



FIG. 3411

No. 3½ on Post

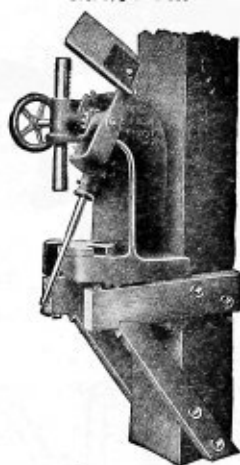


FIG. 3412

No. 4

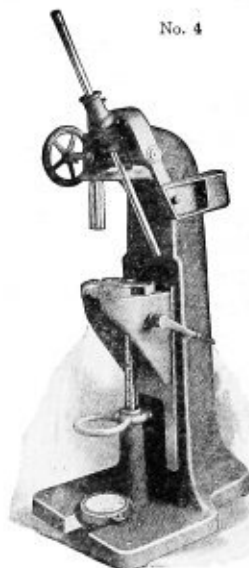


FIG. 3413

No. 17

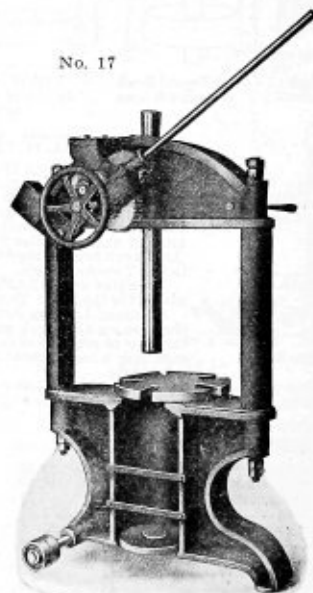


FIG. 3414

See following page for lists.

GREENERD ARBOR PRESSES—CONTINUED

These presses are used for forcing arbors (mandrels) into and out of work.

Saves time and finished work.

Saves springing and battering the arbor and work.

Saves splitting the work and chipping the end of the arbor which comes from the usual method of driving the arbor by means of a hammer or sledge.

Saves cleaning out the centers and taking off the lathe dog when changing pieces.

The sound from striking an arbor (or mandrel) is the protest which is sent out against such use.

Hundreds of these presses are being used for purposes other than pressing arbors, such as broaching, punching, bending with dies, and many other uses.

No. 3 Press shows press on stand. Stand may be omitted and press placed on end of lathe bed or bench, if desired.

No. 3½ Press shows same attached to post. Floor space must be economized in some shops, and the press may be placed out of the way as shown.

No. 4 Press has an adjustable knee tongued into the planed surface onto the frame, and is adjustable by means of a screw.

No. 5 Press, like the No. 4, has an adjustable knee, having a movement of 14 inches, a rabbitted recess in the base to protect the arbor and retaining ring to prevent the arbor from falling lengthwise and being injured.

HOW TO OBTAIN PRESSURE EXERTED FROM THE LEVERAGE GIVEN

Multiply the power exerted upon the end of the lever by the leverage, and subtract 10% for friction. Thus a No. 3 Press, 100 pounds upon the lever end X leverage 45—10%=100×45=4500—10%=4050 pounds power exerted. No. 5 Press, 100 pounds upon the end of the lever end X leverage 150—10%=100×150=15,000—10%=13,500 pounds exerted. The leverages given are not estimates which are fictitious, but can be easily proven to be the exact leverages.

PRICES GREENERD ARBOR PRESSES

No.	Receives Diameters	Largest Mandrel	Height Over Plate	Size of Rack or Ram	Movement of Rack or Ram	Leverage	Height	Weight	Net Prices Presses	Weight Stands Lbs.	Net Prices Stands
1	5¼	¾	4	7x7½	4¾	25-1	8	17	.....	...	.....
2	8	1	7¼	12x1½	8	35-1	14	65	.....	200	.....
3	12	1½	11	17x1¾	11¼	45-1	17	125	.....	250	.....
3-A	24	1½	11	17x1¾	11¼	45-1	24	245	.....	300	.....
3JBS	12	1½	14	17x1¾	11¼	45-1	20	185	.....	.....	.....
3½	19	3	15	19x2½	14	55-1	28	400	.....	300	.....
3¾	22	3	20½	24x2½	19	55-1	36	480	.....	300	.....
4	18	3	30	22x2½	16¾	60-1	60	1,000	.....	.....	.....
5	26	4	31	24x2½	15½	150-1	66	1,550	.....	.....	.....
7	36	5	34	32x3½	20	250-1	75	2,550	.....	.....	.....
8	36	7	35	56x4x4	35	250-1	76	2,450	.....	.....	.....
9	48	7	35	56x4x4	35	250-1	78	2,800	.....	.....	.....
13	30	1½	11	17x1¾	12¼	45-1	55	435	.....	.....	.....
14	36	3	27	34x2½	25¾	60-1	65	1,175	.....	.....	.....
15	36	4	27	34x2½	25¾	150-1	66	1,300	.....	.....	.....
17	36	4	28	40x3½	29	250-1	70	2,000	.....	.....	.....

THE CALDWELL HYDRAULIC WHEEL PRESSES

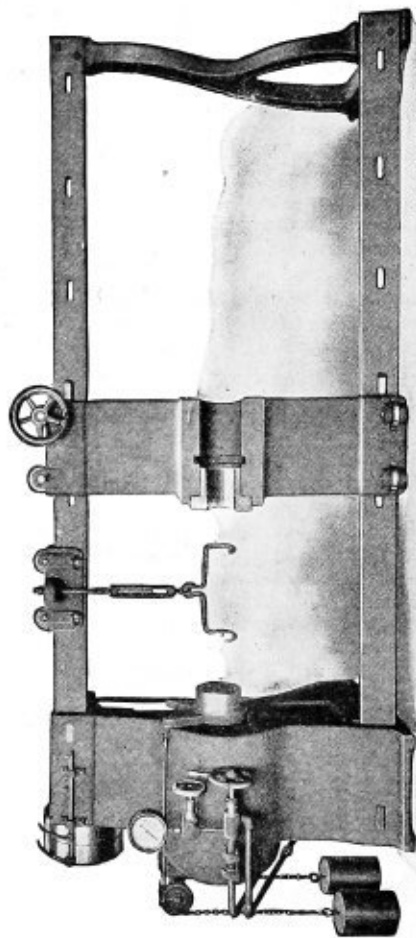


FIG. 3415

The best material to be obtained is used throughout, and all parts are of ample strength to withstand a 25 per cent. overload. Every press is tested to a pressure of 10 per cent. above the rated capacity. The steel parallel bars are of sufficient size to insure absolute safety against breakage. Cut gears are used, operating the plungers without vibration, and being practically noiseless. The rams are faced with hardened steel, and steel shoes are furnished for the face of sliding heads. The cylinders are cast from a special Semi-Steel mixture, giving them great strength and making them proof against leakage.

For sizes, etc., see following page.

THE CALDWELL HYDRAULIC WHEEL PRESSES—CONTINUED

DIMENSIONS

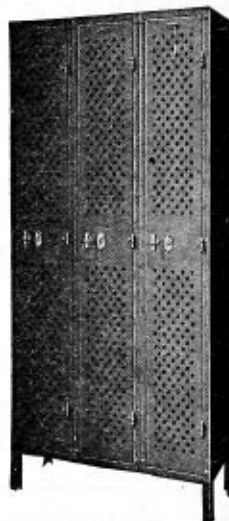
Number of Press	Size Inches	Capacity Tons	Distance Between Parallel Bars Inches	Extreme Distance Between Ram and Head Block Feet	Diameter of Ram Inches	Travel of Ram Inches	Maximum Working Pressure per Square Inch Pounds	Steel Piston Rod Bars Inches	Tight and Loose Pulleys Inches	Speed of Pulleys	Weight Pounds
1	33	50	33	8 $\frac{1}{2}$	6 $\frac{1}{2}$	15	3000	1 $\frac{1}{2}$ x5	3 $\frac{1}{2}$ x24	125	4000
2	33	100	33	8 $\frac{1}{2}$	9 $\frac{1}{2}$	15	3000	1 $\frac{1}{2}$ x5	3 $\frac{1}{2}$ x24	125	4500
3	38	150	38	8 $\frac{1}{2}$	9 $\frac{1}{2}$	18	5000	2x6	4x18	400	7500
4	38	200	38	8 $\frac{1}{2}$	10 $\frac{1}{2}$	18	5000	2 $\frac{1}{4}$ x7	4x18	400	9500
5	38	250	38	8 $\frac{1}{2}$	11 $\frac{1}{2}$	18	5000	2 $\frac{1}{4}$ x7	4x18	400	10000
26	38	300	38	8 $\frac{1}{2}$	12 $\frac{1}{2}$	18	5000	2 $\frac{1}{4}$ x7	4x18	400	11000
6	48	150	48	8 $\frac{1}{2}$	9 $\frac{1}{2}$	18	5000	2x6	4x18	400	10000
7	48	200	48	8 $\frac{1}{2}$	10 $\frac{1}{2}$	18	5000	2 $\frac{1}{4}$ x7	4x18	400	11000
8	48	250	48	8 $\frac{1}{2}$	11 $\frac{1}{2}$	18	5000	2 $\frac{1}{4}$ x7	4x18	400	12000
9	48	300	48	8 $\frac{1}{2}$	12 $\frac{1}{2}$	18	5000	2 $\frac{1}{4}$ x7	4x18	400	13000
27	48	400	48	8 $\frac{1}{2}$	13 $\frac{1}{2}$	18	5000	3x8	4x18	400	16000
10	58	150	58	8 $\frac{1}{2}$	9 $\frac{1}{2}$	18	5000	2x6	4x18	400	10500
11	58	200	58	8 $\frac{1}{2}$	10 $\frac{1}{2}$	18	5000	2 $\frac{1}{4}$ x7	4x18	400	11500
12	58	250	58	8 $\frac{1}{2}$	11 $\frac{1}{2}$	18	5000	2 $\frac{1}{4}$ x7	4x18	400	13000
13	58	300	58	8 $\frac{1}{2}$	12 $\frac{1}{2}$	18	5000	2 $\frac{1}{4}$ x7	4x18	400	15000
28	62	400	62	8 $\frac{1}{2}$	14 $\frac{1}{2}$	18	5000	3x8	4x18	400	20000
14	68	200	68	8 $\frac{1}{2}$	10 $\frac{1}{2}$	18	5000	2 $\frac{1}{4}$ x7	4x18	400	14000
15	68	250	68	8 $\frac{1}{2}$	11 $\frac{1}{2}$	18	5000	2 $\frac{1}{4}$ x7	4x18	400	15000
16	68	300	68	8 $\frac{1}{2}$	12 $\frac{1}{2}$	18	5000	2 $\frac{1}{4}$ x7	4x18	400	16000
17	68	350	68	8 $\frac{1}{2}$	13 $\frac{1}{2}$	18	5000	2 $\frac{1}{4}$ x7	4x18	400	17000
18	76	250	76	8 $\frac{1}{2}$	10 $\frac{1}{2}$	18	5000	2 $\frac{1}{4}$ x7	4x18	400	18000
19	76	300	76	8 $\frac{1}{2}$	11 $\frac{1}{2}$	18	5000	2 $\frac{1}{4}$ x7	4x18	400	20000
20	76	300	76	8 $\frac{1}{2}$	12 $\frac{1}{2}$	18	5000	2 $\frac{1}{4}$ x7	4x18	400	22000
21	76	350	76	8 $\frac{1}{2}$	13 $\frac{1}{2}$	18	5000	2 $\frac{1}{4}$ x7	4x18	400	24000
22	88	300	88	8 $\frac{1}{2}$	12 $\frac{1}{2}$	24	5000	2 $\frac{1}{4}$ x8	6x24	400	26000
23	88	400	88	8 $\frac{1}{2}$	14 $\frac{1}{2}$	24	5000	3x8	6x24	400	31000
24	100	300	100	8 $\frac{1}{2}$	13 $\frac{1}{2}$	24	5000	2 $\frac{1}{4}$ x8	6x24	400	32000
25	100	400	100	8 $\frac{1}{2}$	14 $\frac{1}{2}$	24	5000	3x8	6x24	400	36000
29	110	300	110	8 $\frac{1}{2}$	13 $\frac{1}{2}$	24	5000	2 $\frac{1}{4}$ x8	6x24	400	36000

BERGER STEEL CLOTHES LOCKERS**WILL LAST A LIFETIME OF HARD USAGE**

Type S. S.
Single Tier Standard Louvre

**FIG. 3416**

Type No. P. D.
Double Tier, Perforated Metal Door

**FIG. 3417**

See opposite
page for sizes

Berger Steel Lockers are strong but simply constructed of heavy gage steel. They require small floor space; are fire retardant and rodent proof; sanitary and well ventilated; a multiple point locking device securely fastens the door, preventing petty theft; and the handsome baked on enamel finish insures a permanent luster.

The illustrations above show groups of three Lockers. A group consists of two or more Lockers fastened together side by side or back to back to fit any floor space. These Lockers are so made that they can be taken down, rearranged and reassembled without waste thru loss of parts.

Besides the types illustrated we can supply:

Type S. D. Double Tier—Standard Louvre.

Type F. S. Single Tier—Full Louvre (Same as Type S. S. illustrated except the Louvres extend full length of doors.)

Type F. D. Double Tier—Full Louvre.

Type P. S. Single Tier—Perforated Metal Door (Same as illustration above but each compartment is full height).

Lockers are usually shipped knocked down as the construction is so simple that they can be put together by any one of average intelligence without difficulty. All necessary bolts and instructions for erecting are furnished.

See following page for sizes.

BERGER STEEL CLOTHES LOCKERS—CONTINUED

Protect Against Pilferers, Rodents, Vermin and Fire

STANDARD SIZES

Single Tier				Double Tier									
Wth.	Dth.	Hgt.	No.	Wth.	Dth.	Hgt.	No.						
12	x	12	x	60	.....	226	12	x	12	x	36	.....	223
12	x	15	x	60	.....	256	12	x	15	x	36	.....	253
12	x	18	x	60	.....	286	12	x	18	x	36	.....	283
15	x	12	x	60	.....	526	15	x	15	x	36	.....	553
15	x	15	x	60	.....	556	15	x	18	x	36	.....	583
15	x	18	x	60	.....	586	18	x	18	x	36	.....	883
18	x	18	x	60	.....	886	12	x	12	x	42	.....	224
12	x	12	x	72	.....	227	12	x	15	x	42	.....	254
12	x	15	x	72	.....	257	12	x	18	x	42	.....	284
12	x	18	x	72	.....	287	15	x	15	x	42	.....	554
15	x	12	x	72	.....	527	15	x	18	x	42	.....	584
15	x	15	x	72	.....	557	18	x	18	x	42	.....	884
15	x	18	x	72	.....	587	18	x	21	x	56	.....	825
18	x	15	x	72	.....	857							
18	x	18	x	72	.....	887							
24	x	24	x	72	.....	447							

Note:
Sloping tops can be
furnished at an extra
cost for all sizes ex-
cept Nos. 447 and 825.

Note:
Sloping tops can be
furnished at an extra
cost for all sizes ex-
cept Nos. 447 and 825.

Suggested Sizes and Types for Various Uses.

SCHOOLS AND Y. M. C. A.'S		
Sizes		
Wth.	Dth.	Hgt.
12 x 15 x 60	S. S.	for wardrobe use.
12 x 15 x 36	F. D.	for gymnasium use.
(Also compartment lockers.)		

ARMORIES		
18 x 18 x 72	S. S.	
COUNTRY CLUBS		
24 x 24 x 72	F. S.	

TENNIS CLUBS		
15 x 18 x 36	F. D.	
POLICE AND FIRE DEPARTMENTS		
24 x 24 x 72	S. S. or F. S.	

FACTORIES		
12 x 15 x 72	F. S. or P. S.	

MINES		
Sizes		
Wth.	Dth.	Hgt.
12 x 15 x 72	F. S. or P. S.	
12 x 15 x 36	F. D. or P. D.	
12 x 15 x 42	F. D. or P. D.	

RAILROADS		
15 x 15 x 72	S. S. or F. S.	
15 x 18 x 72	S. S. or F. S.	

OFFICES		
12 x 15 x 72	S. S.	
15 x 18 x 72	S. S.	

PUBLIC GARAGES		
18 x 18 x 72	S. S.	

IRON CLAD TRIPLE HEM STEEL SHOP BOXES

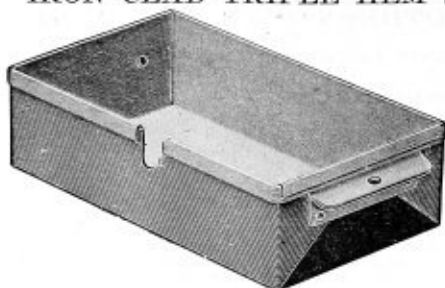


FIG. 3418

STRAIGHT STYLE-PATENTED

No.	1	4	7	14	17	20	23	24	25	26
Length.....in.	18	18	18	20	20	21	21	18½	18½	18½
Width....."	10	10	10	10	10	10	10	9½	9½	9½
Depth....."	5	5	5	5	5	5	5	6	6	6
Gage....."	20	18	16	18	16	20	18	20	18	16

TAPERING STYLE

STANDARD SIZES



FIG. 3419

No.		Long In.	Wide In.	Deep In.	Gage
29	Top.....	19¾	11¼	6	20
	Bottom.....	16	8	6	
32	Top.....	19¾	11¼	6	18
	Bottom.....	16	8	6	
35	Top.....	19¾	11¼	6	16
	Bottom.....	16	8	6	
41	Top.....	21¾	11¼	6	18
	Bottom.....	18	8	6	
44	Top.....	21¾	11¼	6	16
	Bottom.....	18	8	6	
45	Top.....	21¾	12¾	6	20
	Bottom.....	18½	9½	6	
46	Top.....	21¾	12¾	6	18
	Bottom.....	18½	9½	6	
47	Top.....	21¾	12¾	6	16
	Bottom.....	18½	9½	6	

STEEL SHOP PILING BOXES

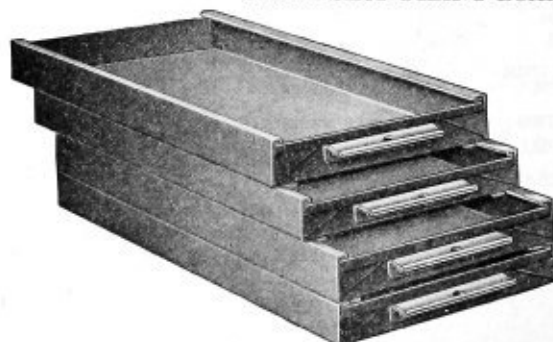


FIG. 3420

A new feature in piling boxes. Each box has upper and lower runners which engage when piled and prevent the sliding sideways or turning of the boxes.

The boxes can be moved backward upon each other to show contents, as illustrated.

This type of box made to order only.

Always state size, gage and quantity when asking quotations.

STEEL SHOP AND FOUNDRY BARRELS

Triple Hem Steel Barrels are made with a heavy triple reinforcing band or hoop around the top and bottom. The band and body are of one piece, producing not only stiffness and rigidity, but also smooth edges that will not cut the hands or floor, and doing away with loosely riveted hoops. The bottom is a solid flanged steel head, strongly riveted to shell.

Furnished in galvanized iron with soldered joints or galvanized after made when desired.

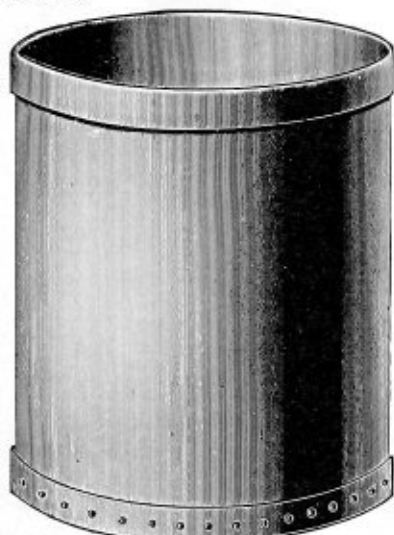


FIG. 3421

STANDARD SIZES, PAINTED BLACK

No.	Diam., Inches	High, Inches	Shell Gage	Bottom Gage
250	18	30	18	16
253	18	30	16	14
256	18	30	14	12

HALF BARRELS

260	15	24	20	18
263	15	24	18	16
266	15	24	16	14
269	15	24	14	12

STEEL KEGS

200	12	16	18	16
202	12	16	16	14
204	12	18	18	16
206	12	18	16	14

Provided with handles only when specified.

Special sizes to order.

Always give size, gage and quantity when asking quotations.



FIG. 3422

ALL STEEL SHOP AND STORE STOOL

Being constructed entirely from steel with strongly riveted joints, this stool will appeal to manufacturers and large users of stools as being vastly superior to the wooden kind.

It has no joints to shrink and cause the stool to come to pieces.

Seat 12 inches in diameter.

Stock sizes—20 inches, 22 inches, 24 inches and 26 inches high. Weight 8 pounds.



FIG. 3423

Prices on application.

"IRON CLAD" TWO-MAN HAND BARROWS

STOCK SIZES

No.	Long In.	Wide In.	Deep In.	Gage Steel
56	24	18	6	18
59	24	18	6	16

"MAC-IT" SAFETY OR HOLLOW SET SCREWS



FIG. 3424



FIG. 3425

Sizes not shown are special.

PRICE PER 100

One wrench with each 25 screws.

Diam. of Screw....	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
	16	14	12-13	12	11	10	9	8
Threads to Inch....								
$\frac{3}{8}$	\$*5.00	\$ 6.00	\$ 7.00	.....	.....	.....	.....	.....
$\frac{7}{16}$	5.00	*6.00	7.00	.....	.....	.....	.....	.....
$\frac{1}{2}$	*5.00	*6.00	*7.00	.....	.....	.....	.....	.....
$\frac{9}{16}$	6.00	7.00	7.00	\$ *8.00	.....	.....	.....	.....
$\frac{5}{8}$	6.00	7.00	*7.00	8.00	\$*10.00	.....	.....	.....
$\frac{3}{4}$	*6.00	7.00	*8.00	9.00	*10.00	*12.00	.....	.....
$\frac{7}{8}$	7.00	8.00	8.50	9.00	11.00	*12.00	\$*15.00	.....
1	*7.00	8.00	9.00	9.50	*12.00	*13.00	15.00	\$*20.00
1 $\frac{1}{8}$	7.25	9.00	11.00	11.50	13.00	14.00	15.00	20.00
1 $\frac{1}{4}$	7.50	9.50	11.00	12.00	*14.00	*16.00	18.00	20.00
1 $\frac{1}{2}$	7.75	10.00	11.50	13.00	*16.00	20.00	22.00	24.00
1 $\frac{3}{4}$	8.00	10.50	11.00	14.50	18.00	22.00	26.00	28.00
2	8.25	11.00	13.00	16.00	20.00	24.00	32.00	32.00
2 $\frac{1}{4}$	.....	.....	13.50	17.50	22.00	26.00	34.00	36.00
2 $\frac{1}{2}$	.....	.....	14.00	18.50	24.00	28.00	37.00	40.00
2 $\frac{3}{4}$	.....	.....	14.50	19.50	25.00	30.00	40.50	44.00
3	.....	.....	15.00	20.00	26.00	32.00	43.25	48.00
3 $\frac{1}{4}$	.....	.....	.....	.....	.....	34.00	46.00	50.00
3 $\frac{1}{2}$	.....	.....	.....	.....	.....	36.00	48.00	52.00
4	.....	.....	.....	.....	.....	42.00	50.00	54.00
Extra Wrenches Each	.05	.08	.08	.09	.09	.10	.12	.14

*These sizes in stock U. S. S. thread, cup point—others furnished in reasonable time.

$\frac{5}{8}$ -inch and $\frac{1}{4}$ -inch hollow are not practical and are made on order only, not less than 1,000 at a time. We suggest the use of "Mac-It" Headless (the "Mac-It" Headless Screw will not split and will not break the screw driver).

With the above Hollow Screws we are prepared to furnish bent type or ell shaped wrenches.

HOLLOW SET SCREWS

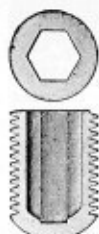


FIG. 3426

Hollow Set Screws are designed to replace both the headless and the square-head set screws and *one length* of each size is all that is required for any depth of hole.

Made of steel, drawn with a hexagonal hole which insures elasticity and prevents loosening during changes of temperature.

By putting two screws in a hole they are locked, and the thread-strain is equalized.

One length is efficient for any depth of hole, which obviates the carrying of a great variety of lengths, as is necessary with the old styles.

Short screws do not lose lead of thread as do long ones, and hence the new Hollow Set Screws set at once at bottom of hole.



FIG. 3427

Deep holes need only be threaded at bottom, and as far up as diameter of Hollow Set Screw; balance can be counter-bored. No shoulder needed on collars and no countersinking, effecting a saving of material and labor.

Hollow Set Screws can be sealed against rust and wet by filling the hole with wax; oil will also prevent rust. Wax makes the screw valuable for use in water on propellers of steamers or yachts, or for similar use.

Protectors and hubs do not have to be cast on revolving shafts and elsewhere to avoid protruding heads which too frequently catch workmen's clothing, causing accidents, as the Hollow Screws have no projections. This life-saving feature alone is sufficient to commend Hollow Set Screws in preference to all others.

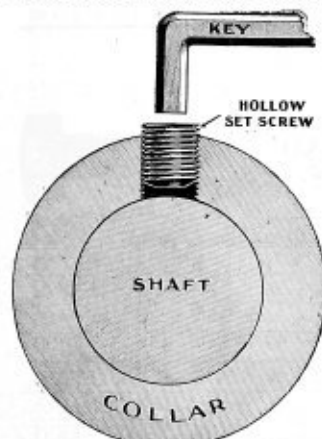


FIG. 3428

LIST PRICES FOR SCREWS

(One key is packed with each box of screws)

This illustration shows the hexagonal steel wrench or "key" supplied with these screws. One wrench is packed with each box of screws.

The power on wrench is applied equally to the entire length of the screw, so there is little or no torsional strain and the whole force is applied largely at the point of the screw, where it is required. With the old-style screw the head is liable to twist off.

Made in four sizes only. United States Standard Thread (No V Thread); Cup and Round Points.

Diameter	Thread	Length	List Prices Per 100	Packed
$\frac{3}{8}$ -inch	16	$\frac{3}{8}$ -inch	\$3.30	100 in box
$\frac{1}{2}$ " " " "	12 and 13	$\frac{1}{2}$ " " " "	3.90	100 " "
$\frac{5}{8}$ " " " "	11	$\frac{11}{16}$ " " " "	5.40	50 " "
$\frac{3}{4}$ " " " "	10	$\frac{7}{8}$ " " " "	8.40	50 " "

LIST PRICES FOR EXTRA WRENCHES OR KEYS

For $\frac{3}{8}$ -inch screws.....	per 100, \$1.15
" " $\frac{1}{2}$ " " "	" " 1.75
For $\frac{5}{8}$ -inch screws.....	per 100, \$2.30
" " $\frac{3}{4}$ " " "	" " 3.50

* We make 1/2-inch screws with 12 and 13 threads, and unless otherwise specified always send 13.



FIG. 3429

IRON SET SCREWS

SQUARE HEADS

PRICE PER 100



FIG. 3430

Threads to Inch	20	18	16	14	12 or 13	12	11	10	9	8	7	7
Diameter of Screw	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	1	$1\frac{1}{2}$	$1\frac{3}{4}$
$\frac{1}{4}$	1.80	2.00	2.35	.....	.....	.....	.....	.....	.....	.....	.....	.....
$\frac{3}{8}$	1.90	2.10	2.45	.....	.....	.....	.....	.....	.....	.....	.....	.....
$\frac{1}{2}$	2.00	2.30	2.50	2.90	3.40	5.00	5.00	.....	.....	.....	.....	.....
$\frac{5}{8}$	2.10	2.30	2.60	3.00	3.60	5.50	5.50	.....	.....	.....	.....	.....
$\frac{3}{4}$	2.15	2.35	2.65	3.10	3.80	5.75	5.75	10.00	.....	.....	.....	.....
1	2.30	2.50	2.85	3.50	4.30	6.50	6.50	11.00	15.50	.....	.....	.....
$1\frac{1}{4}$	2.50	2.70	3.10	4.00	4.80	7.25	7.25	12.00	16.20	22.00	.....	.....
$1\frac{1}{2}$	2.75	3.00	3.50	4.50	5.40	8.00	8.00	12.80	17.70	24.00	41.70	.....
$1\frac{3}{4}$	3.25	3.50	4.00	5.15	6.00	8.80	8.80	13.60	19.20	26.00	45.00	54.00
2	3.75	4.00	4.50	5.75	6.75	9.00	9.00	14.50	20.70	28.00	48.80	58.80
$2\frac{1}{4}$	4.25	4.50	5.00	6.35	7.50	10.40	10.40	15.40	22.20	30.00	51.00	62.00
$2\frac{1}{2}$	4.75	5.00	5.50	6.75	8.25	11.20	11.20	16.30	23.70	32.00	54.80	66.00
$2\frac{3}{4}$	5.25	5.50	6.00	7.20	9.00	12.00	12.00	17.30	25.20	34.00	58.20	70.20
3	.....	.....	.....	7.60	9.75	12.75	12.75	18.40	26.70	36.00	61.50	75.50
$3\frac{1}{4}$	.....	.....	.....	8.00	10.50	13.50	13.50	19.50	28.20	38.00	64.80	79.80
$3\frac{1}{2}$	.....	.....	.....	8.50	11.25	14.30	14.30	20.75	29.70	40.00	68.10	84.10
$3\frac{3}{4}$	.....	.....	.....	9.00	12.00	15.10	15.10	22.00	31.20	42.00	71.40	88.40
4	.....	.....	.....	.....	.....	.....	15.90	23.50	32.70	44.00	74.70	92.70
$4\frac{1}{4}$	.....	.....	.....	.....	.....	.....	16.70	25.00	34.20	46.00	78.00	97.00
$4\frac{1}{2}$	.....	.....	.....	.....	.....	.....	.....	26.50	35.70	48.00	81.30	101.30
$4\frac{3}{4}$	.....	.....	.....	.....	.....	.....	.....	.....	37.20	50.00	84.60	105.60
5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Add for each $\frac{1}{4}$ in.	.50	.60	.70	.80	.90	1.10	1.30	1.50	1.70	2.25	3.30	4.30

For List Price Steel Set Screws add 25 per cent to above list.



FIG. 3431

SQUARE HEAD AND
HEXAGON HEAD
CAP SCREWS

PRICE PER 100



FIG. 3432

Diam. Square Head	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$
Diam. Hexag. Head	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$
Length, Head	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Threads, Inch	20	18	16	14	12 or 13	12	11	10	9	8	7	7
Diameter, Screw	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	1	$1\frac{1}{2}$	$1\frac{3}{4}$
$\frac{1}{4}$	3.00	3.25	3.75	4.50	5.70	.....	.....	.....	.....	.....	.....	.....
$\frac{3}{8}$	3.15	3.40	3.90	4.70	5.80	9.25	9.25	.....	.....	.....	.....	.....
$\frac{1}{2}$	3.25	3.50	4.00	4.90	5.90	9.50	9.50	.....	.....	.....	.....	.....
$\frac{5}{8}$	3.50	3.75	4.25	5.30	6.50	9.50	9.50	12.60	.....	.....	.....	.....
$\frac{3}{4}$	3.75	4.00	4.50	5.70	7.10	10.00	10.00	13.50	18.40	.....	.....	.....
$1\frac{1}{4}$	4.00	4.25	4.85	6.10	7.70	10.75	10.75	14.50	19.70	22.75	.....	.....
2	4.25	4.85	5.20	6.50	8.30	11.50	11.50	15.50	21.00	25.00	34.00	38.50
$2\frac{1}{4}$	4.70	5.35	5.55	7.15	8.90	12.00	12.00	16.50	22.40	27.25	36.75	42.00
$2\frac{1}{2}$	5.25	5.80	6.00	7.50	9.50	13.00	13.00	17.50	23.70	29.50	39.50	45.50
$2\frac{3}{4}$	5.75	6.30	6.65	7.90	10.10	14.40	14.40	19.00	25.00	31.75	42.25	49.00
3	6.25	6.80	7.20	8.60	10.70	15.20	15.20	20.60	26.40	34.00	45.00	52.50
$3\frac{1}{4}$	.....	.....	.....	9.15	11.50	16.00	16.00	22.10	28.20	36.25	47.75	56.00
$3\frac{1}{2}$	.....	.....	.....	9.75	12.30	17.30	17.30	23.75	30.00	38.50	50.50	59.50
$3\frac{3}{4}$	.....	.....	.....	10.50	13.10	18.60	18.60	25.30	31.80	40.75	53.25	63.00
4	.....	.....	.....	11.10	13.90	19.90	19.90	26.90	33.60	43.00	56.00	66.50
$4\frac{1}{4}$	.....	.....	.....	.....	.....	.....	21.20	28.50	35.40	45.25	58.75	70.00
$4\frac{1}{2}$	.....	.....	.....	.....	.....	.....	22.50	30.10	37.20	47.50	61.50	73.50
$4\frac{3}{4}$	.....	.....	.....	.....	.....	.....	.....	31.70	39.00	49.75	64.25	77.00
5	.....	.....	.....	.....	.....	.....	.....	.....	40.80	52.00	67.00	80.50
Add for each $\frac{1}{4}$ inch	.40	.50	.60	.70	.80	1.30	1.30	1.60	1.80	2.25	2.75	3.50

Round



FIG. 3433

ROUND HEAD AND FILISTER HEAD CAP SCREWS MILLED FROM SOLID BAR

Filister



FIG. 3434

PRICE PER 100

Diam. Head..	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$
Length Head..	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	1
Threads Inch.	40	24	20	18	16	14	12-13	12	11	10	9	8
Diam. Screws	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	1
$\frac{3}{4}$ inch	2.00	2.25	2.50	3.00	3.50	4.00	5.00	.....	.....	.....	.....	.....
1 "	2.25	2.50	2.75	3.25	3.75	4.25	5.30	6.60	.....	.....	.....	.....
$1\frac{1}{4}$ "	2.50	2.75	3.00	3.50	4.00	4.50	5.60	6.90	9.00	.....	.....	.....
$1\frac{1}{2}$ "	2.75	3.00	3.25	3.75	4.25	4.75	5.90	7.20	9.50	12.00	.....	.....
$1\frac{3}{4}$ "	3.00	3.25	3.50	4.00	4.50	5.00	6.20	7.50	10.00	12.50	15.25	.....
2 "	3.25	3.50	3.75	4.35	5.00	5.50	6.75	8.00	10.75	13.00	16.00	19.20
$2\frac{1}{4}$ "	3.50	3.75	4.00	4.75	5.50	6.00	7.25	8.50	11.50	13.75	16.75	20.20
$2\frac{1}{2}$ "	3.75	4.00	4.25	5.15	6.00	6.50	7.75	9.00	12.00	14.50	17.50	21.25
$2\frac{3}{4}$ "	4.25	4.50	4.75	5.65	6.50	7.00	8.25	9.50	12.75	15.25	18.20	22.40
3 " .....	.....	4.75	5.00	5.95	7.00	7.50	8.75	10.00	13.50	16.00	19.10	23.60
$3\frac{1}{4}$ " .....	.....	.....	.....	6.35	7.50	8.00	9.25	10.50	14.25	16.75	20.00	24.85
$3\frac{1}{2}$ " .....	.....	.....	.....	.....	8.00	8.50	9.75	11.00	15.00	17.50	21.00	26.10
$3\frac{3}{4}$ " .....	.....	.....	.....	.....	.....	9.00	10.25	11.50	15.75	18.25	22.00	27.35
4 " .....	.....	.....	.....	.....	.....	.....	10.75	12.00	16.50	19.00	23.00	28.60
$4\frac{1}{4}$ " .....	.....	.....	.....	.....	.....	.....	.....	12.50	17.25	19.75	24.00	29.85
$4\frac{1}{2}$ " .....	.....	.....	.....	.....	.....	.....	.....	.....	18.00	20.50	25.00	31.10
$4\frac{3}{4}$ " .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	21.25	26.00	32.35
5 " .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	27.00	33.60
Add for each $\frac{1}{4}$	.25	.25	.25	.40	.50	.50	.50	.50	.75	.75	1.00	1.25



FIG. 3435

FLAT HEAD CAP SCREWS

MILLED FROM SOLID BAR

PRICE PER 100

Diam. Head. in.	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$
Threads to Inch.	40	24	20	18	16	14	12	12	11	10
Diam. Screw. in.	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
$\frac{3}{4}$ inch	2.25	2.50	3.10	4.00	5.00	.....	.....	.....	.....	.....
1 "	2.50	2.75	3.35	4.25	5.30	6.60	.....	.....	.....	.....
$1\frac{1}{4}$ "	2.75	3.00	3.60	4.50	5.60	6.90	9.00	.....	.....	.....
$1\frac{1}{2}$ "	3.00	3.25	3.85	4.75	5.90	7.20	9.50	12.00	.....	.....
$1\frac{3}{4}$ "	3.25	3.50	4.10	5.00	6.20	7.50	10.00	12.50	14.50	.....
2 " .....	.....	3.75	4.35	5.50	6.75	8.00	10.75	13.00	15.25	19.20
$2\frac{1}{4}$ " .....	.....	.....	4.75	6.00	7.25	8.50	11.50	13.75	16.00	20.20
$2\frac{1}{2}$ " .....	.....	.....	.....	6.50	7.75	9.00	12.00	14.50	16.75	21.25
$2\frac{3}{4}$ " .....	.....	.....	.....	7.00	8.25	9.50	12.75	15.25	17.50	22.40
3 " .....	.....	.....	.....	.....	8.75	10.00	13.50	16.00	18.30	23.60
Add for each $\frac{1}{4}$	.25	.25	.40	.50	.50	.50	.50	.75	1.00	1.25



FIG. 3436

BUTTON HEAD CAP SCREWS MILLED FROM SOLID BAR

PRICE PER 100



FIG. 3437

Diam. Head, in.	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	1	$1\frac{1}{4}$
Threads to Inch.	40	24	20	18	16	14	12	12	11	10
Diam. Screw....	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	
$\frac{3}{4}$	2.25	2.50	3.00	3.50	4.00	5.00	.....	.....	.....	.....
1	2.50	2.75	3.25	3.75	4.25	5.30	6.60	.....	.....	.....
$1\frac{1}{4}$	2.75	3.00	3.50	4.00	4.50	5.60	6.90	9.00	.....	.....
$1\frac{1}{2}$	3.00	3.25	3.75	4.25	4.75	5.90	7.20	9.50	12.00	.....
$1\frac{3}{4}$	3.25	3.50	4.00	4.50	5.00	6.20	7.50	10.00	12.50	18.20
2	.....	3.75	4.35	5.00	5.50	6.75	8.00	10.75	13.00	19.20
$2\frac{1}{4}$	.....	.....	4.75	5.50	6.00	7.25	8.50	11.50	13.75	20.20
$2\frac{1}{2}$	.....	.....	.....	6.00	6.50	7.75	9.00	12.00	14.50	21.25
$2\frac{3}{4}$	.....	.....	.....	.....	7.00	8.25	9.50	12.75	15.25	22.40
3	.....	.....	.....	.....	.....	8.75	10.00	13.50	16.00	23.60
Add for each $\frac{1}{4}$	.25	.25	.40	.50	.50	.50	.50	.75	.75	1.15

*No. 4 Wire.

STYLES OF POINTS



FIG. 3438

U. S. S. Threads carried in stock. V Threads furnished to order only. Please specify on all orders which style of thread is desired, also style of point.

Cup and Oval Point Set Screws, case hardened, are regular. All others are special and made to order; prices based on quantity.

Set Screw list applies to Headless Set or Gib Screws, measurement being taken over all.

No screw which has a head more than $\frac{1}{16}$ of an inch larger than the body shall be classed as a Set Screw.

Set Screws of diameters or threads other than listed take special price based on quantity.

Special price on Soft Screws, Extra Finished Heads and Special Points.

Steel Set Screws listed at 25 per cent advance over Iron.

IRON MACHINE SCREWS

Flat Head

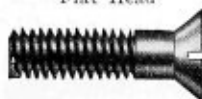


FIG. 3439

Round Head



FIG. 3440

Fillister Head

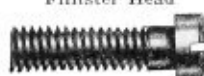


FIG. 3441

List of November 18, 1912.

Price per Gross.

	STANDARD THREADS PER INCH.																	
	48				30		30			18				14				
	56	48	32, 36,		32	30	32	24, 30,	20	20	16, 18,	16	16	14	13			
	64	56	40		36	32	36	32	24	24	20	18	18	16	16			
No.	2	3	4	5	6	7	8	9	10	12	14	16	18	20	24	30	34	
In.	Cts	Cts	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	
$\frac{1}{8}$	30	30	30	35	35	40	40	...	...	...	...	...	...	...	...	...	...	
$\frac{3}{16}$	30	30	30	35	35	40	40	60	60	...	...	...	...	...	...	...	...	
$\frac{1}{4}$	30	30	30	35	35	40	40	60	60	70	85	...	...	...	...	...	...	
$\frac{5}{16}$	32	32	32	37	37	44	44	65	65	75	90	115	...	...	...	...	...	
$\frac{3}{8}$	32	32	32	37	37	44	44	65	65	75	90	115	150	190	230	...	...	
$\frac{7}{16}$	34	34	34	39	39	48	48	70	70	80	95	120	160	200	240	...	...	
$\frac{1}{2}$	34	34	34	39	39	48	48	70	70	80	95	120	160	200	240	...	...	
$\frac{9}{16}$	37	37	37	42	42	52	52	75	75	85	100	125	170	210	250	...	...	
$\frac{5}{8}$	37	37	37	42	42	52	52	75	75	85	100	125	170	210	250	...	...	
$\frac{11}{16}$	41	41	41	46	46	...	...	...	...	...	...	...	...	...	...	...	...	
$\frac{3}{4}$	41	41	41	46	46	56	56	80	80	90	105	130	180	220	260	400	510	
$\frac{7}{8}$	45	45	45	50	50	...	...	...	...	...	...	...	...	...	...	...	...	
$\frac{15}{16}$	45	45	45	50	50	60	60	85	85	95	115	140	190	230	270	425	585	
1	...	...	50	55	55	...	...	...	...	...	...	...	...	...	...	...	...	
$1\frac{1}{8}$	...	...	50	55	55	65	65	90	90	100	125	150	200	240	280	450	660	
$1\frac{1}{4}$	...	...	53	60	60	70	70	100	100	110	135	160	220	260	300	500	700	
$1\frac{1}{2}$	...	...	60	65	65	75	75	110	110	120	145	175	240	280	320	525	735	
$1\frac{3}{8}$	...	...	65	70	70	80	80	120	120	130	155	190	260	300	340	575	800	
$1\frac{1}{2}$	...	...	70	75	75	85	85	130	130	140	165	210	280	320	360	600	800	
$1\frac{5}{8}$	...	...	80	85	85	95	95	140	140	150	175	230	300	340	380	635	...	
$1\frac{3}{4}$	...	...	90	95	95	105	105	150	150	160	185	250	320	360	420	665	860	
$1\frac{7}{8}$	...	...	100	105	105	115	115	160	160	170	200	270	340	380	440	700	...	
2	...	...	110	115	115	125	125	170	170	180	220	290	360	400	460	735	940	
$2\frac{1}{4}$	...	...	...	125	125	145	145	190	190	220	260	330	400	440	480	800	1030	
$2\frac{1}{2}$	...	...	...	...	...	165	165	220	220	250	280	350	440	490	530	890	1150	
$2\frac{3}{4}$	...	...	...	...	...	190	190	250	250	290	320	400	490	540	590	985	...	
3	...	...	...	...	...	230	230	290	290	350	380	450	560	600	740	1100	...	
$3\frac{1}{4}$	...	...	...	...	...	...	...	330	330	425	450	550	650	700	880	1300	...	
$3\frac{1}{2}$	...	...	...	...	...	...	...	375	375	500	525	650	750	850	1010	1500	...	
$3\frac{3}{4}$	...	...	...	...	...	...	...	...	...	...	600	750	850	925	1220	1750	...	
4	...	...	...	...	...	...	...	...	...	...	675	850	960	1025	1350	2050	...	

BRASS MACHINE SCREWS

Flat Head

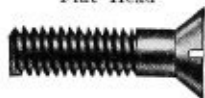


FIG. 3442

Round Head



FIG. 3443

Fillister Head

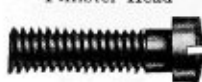


FIG. 3444

List of November 18, 1912.

Price per Gross

	STANDARD THREADS PER INCH.																	
	48				30		30				18				14			
	56	48		32, 36,	32	30	32		24, 30,	20	20		16, 18,	16	16	14	13	
	64	56		40	36	32	36		32	24	24		20	18	18	16		
No.	2	3	4	5	6	7	8	9	10	12	14	16	18	20	24	30	34	
In.	Cts	Cts	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	
$\frac{1}{8}$	32	32	36	46	46	70	70	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
$\frac{3}{16}$	32	32	36	46	46	70	70	100	100	.....	.....	.....	.....	.....	.....	.....	.....	
$\frac{1}{4}$	32	32	36	46	46	70	70	100	100	125	165	.....	.....	.....	.....	.....	.....	
$\frac{5}{16}$	34	34	38	49	49	75	75	105	105	135	175	.....	.....	.....	.....	.....	.....	
$\frac{3}{8}$	36	36	40	52	52	80	80	110	110	145	185	290	370	400	550	.....	.....	
$\frac{7}{16}$	38	38	42	55	55	85	85	115	115	155	200	305	390	480	560	.....	.....	
$\frac{1}{2}$	40	40	44	58	58	90	90	125	125	165	215	320	410	500	575	.....	.....	
$\frac{9}{16}$	43	43	47	62	62	95	95	135	135	175	230	335	430	525	630	.....	.....	
$\frac{5}{8}$	46	46	50	66	66	100	100	145	145	185	245	350	450	550	650	.....	.....	
$\frac{11}{16}$	49	49	53	70	70	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
$\frac{3}{4}$	52	52	56	74	74	110	110	165	165	205	275	380	490	600	670	.....	1575	
$\frac{7}{8}$	55	55	59	78	78	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
$\frac{15}{16}$	58	58	62	82	82	120	120	185	185	225	305	410	530	650	740	.....	1710	
1	.....	.....	65	86	86	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
$1\frac{1}{8}$	.....	.....	70	90	90	130	130	205	205	245	335	440	570	700	850	1375	1850	
$1\frac{1}{4}$	.....	.....	80	105	105	145	145	220	220	265	355	465	600	750	900	.....	.....	
$1\frac{1}{2}$	.....	.....	90	120	120	160	160	235	235	285	375	490	630	800	990	1875	2210	
$1\frac{3}{8}$	.....	.....	100	135	135	175	175	250	250	305	395	520	660	850	1150	.....	.....	
$1\frac{1}{2}$	.....	.....	110	150	150	190	190	265	265	325	415	550	690	900	1200	2250	2665	
$1\frac{5}{8}$	.....	.....	125	170	170	210	210	285	285	350	440	585	730	950	.....	.....	.....	
$1\frac{3}{4}$	.....	.....	140	190	190	230	230	305	305	375	465	620	770	1000	1270	2425	2810	
$1\frac{7}{8}$	.....	.....	155	210	210	250	250	325	325	400	490	660	810	1050	.....	.....	.....	
2	.....	.....	170	230	230	270	270	345	345	425	515	700	860	1100	1350	2600	3020	
$2\frac{1}{4}$	.....	.....	.....	270	270	310	310	385	385	475	565	800	975	1200	1490	2800	3295	
$2\frac{1}{2}$	.....	.....	.....	.....	.....	.....	.....	465	465	580	680	900	1050	1350	1550	3050	3565	
$2\frac{3}{4}$	.....	.....	.....	.....	.....	.....	.....	600	600	700	800	1000	1250	1500	1700	3300	.....	
3	.....	.....	.....	.....	.....	.....	.....	750	750	850	950	1100	1500	1650	1900	3600	.....	
$3\frac{1}{4}$	.....	.....	.....	.....	.....	.....	.....	900	900	1050	1150	1500	1750	1850	2250	3950	.....	
$3\frac{1}{2}$	.....	.....	.....	.....	.....	.....	.....	1100	1100	1250	1500	1800	1950	2200	2550	4275	.....	
$3\frac{3}{4}$	.....	.....	.....	.....	.....	.....	.....	1350	1350	1500	1850	2000	2250	2500	2800	4660	.....	
4	.....	.....	.....	.....	.....	.....	.....	1650	1650	1800	2200	2500	2650	2800	3200	4950	.....	

WOOD SCREWS

LENGTH 1-4 INCH

No. 0 1 2 3

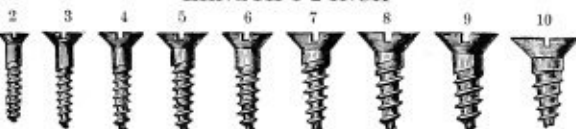


LENGTH 3-8 INCH

No. 1 2 3 4 5 6 7



LENGTH 1-2 INCH



LENGTH 5-8 INCH



LENGTH 3-4 INCH



LENGTH 7-8 INCH



LENGTH 1-INCH



FIG. 3445

Illustrations are actual size—larger in stock
FOR PRICE LIST SEE FOLLOWING PAGES

IRON WOOD SCREWS

Round Head



FIG. 3446

Flat Head



FIG. 3447

PRICE PER GROSS

No.	Length of Screw, Inches									
	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/4	1 1/2	1 3/4
0	\$0.72	\$0.72								
1	.72	.72	\$0.72	\$0.72						
2	.72	.72	.72	.72	\$0.72	\$0.74				
3	.72	.72	.72	.72	.75	.78	\$0.80	\$0.88	\$0.98	
4	.72	.72	.75	.75	.78	.82	.84	.92	1.05	
5		.75	.78	.78	.82	.85	.87	.98	1.10	\$1.30
6		.78	.80	.82	.85	.90	.92	1.05	1.15	1.35
7		.82	.84	.86	.90	.94	.98	1.10	1.20	1.45
8		.88	.90	.92	.95	1.00	1.05	1.15	1.30	1.50
9		.94	.96	.98	1.00	1.05	1.10	1.20	1.35	1.55
10			1.05	1.07	1.10	1.15	1.20	1.30	1.40	1.60
11			1.10	1.12	1.15	1.25	1.30	1.40	1.50	1.70
12			1.20	1.20	1.25	1.35	1.40	1.55	1.65	1.80
13				1.25	1.35	1.45	1.60	1.70	1.80	2.00
14				1.30	1.50	1.55	1.70	1.90	2.00	2.25
15					1.65	1.75	2.00	2.15	2.35	2.60
16					1.80	2.00	2.50	2.50	2.80	2.90
17							2.70	2.75	3.20	3.50
18							2.80	3.30	3.80	4.00
20							3.50	4.00	4.30	4.50
22								4.80	5.10	5.20
24								5.40	5.90	6.00

No.	Length of Screw, Inches									
	2	2 1/4	2 1/2	2 3/4	3	3 1/2	4	4 1/2	5	6
5	\$1.45	\$1.55	\$1.90							
6	1.50	1.60	2.00	\$2.40	\$2.95					
7	1.55	1.65	2.10	2.60	3.00					
8	1.60	1.75	2.20	2.70	3.05	\$3.90	\$4.90			
9	1.65	1.85	2.30	2.80	3.10	4.00	5.10			
10	1.75	1.95	2.40	2.90	3.15	4.10	5.20			
11	1.85	2.05	2.50	3.00	3.20	4.20	5.30			
12	2.00	2.20	2.60	3.10	3.30	4.30	5.40	\$7.00	\$8.10	\$10.00
13	2.20	2.35	2.70	3.20	3.40	4.40	5.60	7.20	8.30	10.30
14	2.45	2.65	2.90	3.30	3.50	4.50	5.90	7.60	8.60	11.00
15	2.75	3.10	3.30	3.60	3.80	4.75	6.20	7.85	9.10	11.60
16	3.10	3.50	3.65	3.90	4.20	4.95	6.50	8.15	9.70	12.40
17	3.70	3.85	4.20	4.50	4.80	5.40	7.00	8.60	10.10	13.00
18	4.20	4.55	4.70	5.00	5.50	6.15	7.60	9.15	11.00	14.50
20	4.80	5.30	5.80	6.10	6.50	7.30	8.60	9.85	11.50	16.00
22	5.50	6.10	6.70	7.20	7.50	8.70	9.70	11.20	13.00	18.00
24	6.40	6.90	7.50	8.50	8.70	10.20	11.20	13.50	15.00	20.00
26					10.50	12.00	14.00	16.00	18.00	23.00
28							16.00	18.50	21.00	27.00
30							18.50	21.50	24.00	30.50

The following varieties of Iron Screws are invoiced from this list at varying discounts: flat, round, fillister and oval head screws, dowel, winged, headless, pinched, bung head and felloe screws, bright, blued, nickel-plated, silver plated, brassed, bronzed, coppered, japanned, lacquered and tinned, also drive screws.

BRASS WOOD SCREWS

Flat Head



FIG. 3448

Round Head



FIG. 3449

PRICE PER GROSS

No.	Length of Screw, Inches									
	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/4	1 1/2	1 3/4
0	\$0.84	\$0.84								
1	.84	.87	\$0.92	\$0.96						
2	.88	.92	.96	1.00	\$1.12	\$1.40				
3	.92	.97	1.02	1.08	1.18	1.50	\$1.65	\$2.10		
4	.97	1.04	1.08	1.15	1.25	1.55	1.70	2.20	\$2.95	
5	1.04	1.12	1.20	1.30	1.40	1.60	1.75	2.25	3.05	
6		1.20	1.30	1.40	1.55	1.65	1.80	2.35	3.10	\$3.95
7		1.35	1.45	1.60	1.75	1.90	2.10	2.45	3.20	4.00
8		1.50	1.65	1.85	2.00	2.20	2.45	2.85	3.30	4.10
9			1.90	2.10	2.30	2.50	2.80	3.20	3.65	4.20
10			2.15	2.40	2.65	2.90	3.15	3.50	4.25	4.70
11				2.65	3.00	3.35	3.65	4.10	4.65	5.35
12				3.00	3.35	3.70	4.10	4.65	5.35	6.05
13				3.35	3.70	4.10	4.55	5.35	5.95	6.70
14				3.70	4.10	4.55	5.05	5.85	6.65	7.35
15				4.10	4.55	5.05	5.60	6.55	7.60	8.65
16				4.55	5.05	5.60	6.65	7.20	8.35	9.50
17								7.85	9.15	10.45
18							7.40	9.35	10.85	12.40
20								10.45	12.65	14.50
22									14.50	16.85
24										18.90

No.	Length of Screw, Inches									
	2	2 1/4	2 1/2	2 3/4	3	3 1/2	4	4 1/2	5	6
6	\$5.15									
7	5.20									
8	5.25	\$6.85								
9	5.30	6.95	\$9.40	\$11.50						
10	5.40	7.05	9.50	11.65	\$13.70	\$15.85				
11	6.15	7.25	9.60	11.80	13.85	16.00				
12	6.85	7.90	9.70	11.95	14.00	16.15	\$18.60			
13	7.55	8.80	9.85	12.10	14.10	16.30	18.80			
14	8.45	9.80	10.75	12.25	14.30	16.45	19.00	\$22.60		
15	9.75	10.75	11.85	13.00	14.60	16.60	19.25	22.80		
16	10.70	11.90	13.00	14.20	15.40	17.70	20.35	23.40	\$26.90	\$31.00
17	11.70	13.00	14.30	15.65	16.80	19.40	22.30	25.75	29.60	34.05
18	13.90	15.40	16.95	18.40	19.95	22.75	26.90	30.90	35.50	40.80
20	16.30	18.00	19.85	21.60	23.40	26.90	30.80	35.40	40.70	46.80
22	18.90	20.95	23.00	25.00	27.10	31.20	36.00	41.40	47.60	54.75
24	21.00	23.30	25.50	28.00	31.15	35.80	40.70	46.80	53.80	61.90
26					35.85	41.20	47.35	54.40	62.60	72.95
28					41.15	47.45	54.55	62.70	72.15	82.95
30					47.45	54.55	62.70	72.15	82.95	93.35

The following varieties of Screws are invoiced from this list, at varying discounts: flat, round, fillister, and oval head Screws, of brass, bronze or phosphor bronze, bronzed or lacquered, nickel and silver-plated on brass.

HANGER SCREWS

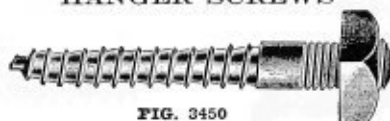


FIG. 3450

PRICE PER 100

One end cut with deep wood screw thread, the other fitted with chamfered nuts, finished points.

Length Over All Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$
3	\$5.00	\$5.75	.....	.....	.....	.....	.....	.....	.....	.....
4	5.50	6.50	.....	.....	.....	.....	.....	.....	.....	.....
5		7.50	9.50	.....	.....	.....	.....	.....	.....	.....
6		8.00	10.50	13.00	16.00	.....	.....	.....	.....	.....
7		8.50	11.25	14.50	18.00	25.00	.....	.....	.....	.....
8		9.00	12.00	15.50	19.50	27.00	36.00	.....	.....	.....
9			12.75	16.50	21.00	28.50	38.00	52.00	.....	.....
10			13.50	17.50	22.00	30.00	41.00	56.00	70.00	80.00
11				18.25	23.00	31.50	43.00	59.50	74.00	85.00
12				19.00	24.00	33.00	45.00	63.00	78.00	90.00
14				20.50	26.00	35.50	48.50	69.00	86.00	100.00
16				22.00	28.00	38.00	52.00	75.00	94.00	110.00
18						40.50	55.50	81.00	102.00	120.00

With Hexagon Nuts, 10 per cent extra.

COACH OR LAG SCREWS



FIG. 3451

SQUARE HEADS. PRICE PER 100

Length Under Head	$\frac{1}{4}$ & $\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{7}{8}$ & 1	$1\frac{1}{8}$	$1\frac{1}{4}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$
$1\frac{1}{2}$.....inches	\$2.25	\$2.70	\$3.15	\$3.75	.....	.....	.....	.....	.....	.....
2....."	2.45	2.96	3.47	4.11	\$6.00	.....	.....	.....	.....	.....
$2\frac{1}{4}$"	2.65	3.22	3.79	4.47	6.50	\$9.20	.....	.....	.....	.....
3....."	2.85	3.48	4.11	4.83	7.00	9.90	\$15.00	.....	.....	.....
$3\frac{1}{2}$"	3.05	3.74	4.43	5.19	7.50	10.60	16.00	\$22.00	.....	.....
4....."	3.25	4.00	4.75	5.55	8.00	11.30	17.00	23.30	.....	.....
$4\frac{1}{2}$"	3.45	4.26	5.07	5.91	8.50	12.00	18.00	24.60	.....	.....
5....."	3.65	4.52	5.39	6.27	9.00	12.70	19.00	25.90	\$36.00	.....
$5\frac{1}{2}$"	3.85	4.78	5.71	6.63	9.50	13.40	20.00	27.20	38.00	.....
6....."	4.05	5.04	6.03	6.99	10.00	14.10	21.00	38.50	40.00	\$56.00
$6\frac{1}{2}$....."	.....	.....	6.35	7.35	10.50	14.80	22.00	29.80	42.00	58.50
7....."	.....	.....	6.67	7.71	11.00	15.50	23.00	31.10	44.00	61.00
$7\frac{1}{2}$....."	.....	.....	6.99	8.07	11.50	16.20	24.00	32.40	46.00	63.50
8....."	.....	.....	7.31	8.43	12.00	16.90	25.00	33.70	48.00	66.00
9....."	.....	.....	7.95	9.15	13.00	18.30	27.00	36.30	52.00	71.00
10....."	.....	.....	.....	9.87	14.00	19.70	29.00	38.90	56.00	76.00
11....."	.....	.....	.....	10.59	15.00	21.10	31.00	41.50	60.00	81.00
12....."	.....	.....	.....	11.31	16.00	22.50	33.00	44.10	64.00	86.00

Screws with Hexagon Heads, 10% extra. Tee Head, 20% extra.



FIG. 3452

MACHINE BOLTS

WITH SQUARE HEADS AND SQUARE NUTS. FINISHED POINTS

LIST OF AUGUST 1ST, 1912

PRICE PER HUNDRED

Length Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{2}$	1 $\frac{3}{4}$
$\frac{3}{8}$, 1, 1 $\frac{1}{4}$ and 1 $\frac{1}{2}$	\$1.70	\$2.00	\$2.40	\$2.80	\$3.60	\$5.20	\$7.70	\$10.50	\$15.10	\$22.50	\$30.00	
2	1.78	2.12	2.56	3.00	3.86	5.58	8.25	11.20	16.00	23.70	31.50	
2 $\frac{1}{2}$	1.86	2.24	2.72	3.20	4.12	5.96	8.80	11.90	16.90	24.90	33.00	
3	1.94	2.36	2.88	3.40	4.38	6.34	9.35	12.60	17.80	26.10	34.50	
3 $\frac{1}{2}$	2.02	2.48	3.04	3.60	4.64	6.72	9.90	13.30	18.70	27.30	36.00	
4	2.10	2.60	3.20	3.80	4.90	7.10	10.45	14.00	19.60	28.50	37.50	
4 $\frac{1}{2}$	2.18	2.72	3.36	4.00	5.16	7.48	11.00	14.70	20.50	29.70	39.00	
5	2.26	2.84	3.52	4.20	5.42	7.86	11.55	15.40	21.40	30.90	40.50	
5 $\frac{1}{2}$	2.34	2.96	3.68	4.40	5.68	8.24	12.10	16.10	22.30	32.10	42.00	
6	2.42	3.08	3.84	4.60	5.94	8.62	12.65	16.80	23.20	33.30	43.50	
6 $\frac{1}{2}$	2.50	3.20	4.00	4.80	6.20	9.00	13.20	17.50	24.10	34.50	45.00	
7	2.58	3.32	4.16	5.00	6.46	9.38	13.75	18.20	25.00	35.70	46.50	
7 $\frac{1}{2}$	2.66	3.44	4.32	5.20	6.72	9.76	14.30	18.90	25.90	36.90	48.00	
8	2.74	3.56	4.48	5.40	6.98	10.14	14.85	19.60	26.80	38.10	49.50	
9	2.90	3.80	4.80	5.80	7.50	10.90	15.95	21.00	28.60	40.50	52.50	
10	3.06	4.04	5.12	6.20	8.02	11.66	17.05	22.40	30.40	42.90	55.50	
11	3.22	4.28	5.44	6.60	8.54	12.42	18.15	23.80	32.20	45.30	58.50	
12	3.38	4.52	5.76	7.00	9.06	13.18	19.25	25.20	34.00	47.70	61.50	
13			6.08	7.40	9.58	13.94	20.35	26.60	35.80	50.10	64.50	
14			6.40	7.80	10.10	14.70	21.45	28.00	37.60	52.50	67.50	
15			6.72	8.20	10.62	15.46	22.55	29.40	39.40	54.90	70.50	
16			7.04	8.60	11.14	16.22	23.65	30.80	41.20	57.30	73.50	
17					11.66	16.98	24.75	32.20	43.00	59.70	76.50	
18					12.18	17.74	25.85	33.60	44.80	62.10	79.50	
19					12.70	18.50	26.95	35.00	46.60	64.50	82.50	
20					13.22	19.26	28.05	36.40	48.40	66.90	85.50	
21							29.15	37.80	50.20	69.30	88.50	
22							30.25	39.20	52.00	71.70	91.50	
23							31.25	40.60	53.80	74.10	94.50	
24							32.45	42.00	55.60	76.50	97.50	
25							33.55	43.40	57.40	78.90	100.50	
26							34.65	44.80	59.20	81.30	103.50	
27							35.75	46.20	61.00	83.70	106.50	
28							36.85	47.60	62.80	86.10	109.50	
29							37.95	49.00	64.60	88.50	112.50	
30							39.05	50.40	66.40	90.90	115.50	
Advance per inch.	.16	.24	.32	.40	.52	.76	1.10	1.40	1.80	2.40	3.00	

The following extras are to be understood as a part of the Machine Bolt list.
Bolts with Hexagon Heads or Hexagon Nuts, 10 per cent extra.

If both Hexagon Heads and Hexagon Nuts, 20 per cent extra.

Bolts with U. S. Standard Hexagon Heads, 20 per cent extra.

Bolts with U. S. Standard Square Heads, 25 per cent extra.

Button Head Bolts, 25 per cent extra.

Countersunk Head Bolts, 25 per cent extra.

Bolts with T Heads, 50 per cent extra.

U. S. Standard Square Nuts, add 5 per cent.

U. S. Standard Hexagon Nuts, add 15 per cent.

Bolts furnished without nuts 5 per cent extra discount.

Intermediate lengths take list for next longer length.

MACHINE BOLTS

APPROXIMATE WEIGHT IN POUNDS OF 100 BOLTS OF SIZES ENUMERATED BELOW

Length	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$
$1\frac{1}{2}$	3.7	6.0	9.0	15.2	19.6	27.5	34.3	54.3	.....	.....	.....	.....
2	4.2	7.0	10.5	17.2	22.2	31.0	38.4	60.0	90.8	.....	.....	.....
$2\frac{1}{2}$	4.8	8.0	12.0	19.2	24.8	34.5	42.5	65.7	99.1	148.2	209.0	277.0
3	5.5	9.0	13.5	21.2	27.5	38.0	46.7	71.4	107.4	159.0	222.5	293.5
$3\frac{1}{2}$	6.1	10.0	15.0	23.2	30.1	41.5	50.8	77.1	115.7	169.8	236.0	310.0
4	6.8	11.0	16.5	25.2	32.8	45.0	55.0	82.8	124.0	180.6	249.5	326.5
$4\frac{1}{2}$	7.4	12.0	18.0	27.2	35.4	48.5	59.1	88.9	132.3	191.4	263.0	343.0
5	8.1	13.0	19.5	29.2	38.1	52.0	63.3	95.0	140.6	202.2	276.5	359.5
$5\frac{1}{2}$	8.7	14.0	21.0	31.2	40.7	55.5	67.4	101.1	148.9	213.0	290.0	376.0
6	9.4	15.0	22.5	33.2	43.4	59.0	71.6	107.2	157.2	223.8	303.5	392.5
$6\frac{1}{2}$	10.1	16.0	24.1	35.2	46.0	62.5	75.7	113.3	165.5	234.6	317.0	409.0
7	10.8	17.0	25.7	37.2	48.7	66.0	79.9	119.4	173.8	245.4	330.5	425.5
$7\frac{1}{2}$	11.5	18.0	27.3	39.2	51.3	69.5	84.0	125.5	182.1	256.2	344.0	442.0
8	12.2	19.0	28.9	41.2	54.0	73.0	88.2	131.6	190.4	267.0	357.5	458.5
9	.....	.....	32.1	45.2	59.5	80.0	96.5	143.8	207.0	288.6	385.5	493.0
10	.....	.....	35.3	49.2	65.0	87.0	104.8	156.0	223.6	310.2	413.5	527.5
11	.....	.....	38.5	53.2	70.5	94.0	113.1	168.2	240.2	331.8	441.5	562.0
12	.....	.....	41.7	57.2	76.0	101.0	121.4	180.4	256.8	353.4	469.5	596.5
13	.....	.....	.....	.....	81.5	108.0	129.7	192.6	273.4	375.0	497.5	631.0
14	.....	.....	.....	.....	87.0	115.0	138.0	204.8	290.0	396.6	525.5	665.5
15	.....	.....	.....	.....	92.5	122.0	146.3	217.0	306.6	418.2	553.5	700.0
16	.....	.....	.....	.....	98.0	129.0	154.6	229.2	323.2	439.8	581.5	734.5
17	.....	.....	.....	.....	103.5	136.0	162.9	241.4	339.8	461.4	609.5	769.0
18	.....	.....	.....	.....	109.0	143.0	171.2	253.6	356.4	483.0	637.5	803.5
19	.....	.....	.....	.....	114.5	150.0	179.5	265.8	373.0	504.6	665.5	838.0
20	.....	.....	.....	.....	120.0	157.0	187.8	278.0	389.6	526.2	693.5	872.5
21	.....	.....	.....	.....	.....	.....	.....	290.4	406.5	548.2	721.5	907.0
22	.....	.....	.....	.....	.....	.....	.....	302.8	423.4	570.2	749.5	941.5
23	.....	.....	.....	.....	.....	.....	.....	315.2	440.3	592.2	777.5	976.0
24	.....	.....	.....	.....	.....	.....	.....	327.6	457.2	614.2	805.5	1010.5
25	.....	.....	.....	.....	.....	.....	.....	340.0	474.1	636.2	833.5	1045.0
26	.....	.....	.....	.....	.....	.....	.....	352.4	491.0	658.2	861.5	1079.5
27	.....	.....	.....	.....	.....	.....	.....	364.8	507.9	680.2	889.5	1114.0
28	.....	.....	.....	.....	.....	.....	.....	377.2	524.8	702.2	917.5	1148.5
29	.....	.....	.....	.....	.....	.....	.....	389.6	541.7	724.2	945.5	1183.0
30	.....	.....	.....	.....	.....	.....	.....	402.0	558.6	746.2	973.5	1217.5

TABLE SHOWING U. S. STANDARD NUMBER OF
THREADS TO AN INCH

Diameter	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$
No. Threads.....	20	18	16	14	13	12	11	10
Diameter	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{7}{8}$	$1\frac{3}{4}$
No. Threads.....	9	8	7	6	5	4	3	2
Diameter	$1\frac{1}{2}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$
No. Threads.....	5	$4\frac{1}{2}$	$4\frac{1}{2}$	4	4	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{4}$

The Threads of all Machine Bolts, Bolt Ends, and Railroad Track Bolts are generally cut to above standard.

APPROXIMATE NUMBER OF MACHINE BOLTS

PACKED IN CASES AND KEGS

CASES

Size	$\frac{1}{4}$ Inch	$\frac{5}{16}$ Inch	$\frac{3}{8}$ Inch	Size	$\frac{1}{4}$ Inch	$\frac{5}{16}$ Inch	$\frac{3}{8}$ Inch
$\frac{1}{2}$	12,600	10,500		3	5,000	3,500	2,200
$\frac{5}{8}$	12,600	10,000		$3\frac{1}{4}$	5,000	3,500	2,000
$\frac{3}{4}$	12,600	10,000	6,000	$3\frac{1}{2}$	5,000	3,500	2,000
$\frac{7}{8}$	12,600			$3\frac{3}{4}$	4,000	2,200	2,000
1	12,600	7,000	5,000	4	4,000	2,500	2,000
$1\frac{1}{4}$	11,000	7,000	5,000	$4\frac{1}{4}$	4,000	2,000	2,000
$1\frac{1}{2}$	10,000	6,000	4,000	$4\frac{1}{2}$	4,000	2,000	2,000
$1\frac{3}{4}$	9,000	6,000	4,000	$4\frac{3}{4}$	4,000	2,000	2,000
2	9,000	5,000	3,500	5	4,000	2,000	2,000
$2\frac{1}{4}$	7,000	4,500	3,500	$5\frac{1}{2}$	3,400	1,700	1,600
$2\frac{1}{2}$	7,000	4,000	3,000	6	3,400	1,700	1,600
$2\frac{3}{4}$	5,000	3,500	3,000				

KEGS

Size	$\frac{1}{2}$ Inch	$\frac{5}{8}$ Inch	$\frac{3}{4}$ Inch	$\frac{7}{8}$ Inch	1 Inch	Size	$\frac{1}{2}$ Inch	$\frac{5}{8}$ Inch	$\frac{3}{4}$ Inch	$\frac{7}{8}$ Inch	1 Inch
1	1,500	850				5	450	300	200	150	100
$1\frac{1}{4}$	1,400	800	500			$5\frac{1}{2}$	450	250	175	125	100
$1\frac{1}{2}$	1,300	750	500	300		6	400	250	175	125	100
$1\frac{3}{4}$	1,250	700	450	300		$6\frac{1}{2}$	350	225	160	125	90
2	1,150	650	450	275	175	7	350	225	150	100	80
$2\frac{1}{4}$	1,000	600	400	250	175	$7\frac{1}{2}$	325	200	150	100	75
$2\frac{1}{2}$	1,000	600	400	250	175	8	300	200	140	100	75
$2\frac{3}{4}$	900	550	375	250	160	$8\frac{1}{2}$	275	175	125	100	70
3	800	500	325	225	150	9	250	175	125	100	70
$3\frac{1}{4}$	700	450	300	200	150	10	250	150	100	100	60
$3\frac{1}{2}$	700	400	275	200	135	11	225	125	100	75	50
$3\frac{3}{4}$	600	375	250	200	125	12	200	125	100	75	50
4	600	350	250	175	125	13	200	125	100	75	50
$4\frac{1}{4}$	550	350	250	175	125	14	200	125	100	50	50
$4\frac{1}{2}$	500	325	225	150	125	15	200	100	100	50	50
$4\frac{3}{4}$	500	300	225	150	100	16	200	100	100	50	50

COMMON CARRIAGE BOLTS

WITH SHORT FULL SIZE SQUARE UNDERHEADS, FORGED NUT
AND FINISHING POINTS



FIG. 3453

MANUFACTURERS' STANDARD LIST

Price per hundred.

Revised November 1, 1912.

Length, Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{5}{8}$ and $\frac{3}{4}$	$\frac{1}{2}$
1½	\$1.00	\$1.40	\$1.90	\$2.20	.....	.....	.....
2	1.10	1.52	2.06	2.40	.....	.....	.....
2½	1.20	1.64	2.22	2.60	\$3.25	\$5.75	\$8.50
3	1.30	1.76	2.38	2.80	3.53	6.13	9.00
3½	1.40	1.88	2.54	3.00	3.81	6.51	9.50
4	1.50	2.00	2.70	3.20	4.09	6.89	10.00
4½	1.60	2.12	2.86	3.40	4.37	7.27	10.50
5	1.70	2.24	3.02	3.60	4.65	7.65	11.00
5½	1.80	2.36	3.18	3.80	4.93	8.03	11.50
6	1.90	2.48	3.34	4.00	5.21	8.41	12.00
6½	2.00	2.60	3.50	4.20	5.49	8.79	12.50
7	2.10	2.72	3.66	4.40	5.77	9.17	13.00
7½	2.20	2.84	3.82	4.60	6.05	9.55	13.50
8	2.30	2.96	3.98	4.80	6.33	9.93	14.00
8½	2.40	3.08	4.14	5.00	6.61	10.31	14.50
9	2.50	3.20	4.30	5.20	6.89	10.69	15.00
9½	2.60	3.32	4.46	5.40	7.17	11.07	15.50
10	2.70	3.44	4.62	5.60	7.45	11.45	16.00
11	2.90	3.68	4.94	6.00	8.01	12.21	17.00
12	3.10	3.92	5.26	6.40	8.57	12.97	18.00
13	3.30	4.16	5.58	6.80	9.13	13.73	19.00
14	3.50	4.40	5.90	7.20	9.69	14.49	20.00
15	3.70	4.64	6.22	7.60	10.25	15.25	21.00
16	3.90	4.88	6.54	8.00	10.81	16.01	22.00
17	4.10	5.12	6.86	8.40	11.37	16.77	23.00
18	4.30	5.36	7.18	8.80	11.93	17.53	24.00
19	4.50	5.60	7.50	9.20	12.49	18.29	25.00
20	4.70	5.84	7.82	9.60	13.05	19.05	26.00

Intermediate lengths, take list of the next longer length.

Carriage bolts, when fitted with hexagon nuts, 15 per cent extra.

Broken packages to be charged extra

CARRIAGE BOLTS

APPROXIMATE WEIGHTS IN POUNDS OF 100 BOLTS OF SIZES
ENUMERATED BELOW

Length, Inches	Diameter, Inches								
	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$
1	Lbs. 1	Lbs. 2	Lbs. 4	Lbs. 6	Lbs. 9	Lbs. 14	Lbs. 21	Lbs. 28	Lbs. 45
$1\frac{1}{4}$	$1\frac{1}{8}$	3	5	7	10	15	22	30	47
$1\frac{1}{2}$	2	$3\frac{1}{4}$	$5\frac{1}{2}$	8	11	17	24	32	49
$1\frac{3}{4}$	$2\frac{1}{8}$	$3\frac{1}{2}$	6	9	12	18	26	34	52
2	$2\frac{1}{4}$	4	$6\frac{1}{2}$	$9\frac{1}{2}$	15	20	28	36	55
$2\frac{1}{4}$	$2\frac{1}{2}$	$4\frac{1}{4}$	7	10	14	21	29	38	57
$2\frac{1}{2}$	$2\frac{1}{2}$	$4\frac{1}{2}$	$7\frac{1}{4}$	11	15	22	31	40	60
$2\frac{3}{4}$	3	5	$7\frac{1}{2}$	$11\frac{1}{2}$	16	24	33	42	63
$2\frac{1}{2}$	$3\frac{1}{8}$	$5\frac{1}{4}$	8	12	17	25	34	44	66
$3\frac{1}{4}$	$3\frac{1}{4}$	$5\frac{1}{2}$	$8\frac{1}{2}$	13	18	26	36	46	69
$3\frac{1}{2}$	$3\frac{3}{8}$	$5\frac{3}{4}$	9	$13\frac{1}{2}$	19	28	38	48	72
$3\frac{3}{4}$	$3\frac{1}{2}$	6	$9\frac{1}{2}$	14	20	29	39	50	74
4	4	$6\frac{1}{2}$	10	15	21	31	41	52	77
$4\frac{1}{4}$	$4\frac{1}{8}$	$6\frac{3}{4}$	$10\frac{1}{2}$	16	22	32	43	54	80
$4\frac{1}{2}$	$4\frac{1}{8}$	7	11	$16\frac{1}{2}$	23	33	44	56	83
$4\frac{3}{4}$	$4\frac{1}{2}$	$7\frac{1}{4}$	$11\frac{1}{2}$	17	24	35	46	58	86
5	5	$7\frac{1}{2}$	12	18	25	36	48	60	90
$5\frac{1}{4}$	$5\frac{1}{8}$	$8\frac{1}{4}$	$12\frac{1}{2}$	19	27	39	51	64	96
$5\frac{1}{2}$	$5\frac{1}{4}$	8	$12\frac{1}{2}$	19	27	39	51	64	96
$5\frac{3}{4}$	$5\frac{1}{2}$								
6	6	9	13	20	29	42	55	68	102
$6\frac{1}{4}$	$6\frac{1}{8}$	$9\frac{1}{2}$	14	21	31	44	58	72	108
$6\frac{1}{2}$	$6\frac{1}{4}$								
$6\frac{3}{4}$	$6\frac{1}{2}$	10	15	23	33	47	61	76	114
7	7								
$7\frac{1}{2}$	$7\frac{1}{2}$	$10\frac{1}{2}$	16	25	35	50	65	80	120
8	8	11	17	26	37	53	68	84	126
$8\frac{1}{2}$	$8\frac{1}{2}$	12	18	27	39	55	71	88	132
9	9	$12\frac{1}{2}$	19	29	41	58	75	92	138
$9\frac{1}{2}$	$9\frac{1}{2}$	13	20	30	43	61	78	96	144
10	10	14	21	32	45	64	82	100	151
$10\frac{1}{2}$	$10\frac{1}{2}$								
11	11	15	22	34	49	69	88	108	163
12	12	16	24	37	53	75	95	116	175
13	13	17	26	40	56	80	102	124	187
14	$13\frac{1}{2}$	18	28	42	60	86	109	132	199
15	14	20	30	45	64	92	115	140	212
16	15	21	31	48	68	98	122	148	224
17	16	22	32	51	72	102	129	156	236
18	17	23	35	53	76	108	136	164	248
19	18	24	37	56	80	113	143	172	260
20	19	26	39	59	84	119	150	180	273

APPROXIMATE NUMBER OF CARRIAGE BOLTS

PACKED IN CASES AND KEGS

CASES

Size	$\frac{1}{4}$ Inch	$\frac{1}{2}$ Inch	$\frac{3}{4}$ Inch	Size	$\frac{1}{4}$ Inch	$\frac{1}{2}$ Inch	$\frac{3}{4}$ Inch
1	12,600	7,000	5,000	3 $\frac{3}{4}$	4,000	2,500	2,000
1 $\frac{1}{4}$	11,000	7,000	4,600	4	4,000	2,500	2,000
1 $\frac{1}{2}$	10,000	6,000	4,000	4 $\frac{1}{4}$	4,000	2,500	2,000
1 $\frac{3}{4}$	9,000	5,000	4,000	4 $\frac{1}{2}$	4,000	2,500	2,000
2	7,000	5,000	3,500	4 $\frac{3}{4}$	4,000	2,000	2,000
2 $\frac{1}{4}$	7,000	4,000	3,000	5	4,000	2,000	1,600
2 $\frac{1}{2}$	7,000	4,000	3,000	5 $\frac{1}{4}$	3,400	1,700	1,600
2 $\frac{3}{4}$	7,000	3,500	2,500	5 $\frac{1}{2}$	3,400	1,700	1,500
3	5,000	3,500	2,000	5 $\frac{3}{4}$	3,200	1,600	1,200
3 $\frac{1}{4}$	5,000	3,000	2,000	6	3,200	1,600	1,200
3 $\frac{1}{2}$	4,000	3,000	2,000				

KEGS

Size	$\frac{1}{2}$ Inch	$\frac{3}{4}$ Inch	$\frac{1}{4}$ Inch	Size	$\frac{1}{2}$ Inch	$\frac{3}{4}$ Inch	$\frac{1}{4}$ Inch
1 $\frac{1}{4}$	1,400			4 $\frac{1}{4}$	550	350	250
1 $\frac{1}{2}$	1,300	750		4 $\frac{1}{2}$	500	325	225
1 $\frac{3}{4}$	1,200	750		4 $\frac{3}{4}$	500	325	225
2	1,100	600	400	5	450	300	200
2 $\frac{1}{4}$	1,000	600	400	5 $\frac{1}{2}$	400	275	175
2 $\frac{1}{2}$	900	550	375	6	400	250	175
2 $\frac{3}{4}$	800	500	350	6 $\frac{1}{2}$	350	225	150
3	800	500	325	7	350	225	150
3 $\frac{1}{4}$	700	450	300	7 $\frac{1}{2}$	350	200	150
3 $\frac{1}{2}$	700	425	250	8	300	200	125
3 $\frac{3}{4}$	650	400	250	9	250	175	125
4	600	375	250	10	250	150	125

PHILADELPHIA EAGLE CARRIAGE BOLTS

TURNED HEADS—U. S. S. CUT THREADS

Bevel Head



FIG. 3454

Oval Head



FIG. 3455

Countersunk Head



FIG. 3456

Bastard Head



FIG. 3457

SIZES OF OVAL HEADS ON EAGLE CARRIAGE BOLTS

Diameter	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$
Width	$\frac{7}{16}$	$\frac{5}{8}$	$\frac{11}{16}$	$\frac{13}{16}$	$1\frac{1}{16}$	$1\frac{1}{4}$	$1\frac{5}{8}$	$1\frac{7}{8}$	$2\frac{1}{8}$
Thick	$\frac{3}{32}$	$\frac{1}{16}$	$\frac{3}{32}$	$\frac{1}{4}$	$\frac{5}{32}$	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{1}{2}$

SIZES OF SQUARE NUTS ON EAGLE CARRIAGE BOLTS

Width	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{4}$	$2\frac{1}{4}$
Thick	$\frac{1}{16}$	$\frac{3}{32}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$1\frac{1}{8}$	$1\frac{1}{2}$

For prices, see following page.

PHILADELPHIA EAGLE CARRIAGE BOLTS—CONTINUED

Manufacturers' Standard List, in effect May 24, 1899.

LIST PRICE PER HUNDRED

Diameter Length	$\frac{3}{16}$ & $\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$ & $\frac{5}{8}$	$\frac{3}{4}$
1	\$3.00	\$4.00	\$5.40	\$7.30	\$9.50	.....	.....
1 $\frac{1}{4}$	3.10	4.00	5.40	7.30	9.50	.....	.....
1 $\frac{1}{2}$	3.20	4.00	5.40	7.30	9.50	.....	.....
1 $\frac{3}{4}$	3.30	4.00	5.40	7.50	9.80	.....	.....
2	3.40	4.10	5.40	7.70	10.10	\$16.75	.....
2 $\frac{1}{4}$	3.50	4.20	5.60	7.90	10.35	17.25	.....
2 $\frac{1}{2}$	3.60	4.40	5.80	8.15	10.65	17.75	.....
2 $\frac{3}{4}$	3.70	4.50	6.00	8.35	10.90	18.25	.....
3	3.80	4.70	6.20	8.55	11.20	18.75	\$21.50
3 $\frac{1}{4}$	3.90	4.90	6.50	8.75	11.50	19.25	22.35
3 $\frac{1}{2}$	4.00	5.00	6.70	8.95	11.75	19.75	23.25
3 $\frac{3}{4}$	4.10	5.20	6.90	9.15	12.00	20.25	24.50
4	4.20	5.30	7.10	9.40	12.30	20.75	25.00
4 $\frac{1}{4}$	4.35	5.50	7.30	9.60	12.60	21.25	26.85
4 $\frac{1}{2}$	4.50	5.70	7.50	9.80	12.90	21.75	27.80
4 $\frac{3}{4}$	4.65	5.85	7.70	10.00	13.15	22.25	28.30
5	4.80	6.00	7.90	10.25	13.45	22.75	28.75
5 $\frac{1}{2}$	5.10	6.30	8.40	10.65	14.00	23.75	30.50
6	5.40	6.60	8.80	11.05	14.55	24.75	32.50
6 $\frac{1}{2}$	.....	7.00	9.30	11.50	15.10	25.75	33.50
7	.....	7.30	9.70	11.85	15.70	26.75	36.25
7 $\frac{1}{2}$	.....	7.60	10.10	12.35	16.25	27.75	38.00
8	.....	7.90	10.50	12.75	16.80	28.75	40.00
8 $\frac{1}{2}$	.....	8.20	10.90	13.15	17.35	29.75	42.00
9	.....	8.50	11.40	13.60	17.90	30.75	43.75
9 $\frac{1}{2}$	.....	.....	11.90	14.00	18.50	31.75	45.75
10	.....	.....	12.40	14.45	19.00	32.75	47.50
10 $\frac{1}{2}$	.....	.....	.....	14.85	19.60	33.75	49.30
11	.....	.....	.....	15.25	20.15	34.75	51.25
11 $\frac{1}{2}$	.....	.....	.....	15.70	20.70	35.75	53.00
12	.....	.....	.....	16.15	21.30	36.75	55.00

For intermediate lengths, use List Price of next longer length.

Hexagon Nuts, 15 per cent extra.

NO. OF THREADS PER INCH

Diameter	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$
	24	20	18	16	14	13	12	11	10

STOVE BOLTS

Flat Head



FIG. 3458

Round Head



FIG. 3459

FLAT OR ROUND HEAD, PRICE PER 100

Length, Inches	Diameter, Inches				
	$\frac{1}{8}$ and $\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$ and $\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$
$\frac{3}{8}$	\$0.85	\$0.85	.....	.....	.....
$\frac{1}{2}$	.85	.85	\$1.20	.....	.....
$\frac{5}{8}$	.85	.85	1.20	.....	.....
$\frac{3}{4}$	.85	.85	1.20	\$1.75	\$2.65
$\frac{7}{8}$	.90	.90	1.25	1.80	2.70
1	.90	.90	1.30	1.85	2.75
$1\frac{1}{8}$	.95	.95	1.35	1.90	2.85
$1\frac{1}{4}$	1.00	1.00	1.40	1.95	2.90
$1\frac{3}{8}$	1.05	1.05	1.45	2.00	3.00
$1\frac{1}{2}$	1.10	1.10	1.50	2.05	3.10
$1\frac{3}{4}$	1.15	1.15	1.55	2.15	3.20
2	1.20	1.20	1.60	2.30	3.40
$2\frac{1}{4}$	.....	1.25	1.70	2.40	3.60
$2\frac{1}{2}$	.....	1.30	1.80	2.50	3.80
$2\frac{3}{4}$	.....	1.40	1.90	2.60	4.00
3	.....	1.50	2.00	2.70	4.20
$3\frac{1}{4}$	.....	1.60	2.10	2.85	4.40
$3\frac{1}{2}$	.....	1.70	2.20	3.00	4.60
$3\frac{3}{4}$	.....	1.80	2.30	3.15	4.80
4	.....	1.90	2.40	3.30	5.00
$4\frac{1}{4}$	.....	2.00	2.50	3.45	5.20
$4\frac{1}{2}$	.....	2.10	2.60	3.60	5.40
$4\frac{3}{4}$	.....	2.20	2.70	3.75	5.60
5	.....	2.30	2.85	3.90	5.80
$5\frac{1}{4}$	.....	2.40	3.00	4.10	6.00
$5\frac{1}{2}$	.....	2.50	3.15	4.30	6.20
$5\frac{3}{4}$	.....	2.60	3.30	4.50	6.40
6	.....	2.75	3.45	4.70	6.60
$6\frac{1}{4}$	.....	2.90	3.60	4.90	6.80
$6\frac{1}{2}$	.....	3.05	3.75	5.10	7.00

Nickel-plating, extra per hundred, \$1.00.

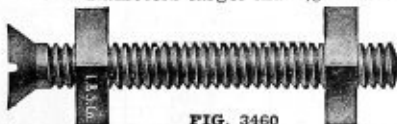
All diameters larger than $\frac{3}{8}$ -inch same list as Philadelphia Eagle Carriage Bolts

FIG. 3460

SINK BOLTS
WITH TWO SQUARE NUTS

LIST PRICE PER 100

Length .....inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3
$\frac{1}{4}$ -inch Diameter	\$1.70	1.80	1.90	2.00	2.10	2.20	2.30	2.40	2.50

Nickel-plating, \$1.00 extra per hundred, added to List Price.

TIRE BOLTS

Plain Pattern

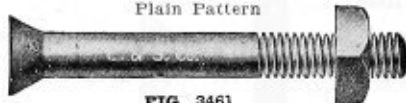


FIG. 3461

Ribbed Pattern



FIG. 3462

Manufacturers' Standard List, in effect December 28, 1899

LIST PRICE PER HUNDRED

Diameter Length	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$
1	\$0.60	.60	.95	1.40	2.20
1 $\frac{1}{4}$	.60	.60	.95	1.40	2.20
1 $\frac{1}{2}$	.60	.60	.95	1.40	2.20
1 $\frac{3}{4}$	.65	.65	1.00	1.40	2.20
2	.70	.70	1.05	1.47	2.20
2 $\frac{1}{4}$	.75	.75	1.10	1.54	2.30
2 $\frac{1}{2}$	.80	.80	1.15	1.61	2.40
2 $\frac{3}{4}$	.85	.85	1.20	1.68	2.50
3	.90	.90	1.25	1.75	2.60
3 $\frac{1}{4}$	.95	.95	1.30	1.82	2.70
3 $\frac{1}{2}$	1.00	1.00	1.35	1.89	2.80
3 $\frac{3}{4}$	1.05	1.05	1.40	1.96	2.90
4	1.10	1.10	1.45	2.03	3.00
4 $\frac{1}{4}$	1.15	1.15	1.50	2.10	3.10
4 $\frac{1}{2}$	1.20	1.20	1.55	2.17	3.20
4 $\frac{3}{4}$	1.25	1.25	1.60	2.24	3.30
5	1.30	1.30	1.65	2.31	3.40
5 $\frac{1}{4}$	1.35	1.35	1.70	2.38	3.50
5 $\frac{1}{2}$	1.40	1.40	1.75	2.45	3.60
5 $\frac{3}{4}$	1.45	1.45	1.80	2.52	3.70
6	1.50	1.50	1.85	2.59	3.80

Hexagon Nuts 15 per cent extra.

Diameter	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$
Width of Head	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$

SIZES OF SQUARE NUTS ON TIRE BOLTS

Width	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$
Thick	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$

CONTENTS OF FULL CASES OF TIRE BOLTS

Diameter $\frac{3}{16}$ Inch			Diameter $\frac{1}{4}$ Inch		
Length	Number in Case	Weight	Length	Number in Case	Weight
1 $\frac{1}{2}$	10,000	205	1 $\frac{1}{2}$	5,400	156
1 $\frac{3}{4}$	14,000	305	1 $\frac{3}{4}$	5,000	168
2	10,000	256	2	9,000	305
2 $\frac{1}{4}$	10,000	275	2 $\frac{1}{4}$	8,000	217
2 $\frac{1}{2}$	5,000	110	2 $\frac{1}{2}$	6,000	211
...	.....	...	2 $\frac{3}{4}$	5,000	223
...	.....	...	3	5,000	238

MILLED COUPLING BOLTS



FIG. 3463

The bodies of these bolts are milled, and their heads and nuts faced true with body.

PRICE PER HUNDRED

Diameter of Head....inches		$\frac{7}{8}$	$1\frac{1}{16}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	2
Length " " " "		$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$
Diameter " Bolt " " "		$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$
Length under Head to Extreme Point.	2 inches	\$20.00	\$25.00	.....	.....	.....	.....	.....
	$2\frac{1}{4}$ "	20.50	25.75	\$32.00	.....	.....	.....	.....
	$2\frac{1}{2}$ "	21.00	26.50	32.00	\$38.75	.....	.....	.....
	$2\frac{3}{4}$ "	21.50	27.25	33.00	39.75	\$56.00	.....	.....
	3 "	22.00	28.00	34.00	40.75	56.00	\$70.00	.....
	$3\frac{1}{4}$ "	22.50	28.75	35.00	41.75	57.00	71.50	\$100.00
	$3\frac{1}{2}$ "	23.00	29.50	36.00	42.75	58.00	73.00	100.00
	$3\frac{3}{4}$ "	23.50	30.25	37.00	43.75	59.00	74.50	102.50
	4 "	24.00	31.00	38.00	44.75	60.00	76.00	105.00
	$4\frac{1}{4}$ "	24.50	31.75	39.00	45.75	61.00	77.50	107.50
	$4\frac{1}{2}$ "	25.00	32.50	40.00	46.75	62.00	79.00	110.00
	$4\frac{3}{4}$ "	25.50	33.25	41.00	47.75	63.00	80.50	112.50
	5 "	.....	34.00	42.00	48.75	64.00	82.00	115.00
	$5\frac{1}{4}$ "	.....	.....	43.00	49.75	65.00	83.50	117.50
	$5\frac{1}{2}$ "	.....	.....	.....	50.75	66.00	85.00	120.00
	$5\frac{3}{4}$ "	.....	.....	.....	.....	67.00	86.50	122.50
	6 "	.....	.....	.....	.....	.....	88.00	125.00
Thickness of Nut....inches		$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$
Short Diam. of Nut, inches		$\frac{7}{8}$	$1\frac{1}{16}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	2

BOLT ENDS
WITH SQUARE NUTS

FIG. 3464

LIST OF OCTOBER 1ST, 1909

Size of iron	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Length in inches....	6	7	7	8	9	10	11	12	13	14
Cents per pound....	20	18	16	14	12	10	10	10	10	11
Weight per 100 Bolts	15	22	31	45	80	130	200	310	410	545
Size of iron	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	$1\frac{7}{8}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3
Length in inches....	15	16	17	18	19	20	22	24	24	26
Cents per pound....	11	11	12	12	12	12	14	14	16	18
Weight per 100 Bolts	700	910	1120	1400	1710	2050	2880	3800	4860	6454

The following extras are to be understood as a part of this list:

With Hexagon Nuts, 10 per cent. extra.

Bolt Ends ordered shorter than above standard lengths in lots of 100 or over, will be charged at the price per hundred of Machine Bolts of same length, subject to same discount, in smaller lots extra.

PLANER HEAD BOLTS

PRICE PER 100 WITHOUT NUTS. (IRON)



FIG. 3465

Diameter of head...inches	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{2}$	$1\frac{3}{4}$
Length of head.....inch	$\frac{5}{16}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{7}{16}$
Diameter of screw....inch	$\frac{1}{2}$	$\frac{5}{16}$	$\frac{5}{8}$	$1\frac{1}{16}$	$\frac{3}{4}$
Length under head to extreme point in inches...	$\left\{ \begin{array}{l} 1 \\ 1\frac{1}{4} \\ 1\frac{1}{2} \\ 1\frac{3}{4} \\ 2 \end{array} \right.$	$\left\{ \begin{array}{l} 12.50 \\ 13.25 \\ 13.25 \\ 15.25 \\ 17.25 \end{array} \right.$	$\left\{ \begin{array}{l} 15.00 \\ 15.25 \\ 15.50 \\ 18.50 \\ 19.75 \end{array} \right.$	$\left\{ \begin{array}{l} 16.75 \\ 17.50 \\ 18.50 \\ 18.50 \\ 19.75 \end{array} \right.$	$\left\{ \begin{array}{l} 21.25 \\ 22.00 \\ 22.50 \\ 22.50 \\ 23.75 \end{array} \right.$
Threads to inch	12	12	11	11	10

PLANER HEAD BOLT WASHERS



FIG. 3466

Diameter, Inches	Thickness, Inches	For Planer Head-Bolts	Price Per 100
$1\frac{7}{16}$	$\frac{1}{16}$	$\frac{1}{2}$	\$3.00
$1\frac{1}{2}$	$\frac{1}{16}$	$\frac{9}{16}$	3.00
$1\frac{3}{4}$	$\frac{1}{16}$	$\frac{5}{8}$	3.50
$1\frac{5}{8}$	$\frac{1}{16}$	$1\frac{1}{16}$	4.00
$1\frac{3}{4}$	$\frac{1}{16}$	$\frac{3}{4}$	4.50

PLANER HEAD BOLT NUTS

HEXAGON, CASE HARDENED



FIG. 3467

Diameter of Screw, Inches	Short Diameter of Nuts, Inches	Thickness of Nuts, Inches	Price Per 100
$\frac{1}{2}$	$1\frac{1}{8}$	$\frac{3}{8}$	\$10.00
$\frac{9}{16}$	$1\frac{1}{8}$	$\frac{3}{8}$	12.00
$\frac{5}{8}$	$1\frac{1}{8}$	$\frac{3}{8}$	17.50
$1\frac{1}{16}$	$1\frac{1}{4}$	$\frac{3}{8}$	24.00
$\frac{3}{4}$	$1\frac{1}{16}$	$\frac{1}{2}$	24.00

All 12 threads to the inch, unless otherwise specified.

BOILER PATCH BOLTS

TURNED AND THREADED

PRICE PER 100

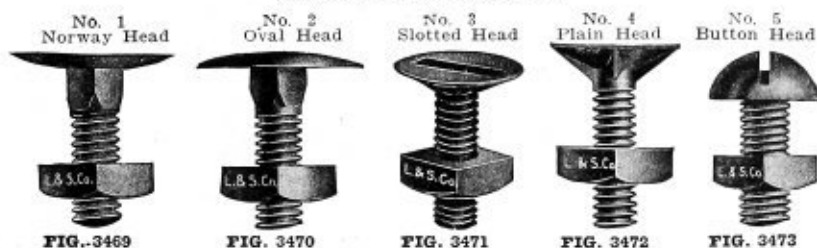


FIG. 3468

Length, Inches*	Diameter, Inches				
	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
$\frac{3}{4}$	\$3.75	\$4.25	.....	.....	.....
$\frac{7}{8}$	4.00	4.50	\$6.00	.....	.....
1	4.25	4.80	6.50	\$9.50	\$13.50
$1\frac{1}{8}$	4.50	5.10	6.80	9.85	14.00
$1\frac{1}{4}$	4.75	5.50	7.25	10.25	14.75
$1\frac{1}{2}$	5.25	6.50	8.25	11.25	16.25
Threads to inch.....	12	12	12	12	12

*From largest diameter of bevel point.

ELEVATOR BOLTS



Manufacturers' Standard List, in effect April 1, 1913.

LIST PRICE PER HUNDRED

Diameter Length	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$
$\frac{3}{4}$	\$2.20	2.20	3.00	4.00
$\frac{7}{8}$	2.30	2.30	3.00	4.00
1	2.30	2.30	3.00	4.00
$1\frac{1}{4}$	2.40	2.40	3.20	4.30
$1\frac{1}{2}$	2.50	2.50	3.40	4.60
$1\frac{3}{4}$	2.60	2.60	3.60	4.90
2	2.70	2.70	3.80	5.20
$2\frac{1}{4}$	2.80	2.80	4.00	5.50
$2\frac{1}{2}$	2.90	2.90	4.20	5.80

SIZES OF HEADS

No. 1	$\frac{5}{16} \times \frac{1}{16}$	$1 \times \frac{1}{4}$	$1\frac{1}{16} \times \frac{3}{8}$	$1\frac{1}{4} \times \frac{1}{8}$
No. 2	$\frac{3}{4} \times \frac{1}{2}$	$\frac{7}{8} \times \frac{1}{8}$	$1\frac{1}{2} \times \frac{3}{4}$	$1\frac{1}{8} \times \frac{1}{2}$
No. 3	$\frac{5}{8} \times \frac{3}{4}$	$\frac{3}{4} \times \frac{1}{2}$	$1\frac{1}{2} \times \frac{1}{2}$	.....
No. 4	$\frac{5}{8} \times \frac{3}{4}$	$\frac{3}{4} \times \frac{1}{2}$	$1\frac{1}{2} \times \frac{1}{2}$	.....
No. 5	$\frac{1}{16} \times \frac{3}{8}$	$\frac{1}{4} \times \frac{1}{8}$	$\frac{1}{4} \times \frac{3}{8}$	$\frac{1}{2} \times \frac{1}{4}$

SIZES OF SQUARE NUTS ON ELEVATOR BOLTS

Width	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
Thick	$\frac{1}{16}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$

ALL Elevator Bolts are measured from under head to point of bolt.

BOILER STAY BOLTS



FIG. 3474
PRICE PER 100

Diameter, Inches	Length Under Head, Inches											Longer Than 12 Inches, Per Lb.
	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	7	8	9	10	11	12	
$\frac{3}{4}$	16.45	17.20	17.95	18.70	19.45	20.95	22.50	24.00	25.50	27.00	28.50	$22\frac{1}{2}$
$\frac{1}{2}$ and $\frac{7}{8}$	23.80	24.80	25.80	26.80	27.80	29.80	31.80	33.80	35.80	37.80	39.80	.21
$\frac{1}{8}$ and 1	30.00	31.25	32.50	33.75	35.00	37.50	40.00	42.50	45.00	47.50	50.00	.20
$1\frac{1}{16}$ and $1\frac{1}{8}$	39.00	40.50	42.00	43.50	45.00	48.00	51.00	54.00	57.00	60.00	63.00	.20
$1\frac{1}{4}$	48.00	50.00	52.00	54.00	56.00	60.00	64.00	68.00	72.00	76.00	80.00	.20

MILLED IRON STUD BOLTS
WITHOUT NUTS

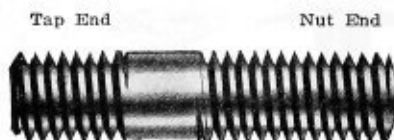


FIG. 3475

1. All Studs made to order only.
2. Studs with round or square collars, and plain studs with rough centers are special. Price quoted on specification.
3. Steel studs take 25 per cent advance over iron.
4. In ordering give length over all and the length of thread on each end.
5. All studs are made steam tight on tap end unless otherwise specified.

LENGTH OF THREADS ON REGULAR STUDS

N = Nut End.

T = Tap End

[illegible]

STUD BOLTS

Rough

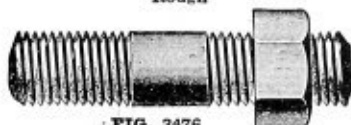


FIG. 3476

Milled

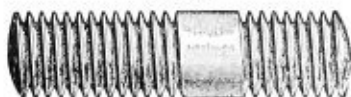


FIG. 3477

ROUGH, WITH COLD PUNCHED CHAMFERED AND TRIMMED
HEXAGON NUTS. PRICE PER HUNDRED

Diameter..Inches	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$
Length $1\frac{1}{4}$ inches	\$4.00	\$5.10	\$5.50	.....	.....	.....	.....	.....	.....	.....
" $1\frac{3}{4}$ "	4.10	5.25	5.65	.....	.....	.....	.....	.....	.....	.....
" 2 "	4.20	5.40	5.80	\$8.50	\$8.50	\$12.40	.....	.....	.....	.....
" $2\frac{1}{4}$ "	4.30	5.55	5.95	8.75	8.75	12.70	.....	.....	.....	.....
" $2\frac{1}{2}$ "	4.40	5.70	6.10	9.00	9.00	13.00	\$18.00	.....	.....	.....
" $2\frac{3}{4}$ "	4.50	5.85	6.25	9.25	9.25	13.30	18.50	.....	.....	.....
" 3 "	4.60	6.00	6.40	9.50	9.50	13.60	19.00	\$27.80	.....	.....
" $3\frac{1}{4}$ "	4.70	6.15	6.55	9.75	9.75	13.90	19.50	28.40	.....	.....
" $3\frac{1}{2}$ "	4.80	6.30	6.70	10.00	10.00	14.20	20.00	29.00	.....	.....
" $3\frac{3}{4}$ "	4.90	6.45	6.85	10.25	10.25	14.50	20.50	29.60	.....	.....
" 4 "	5.00	6.60	7.00	10.50	10.50	14.80	21.00	30.20	\$45.00	\$64.00
" $4\frac{1}{2}$ "	5.25	6.90	7.30	11.00	11.00	15.40	22.00	31.40	46.50	66.50
" 5 "	6.00	7.60	8.00	11.50	11.50	16.00	23.00	32.60	48.00	69.00
" $5\frac{1}{2}$ "	7.25	8.00	8.00	12.00	12.00	16.60	24.00	33.80	49.50	71.50
" 6 "	8.00	8.45	8.45	12.50	12.50	17.20	25.00	35.00	51.00	74.00
Threads to inch..	16	14	13	12	11	10	9	8	7	7

Studs without nuts will be charged at a reduction of 15 per cent from list prices. In ordering studs, please give length of thread wanted on each end, and length of body.

MILLED. PRICE PER HUNDRED

Diameter..Inches	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$
Length $1\frac{1}{4}$ inches	\$3.35	\$4.05	\$4.40	\$5.10	.....	.....	.....	.....	.....	.....
" $1\frac{3}{4}$ "	3.50	4.20	4.60	5.30	\$6.10	.....	.....	.....	.....	.....
" 2 "	3.65	4.35	4.80	5.50	6.30	.....	.....	.....	.....	.....
" $2\frac{1}{4}$ "	3.80	4.50	5.00	5.70	6.50	\$8.80	.....	.....	.....	.....
" $2\frac{1}{2}$ "	3.95	4.65	5.20	5.90	6.70	9.10	.....	.....	.....	.....
" $2\frac{3}{4}$ "	4.10	4.80	5.40	6.10	6.90	9.40	\$12.00	.....	.....	.....
" 3 "	4.25	4.95	5.60	6.30	7.10	9.70	12.50	.....	.....	.....
" $3\frac{1}{4}$ "	4.40	5.10	5.80	6.50	7.30	10.00	13.00	\$17.00	\$21.00	.....
" $3\frac{1}{2}$ "	.....	5.25	6.00	6.70	7.50	10.30	13.50	17.75	22.00	.....
" $3\frac{3}{4}$ "	.....	5.40	6.20	6.90	7.70	10.60	14.00	18.50	23.00	\$27.00
" $3\frac{3}{4}$ "	.....	5.55	6.40	7.10	7.90	10.90	14.50	19.25	24.00	28.00
" 4 "	.....	5.75	6.60	7.30	8.10	11.20	15.00	20.00	25.00	29.00
" $4\frac{1}{2}$ "	.....	.....	6.70	7.40	8.25	11.45	15.40	20.50	25.75	29.75
" $4\frac{3}{4}$ "	.....	.....	6.80	7.50	8.40	11.65	15.75	21.00	26.50	30.50
" 5 "	.....	.....	7.00	7.60	8.55	11.90	16.15	21.50	27.25	31.25
" $5\frac{1}{4}$ "	.....	.....	7.20	7.70	8.70	12.10	16.50	22.00	28.00	32.00
" $5\frac{1}{2}$ "	.....	.....	.....	7.80	8.85	12.35	16.90	22.50	28.75	32.75
" $5\frac{3}{4}$ "	.....	.....	.....	.....	9.00	12.55	17.25	23.00	29.50	33.50
" 6 "	.....	.....	.....	.....	9.15	12.80	17.65	23.50	30.25	34.25
Threads to inch..	16	14	12	12	11	10	9	8	7	7
Add for each $\frac{1}{4}$ in.	\$0.15	.20	.20	.20	.25	.30	.40	.60	.75	1.00

EXPANSION SHIELDS

Used With Square Head Lag
Screw Malleable Iron Shield



FIG. 3478

Screw Anchor
One Part Composition Metal



FIG. 3479

EXPANSION SHIELDS ONLY FOR LAG SCREWS

Diam. of Screw, inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{2}$	3
Long Length..... "	1	1	1	1	1	1	1	1	1	1
Short..... "	1	1	1	1	1	1	1	1	1	1
Extra Short..... "	1	1	1	1	1	1	1	1	1	1
Outside Diam. "	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{2}$	3
Price..... per hundred	8.40	9.40	10.50	13.35	17.75	22.00	27.80	39.95	53.30	66.60

SCREW ANCHORS

ONE PART COMPOSITION METAL

Inside Diam. of Anchor Inches	Length of Anchor Inches	Outside Diam. of Anchor Inches	Diam. of Drill Inches	Anchor Fit Screw Numbers	Price Anchors only per 100
$\frac{1}{8}$	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{4}$	5-6-7-8	\$ 4.40
$\frac{1}{8}$	$\frac{5}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	5-6-7-8	4.40
$\frac{1}{8}$	$\frac{3}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	5-6-7-8	4.40
$\frac{1}{8}$	1	$\frac{1}{4}$	$\frac{1}{4}$	5-6-7-8	4.40
$\frac{1}{8}$	$\frac{1}{2}$	$\frac{1}{8}$	$\frac{1}{8}$	9-10-11-12	5.00
$\frac{1}{8}$	$\frac{3}{4}$	$\frac{1}{8}$	$\frac{1}{8}$	9-10-11-12	5.00
$\frac{1}{8}$	1	$\frac{1}{8}$	$\frac{1}{8}$	9-10-11-12	5.00
$\frac{1}{8}$	$\frac{1}{2}$	$\frac{1}{8}$	$\frac{1}{8}$	9-10-11-12	6.25
$\frac{1}{8}$	$\frac{3}{4}$	$\frac{1}{8}$	$\frac{1}{8}$	13-14-15	5.60
$\frac{1}{8}$	1	$\frac{1}{8}$	$\frac{1}{8}$	13-14-15	5.60
$\frac{1}{8}$	$\frac{1}{2}$	$\frac{1}{8}$	$\frac{1}{8}$	13-14-15	5.60
$\frac{1}{8}$	$\frac{3}{4}$	$\frac{1}{8}$	$\frac{1}{8}$	13-14-15	8.00
$\frac{1}{8}$	1	$\frac{1}{8}$	$\frac{1}{8}$	13-14-15	10.00
$\frac{1}{8}$	$\frac{1}{2}$	$\frac{1}{8}$	$\frac{1}{8}$	16-17-18	6.25
$\frac{1}{8}$	$\frac{3}{4}$	$\frac{1}{8}$	$\frac{1}{8}$	16-17-18	6.25
$\frac{1}{8}$	1	$\frac{1}{8}$	$\frac{1}{8}$	16-17-18	10.00
$\frac{1}{8}$	$\frac{1}{2}$	$\frac{1}{8}$	$\frac{1}{8}$	16-17-18	13.00
$\frac{1}{8}$	$\frac{3}{4}$	$\frac{1}{8}$	$\frac{1}{8}$	20-22-24	13.00
$\frac{1}{8}$	1	$\frac{1}{8}$	$\frac{1}{8}$	20-22-24	15.00
$\frac{1}{8}$	$\frac{1}{2}$	$\frac{1}{8}$	$\frac{1}{8}$	26-28-30	25.00
$\frac{1}{8}$	$\frac{3}{4}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{5}{8}$ -in. Lag Screw	30.00
$\frac{1}{8}$	1	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{5}{8}$ -in. Lag Screw	50.00

Any wood, machine or special screw may be used in these anchors.

EXPANSION SHIELDS—CONTINUED

STAR DOUBLE EXPANSION SHIELDS FOR MACHINE BOLTS



FIG. 3480

Diameter of bolt.....inches	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$
Length of shield....."	$1\frac{1}{2}$	$1\frac{7}{8}$	$2\frac{3}{8}$	$2\frac{1}{2}$	$2\frac{5}{8}$	$3\frac{1}{4}$
Size of hole to receive expansion....."	$\frac{2}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	1	1	$1\frac{1}{8}$
Diameter of drilling....."	$\frac{2}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	1	1	$1\frac{1}{8}$
Price.....per 100	\$9.00	\$11.00	\$13.00	\$16.00	\$18.00	\$24.00
Diameter of bolt.....inches	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$
Length of shield....."	4	$4\frac{3}{4}$	5	$6\frac{1}{4}$	$6\frac{1}{4}$	$7\frac{1}{2}$
Size of hole to receive expansion....."	$1\frac{3}{8}$	$1\frac{5}{8}$	$1\frac{3}{4}$	$2\frac{1}{8}$	$2\frac{1}{8}$	$2\frac{1}{2}$
Diameter of drilling....."	$1\frac{3}{8}$	$1\frac{5}{8}$	$1\frac{3}{4}$	$2\frac{1}{8}$	$2\frac{1}{8}$	$2\frac{1}{2}$
Price.....per 100	\$36.00	\$60.00	\$65.00	\$140.00	\$150.00	\$220.00

STAR SINGLE EXPANSION SHIELDS FOR MACHINE BOLTS

Diameter of bolt.....inches	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
Length of shield....."	1	$1\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{3}{4}$	2	3	$3\frac{3}{4}$	$3\frac{3}{4}$
Size of hole to receive expansion....."	$\frac{3}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	1	1	$1\frac{1}{8}$	$1\frac{3}{8}$	$1\frac{5}{8}$	$1\frac{3}{4}$
Price.....per 100	\$7.50	\$8.50	\$10.50	\$14.00	\$16.00	\$21.00	\$29.00	\$36.00	\$44.00



FIG. 3481

BOTTOM BEARING EXPANSION SHIELDS—PRICE, PER 100

Diameter of Bolt.....inches	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
Length of Shield....."	1	$\frac{5}{8}$	2	2	$2\frac{1}{2}$	$2\frac{1}{2}$	4
Size Hole to Receive Expansion....."	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{3}{8}$
Diameter of Drill Required....."	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{3}{8}$
Shipping Weight.....per 100 lbs.	3	7	12	16	20	28	62
Price.....per 100	\$9.00	\$9.50	\$12.00	\$16.00	\$19.00	\$22.00	\$35.00

We recommend these bolts wherever the use of a stud or hanger bolt is required, or where the article to be attached does not bear directly against the wall or ceiling.

TOGGLE BOLTS

No. 1

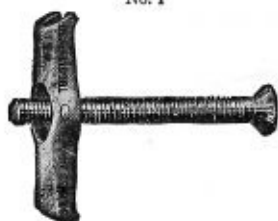


FIG. 3482

No. 5

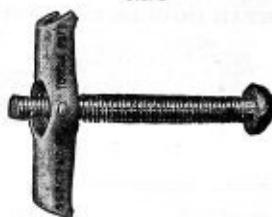


FIG. 3483

NO. 1

NO. 5
With Round or Flat Head Iron Machine Screws

Length of Screw Inches	PRICE, PER 100 DIAMETER OF SCREW, INCHES			Length of Screw Inches	PRICE, PER 100 DIAMETER OF SCREW, INCHES		
	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$		No. 8— $\frac{1}{2}$	No. 10— $\frac{3}{4}$	No. 14— $\frac{1}{2}$
3	\$6.00	\$ 7.50	\$ 8.50	3	\$ 7.50	\$ 9.00	\$10.00
3½	6.25	8.00	9.00	3½	8.00	9.50	10.50
4	6.75	8.50	9.50	4	8.50	10.00	11.00
5	7.50	9.25	10.25	4½	9.00	10.50	11.50
6	8.00	10.00	11.00	5	9.50	11.00	12.00
..	.....	.....	.....	6	10.50	12.00	13.00
Size, Hole, in.	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$				

No. 1 toggles can also be furnished $\frac{1}{16}$, $\frac{3}{16}$, $\frac{1}{8}$ or $\frac{1}{2}$ -inch diameters.

DRILL POINTS AND HOLDERS



FIG. 3484

Size of Drill Points, in.	$\frac{1}{4}$	$\frac{5}{32}$	$\frac{11}{64}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
Price per doz.	\$8.50	\$8.50	\$8.50	\$8.50	\$9.00	\$9.00	\$10.00	\$14.00

Price, Holders, fit all drills.....per dozen \$24.00

For drilling a number of small holes there is no better tool than this.

BRICK AND STONE DRILLS

SEBCO HAND FORGED STAR DRILLS



FIG. 3485

To meet the requirements of the man who drills the holes, and who heretofore has experienced difficulty in obtaining a drill that will stand the severe test his work calls for, the manufacturers have endeavored to produce a tool that will stand the strain—and stand it thoroughly. The increasing demand for Star Drills has proven their reliability.

STAR STONE DRILLS

Length, Inches	Diameter of Cutting Edge, Inches											
	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2
12 per dozen	8.50	8.50	8.50	9.00	10.00	12.00	14.00	16.00	18.00	24.00	30.00	50.00
18 "	11.00	11.00	11.00	11.50	12.50	15.00	17.50	20.00	22.50	28.00	35.00	56.00
24 "	13.50	13.50	13.50	14.00	15.00	17.50	20.00	22.50	25.00	32.00	40.00	62.00
												87.00

Drills of other and larger diameters or longer, furnished at proportionate list price.

SEBCO EXTENSION DRILL HEADS



FIG. 3486

Made of the best tool steel, perfectly tempered. Will fit any piece of gas pipe, which acts as a handle. Being light, several sizes can be carried in tool kit.

Diameter of Cutting Edge Inches	Size of Pipe for Handle Inches	Price per Dozen	Diameter of Cutting Edge Inches	Size of Pipe for Handle Inches	Price per Dozen	Diameter of Cutting Edge Inches	Size of Pipe for Handle Inches	Price per Dozen
5/8	1/4	\$3.00	1 1/8	3/4	\$ 7.50	2 3/4	1	\$27.00
3/4	1/4	3.00	1 1/2	3/4	9.00	3	1	31.00
7/8	3/8	3.00	1 3/4	1	10.50	3 1/4	1 1/4	36.00
1	1/2	3.00	2	1	12.00	3 1/2	1 1/2	40.00
1 1/8	1/2	3.60	2 1/4	1	18.00	3 3/4	1 3/4	44.00
1 1/4	3/4	4.20	2 1/2		22.00	4	1 3/4	48.00

PHILLIPS SPRING HAMMER THE FIRST AND ORIGINAL HIGH SPEED HAND DRILLING MACHINE

**FIG. 3487**

For drilling holes in concrete, brick and stone, in walls, floors and ceilings, for expansion bolts, wall bolts, plugs, pipes, pipe hangers, wires, etc.

The action and efficiency of this tool in delivering a great number of rapid blows squarely on end of drill is identical to the air hammer. No time or expense in connecting up as it requires no piping, wiring or hose, and is ready for work instantly at all times. Makes perfect round, smooth-finished holes. Can be carried to the job in kit with other tools.

No. 2—Spring Hammer for holes up to $\frac{7}{8}$ inch, approximate weight, 9 lbs.

Price, each \$17.50

No. 3—Spring Hammer for holes up to $1\frac{1}{4}$ inch, approximate weight, 12 lbs.

Price, each 21.00

PHILLIPS STAR DRILLS

Prices, each
Diameter of Cutting Edge, Inches

**FIG. 3488**

Length, Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$
8	.44	.50	.55	.60	.66	.72	.77	.83	.88	.93	.99
18	...	...	.83	.85	.92	1.00	1.08	1.15	1.23	1.30	1.38
24	...	...	...	...	.99	1.08	1.15	1.24	1.32	1.41	1.48

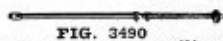
PHILLIPS HOLLOW DRILLS

Prices, each
Diameter of Cutting Edge, Inches

**FIG. 3489**

Length, Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$
8	1.21	1.26	1.32	1.37	1.43	1.48	1.54	1.92	2.20
18	1.69	1.77	1.85	1.92	2.00	2.08	2.16	2.69	3.08
24	1.81	1.90	1.98	2.06	2.14	2.20	2.31	2.88	3.30

EXTENSION

**FIG. 3490**

For use with Spring Hammer for drilling holes overhead in concrete ceiling. Holds the hammer and drill to the work and automatically follows up as the hole is drilled. Price, \$7.50.

Typical way of
drilling wall
holes.

**FIG. 3491**

Typical way of
drilling holes over-
head in concrete
ceilings and
through floors.

**FIG. 3492**

PHILLIPS OVERHEAD DRILL

A powerful and rapid tool for drilling holes up to 2 inches diameter in concrete ceilings and through floors.

With a special corner attachment it is possible to drill holes up to 2 inches diameter through floors close in corners and near walls, beams and columns, for steam risers, returns, etc.

Information on request.

SQUARE MACHINE SCREW NUTS

IRON AND BRASS



FIG. 3493

Threads	36	32	32	24-32	24	20	18	18	16-18	16	14
No.	4	6	8	10	12	14	16	18	20	24	30
Iron, list, per 100	.16	.16	.18	.20	.22	.25	.33	.43	.57	.73	1.05
Iron, list, per gross	.23	.23	.26	.29	.32	.36	.48	.62	.82	1.06	1.50
Brass, list, per 100	.50	.50	.55	.60	.65	.75	1.00	1.30	1.70	2.20	3.15
Brass, list, per gross	.72	.72	.80	.87	.94	1.08	1.44	1.88	2.45	3.17	4.55

HEXAGON MACHINE SCREW NUTS

IRON AND BRASS



FIG. 3494

Threads	36	32	32	24-32	24	20	18	18	16-18	16	14
No.	4	6	8	10	12	14	16	18	20	24	30
Iron, list, per 100	.25	.25	.28	.30	.33	.38	.50	.65	.85	1.10	1.60
Iron, list, per gross	.36	.36	.40	.43	.48	.55	.72	.94	1.22	1.58	2.30
Brass, list, per 100	.75	.75	.85	.90	1.00	1.15	1.50	1.95	2.55	3.30	4.80
Brass, list, per gross	1.08	1.08	1.22	1.30	1.44	1.66	2.16	2.81	3.67	4.75	6.91

COLD PUNCHED JAM NUTS

CHAMFERED, TRIMMED AND REAMED



FIG. 3495



FIG. 3496

Width Inches	Thick Inches	Hole Inches	Bolt Inches	Price per lb. in 200-lb. Kegs	
				Blank	Tapped
				Cents	Cents
$\frac{1}{2}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{4}$	33.	37.5
$\frac{3}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	28.	32.5
$\frac{1}{2}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8}$	24.	27.
$\frac{3}{4}$	$\frac{5}{16}$	$\frac{1}{2}$	$\frac{1}{2}$	20.	22.5
$\frac{7}{8}$	$\frac{3}{8}$	$\frac{5}{8}$	$\frac{3}{4}$	17.	18.5
$\frac{1}{10}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{7}{8}$	17.	18.5
$\frac{1}{10}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{1}{10}$	15.	16.3
$\frac{1}{14}$	$\frac{1}{10}$	$\frac{5}{8}$	$\frac{3}{4}$	13.5	14.6
$\frac{1}{10}$	$\frac{1}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	13.	14.1
$\frac{1}{8}$	$\frac{3}{8}$	$\frac{3}{4}$	1	13.	14.1
$\frac{1}{8}$	$\frac{5}{8}$	$\frac{1}{2}$	$\frac{1}{8}$	13.	14.1
2	$\frac{3}{4}$	$\frac{1}{10}$	$\frac{1}{10}$	13.	14.1
$\frac{2}{10}$	$\frac{1}{2}$	$\frac{1}{8}$	$\frac{1}{8}$	14.	15.3
$\frac{2}{10}$	$\frac{3}{4}$	$\frac{1}{8}$	$\frac{1}{8}$	14.5	16.
$\frac{2}{10}$	$\frac{1}{2}$	$\frac{1}{8}$	$\frac{1}{8}$	15.	16.7
$\frac{2}{10}$	1	$\frac{1}{2}$	$\frac{1}{8}$	16.	17.7
$\frac{2}{10}$	$\frac{1}{10}$	$\frac{1}{8}$	$\frac{1}{8}$	16.	18.
$\frac{3}{10}$	$\frac{1}{8}$	$\frac{1}{8}$	2	16.	18.1

HOT PRESSED SQUARE AND HEXAGON NUTS

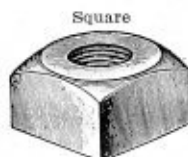


FIG. 3497

U. S. STANDARD LIST



FIG. 3498

Width, Inches	Thick- ness, Inches	Hole, Inches	Size of Bolt, Inches	Square		Hexagon		Square		Hexagon	
				Price in 200-Pound Kegs, Cents Per Pound		Price in 200-Pound Kegs, Cents Per Pound		Average Number in One Keg		Average Number in One Keg	
				Blank	Tapp'd	Blank	Tapp'd	Blank	Tapp'd	Blank	Tapp'd
1 1/2	1 1/4	3 1/16	1 1/4	13.	15.	20.	22.5	13800	14760	17400	18000
1 13/32	1 1/8	3 1/8	1 1/8	12.	13.5	18.	20.	7400	7915	9200	9760
1 11/16	3 3/8	1 5/16	1 3/8	10.5	11.6	14.	15.6	5000	5320	6000	6400
2 1/2	1 1/2	1 1/2	1 1/2	10.	10.9	13.	14.3	3200	3400	4000	4250
2 1/8	1 1/2	1 1/2	1 1/2	9.	9.7	11.2	12.2	2400	2540	3000	3200
2 13/32	1 1/2	1 1/2	1 1/2	9.	9.6	11.2	12.1	1600	1690	2128	2275
1 11/16	1 1/8	1 1/8	1 1/8	8.7	9.2	10.5	11.2	1360	1440	1540	1630
1 11/8	1 1/8	1 1/8	1 1/8	8.5	8.9	10.	10.6	832	880	968	1050
1 11/16	1 1/8	1 1/8	1 1/8	8.4	8.8	9.9	10.5	544	578	628	665
1 5/8	1	1	1	8.4	8.8	9.9	10.5	376	397	436	460
1 13/16	1 1/8	1 1/8	1 1/8	8.4	8.8	9.9	10.5	268	284	288	305
2	1 1/4	1 1/4	1 1/4	8.4	8.8	9.9	10.5	206	220	250	260
2 1/16	1 1/4	1 1/4	1 1/4	8.5	9.	10.	10.7	146	157	182	190
2 1/8	1 1/4	1 1/4	1 1/4	8.8	9.4	10.3	11.1	120	127	144	150
2 1/16	1 1/4	1 1/4	1 1/4	9.	9.7	10.5	11.4	95	100	116	120
2 3/4	1 3/4	1 3/4	1 3/4	9.3	10.	10.8	11.7	74	77	95	100
2 11/16	1 3/4	1 3/4	1 3/4	9.5	10.3	11.	12.	64	67	80	84
3 1/8	2	2	2	9.7	10.6	11.2	12.3	53	56	62	65
3 1/16	2 1/8	2 1/8	2 1/8	10.	11.	11.7	12.9	43	45	52	54
3 1/2	2 1/4	2 1/4	2 1/4	10.	11.1	11.7	13.	36	37	44	46
3 11/16	2 3/8	2 3/8	2 3/8	10.3	11.5	12.2	13.6	28	29	35	36
3 7/8	2 3/4	2 3/4	2 3/4	10.5	11.8	12.4	13.9	24	25	32	33
4 1/4	3	3	3	11.	12.4	13.	14.6	21	22	27	27
4 5/8	3	3	3	11.5	13.	13.5	15.2	16	17	18	18

For less than keg lots (200 pounds) of a size, add 20 cents per cwt. for 100 pounds or over. 50 cents per cwt. for less than 100 pounds.

COLD PUNCHED, CHAMFERED AND TRIMMED
SQUARE AND HEXAGON NUTS

WITH REAMED HOLES

Square

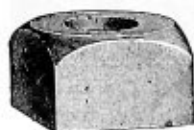


FIG. 3499

Hexagon



FIG. 3500

U. S. STANDARD LIST

Width, Inches	Thick- ness, Inches	Hole, Inches	Size of Bolt, Inches	Square		Hexagon		Square		Hexagon	
				Price in 200- Pound Kegs, Cents Per Pound		Price in 200- Pound Kegs, Cents Per Pound		Average Number In One Keg		Average Number In One Keg	
				Blank	Tapp'd	Blank	Tapp'd	Blank	Tapped	Blank	Tapped
$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{16}$	$\frac{1}{4}$	20.	22.	27.	29.5	12600	13500	13800	14750
$\frac{1}{8}$	$\frac{5}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	18.	19.5	24.	26.	7600	8150	8933	9560
$\frac{1}{8}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	14.5	15.6	18.5	20.1	4600	4900	5500	5880
$\frac{1}{8}$	$\frac{7}{16}$	$\frac{11}{32}$	$\frac{7}{16}$	14.	14.9	18.	19.3	3000	3200	3760	3990
$\frac{1}{8}$	$\frac{1}{2}$	$\frac{13}{32}$	$\frac{1}{2}$	11.3	12.	14.	15.	2320	2450	2650	2800
$\frac{1}{8}$	$\frac{9}{16}$	$\frac{29}{64}$	$\frac{9}{16}$	11.3	11.9	14.	14.9	1660	1750	1993	2110
$\frac{1}{8}$	$\frac{5}{8}$	$\frac{33}{64}$	$\frac{5}{8}$	10.	10.5	12.5	13.2	1200	1270	1440	1525
$\frac{1}{8}$	$\frac{3}{4}$	$\frac{5}{8}$	$\frac{3}{4}$	9.7	10.1	11.4	12.	740	780	896	950
$\frac{1}{8}$	$\frac{7}{8}$	$\frac{47}{64}$	$\frac{7}{8}$	9.6	10.	11.1	11.7	480	500	567	600
$\frac{1}{8}$	1	$\frac{27}{32}$	1	9.6	10.	11.1	11.7	344	365	408	435
$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{8}$	9.6	10.	11.1	11.7	244	260	296	313
$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{4}$	10.1	10.5	11.5	12.1	180	192	208	220
$\frac{1}{8}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	10.3	10.8	12.	12.7	150	160	164	175
$\frac{1}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	10.7	11.3	12.6	13.4	112	120	132	140
$\frac{1}{8}$	$\frac{5}{8}$	$\frac{13}{16}$	$\frac{5}{8}$	11.1	11.8	13.2	14.1	96	100	108	115
$\frac{1}{8}$	$\frac{3}{4}$	$\frac{15}{16}$	$\frac{3}{4}$	11.5	12.2	14.	14.9	72	77	88	93
$\frac{1}{8}$	$\frac{7}{8}$	$\frac{17}{16}$	$\frac{7}{8}$	12.	12.8	14.5	15.5	56	59	71	75
$\frac{1}{8}$	1	$\frac{19}{16}$	1	12.	12.9	14.5	15.6	48	50	60	64
$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{8}$	12.5	13.5	15.	16.2	40	42	52	55
$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{4}$	12.5	13.6	15.	16.3	32	33	46	48
$\frac{1}{8}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	13.5	14.7	16.	17.4	30	31	38	40
$\frac{1}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	13.5	14.8	16.	17.5	27	28	31	32
$\frac{1}{8}$	$\frac{5}{8}$	$\frac{13}{16}$	$\frac{5}{8}$	14.	15.4	16.5	18.1	20	21	28	29
$\frac{1}{8}$	$\frac{3}{4}$	$\frac{15}{16}$	$\frac{3}{4}$	14.	15.4	16.5	18.1	17	18	26	27
$\frac{1}{8}$	$\frac{7}{8}$	$\frac{17}{16}$	$\frac{7}{8}$	14.5	16.	17.	18.7	14	15	17	18
$\frac{1}{8}$	1	$\frac{19}{16}$	1	14.5	16.1	17.	18.8	13	14	14	14
$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{8}$	14.5	16.2	17.	18.9	9	10	11	11
$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{4}$	15.5	17.5	18.	20.	5	5	8	8

For less than keg lots (200 pounds) of a size, add 20 cents per cwt. for 100 pounds or over. 50 cents per cwt. for less than 100 pounds.



FIG. 3501

A. L. A. M. STANDARD CASTLE NUTS

Milled from bar steel. Prices same as semi-finished listed below.

PLAIN SLOTTED NUTS

Regular cold punched semi-finished or milled from bar steel as desired. Leading sizes of cold punched semi-finished slotted nuts carried in stock V thread. U. S. S. threads or A. L. A. M. thread on short notice. Prices same as semi-finished listed below.



FIG. 3502

SEMI-FINISHED AND FINISHED CASE-HARDENED HEXAGON NUTS



FIG. 3503

UNITED STATES STANDARD

The semi-finished nuts correspond with the finished nuts in all dimensions; they are our rough cold punched U. S. standard nuts, tapped and faced true on the bottom.



FIG. 3504

REVISED LIST, ADOPTED MAY 5, 1911. PRICE PER 100

Size of Screw	Width	Thickness		Number of Threads	Semi-Finished	Semi-Finished with Double Chamfer	Finished Case Hardened Nuts	Finished Case Hardened Nuts with Double Chamfer
		Regular	Check Jam					
3/16	3/8	3/16	5/32	24	\$2.00	\$2.50	\$6.00	\$6.50
1/4	1/2	1/4	3/16	20	2.00	2.50	6.00	6.50
5/16	5/8	5/16	7/32	18	2.50	2.75	7.00	7.50
3/8	3/4	3/8	1/4	16	3.25	4.00	8.00	8.75
7/16	7/8	7/16	5/16	14	3.75	4.75	9.00	10.00
1/2	1 1/8	1/2	5/8	13 or 12	4.50	5.50	10.00	11.00
9/16	1 1/4	9/16	11/32	12	5.50	6.50	12.00	13.00
5/8	1 1/2	5/8	3/4	11	6.50	7.50	16.00	17.50
11/16	1 3/4	11/16	13/32	11	8.50	10.50	22.00	24.00
3/4	2	3/4	7/8	10	8.50	10.50	22.00	24.00
7/8	2 1/8	7/8	1 1/8	9	12.00	14.50	27.00	29.50
1	2 1/4	1	1 1/4	8	17.50	21.00	38.00	41.50
1 1/8	2 3/8	1 1/8	1 1/2	7	24.00	28.50	50.00	54.50
1 1/4	2 1/2	1 1/4	1 3/4	7	33.00	39.00	66.00	72.00
1 3/8	2 3/4	1 3/8	1 7/8	6	49.00	57.00	90.00	97.00
1 1/2	3	1 1/2	2	6	69.00	78.00	120.00	130.00
1 5/8	3 1/8	1 5/8	2 1/8	5 1/2	93.00	105.00	145.00	158.00
1 3/4	3 1/4	1 3/4	2 1/4	5	130.00	145.00	175.00	190.00
2	3 1/2	2	2 1/2	5	170.00	190.00	250.00	270.00
2 1/8	3 3/8	2 1/8	2 3/8	4 1/2	215.00	240.00	325.00	350.00
2 1/4	3 1/2	2 1/4	2 1/2	4 1/2	310.00	345.00	550.00	600.00
2 3/8	3 3/4	2 3/8	2 3/4	4	475.00	525.00	850.00	950.00
2 1/2	4	2 1/2	2 1/2	4	630.00	695.00	1200.00	1350.00
3	4 1/2	3	3	3 1/2	990.00	1100.00	1800.00	2000.00

Semi-finished nuts, case-hardened, add 20 per cent to the list and use double chamfered list if round top. For finished nuts not case hardened, use regular list. For nuts polished after case hardened, add 30 per cent to the list.



FIG. 3505

DROP-FORGED THUMB NUTS

BLANK OR TAPPED

Indicate pattern desired in ordering

PRICE PER 100 OF EITHER TYPE

Unless otherwise specified Blanks will be sent



FIG. 3506

For Bolt: Size.....	1/8	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 3/4	2
U. S. Std. Threads.....	32	24	20	18	16	14	13	12	11	10	9	8
Diam. Top.....	1/4	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2
Price, Blank.....	\$1.75	2.00	2.25	2.60	3.25	4.00	5.00	6.00	7.25	10.50		
Price, Tapped.....	\$4.50	5.00	5.50	6.50	8.00	10.00	12.50	15.00	17.00	23.00		



FIG. 3507

"VULCAN" DROP-FORGED
THUMB SCREWS

BLANK OR THREADED

Prices per 100

Length Under Head	Diameter and U. S. Standard Threads per inch										
	1/8	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 3/4
	32	24	20	18	16	14	13	12	11	10	9

LIST PRICE, BLANK

1/4	\$3.40	\$3.70	\$4.00	\$4.50	\$5.10						
1/2	3.55	3.85	4.15	4.65	5.25	\$6.00	\$ 7.00	\$ 9.00			
3/4	3.70	4.00	4.30	4.80	5.40	6.20	7.20	9.25			
1	3.85	4.15	4.45	4.95	5.55	6.40	7.40	9.55	\$12.25	\$20.00	
1 1/4	4.00	4.30	4.60	5.10	5.70	6.60	7.65	9.90	12.75	20.50	
1 1/2	4.15	4.45	4.75	5.30	5.90	6.85	7.90	10.30	13.30	21.05	
1 3/4		4.60	4.90	5.50	6.10	7.10	8.20	10.75	13.90	21.70	
2		4.80	5.10	5.70	6.30	7.35	8.50	11.25	14.55	22.45	
2 1/4			5.30	5.90	6.50	7.65	8.85	11.80	15.25	23.20	
2 1/2			5.50	6.10	6.70	7.95	9.20	12.40	16.00	24.20	
2 3/4			5.70	6.30	6.95	8.25	9.60	13.05	16.80	25.20	
3			5.90	6.50	7.20	8.60	10.10	13.75	17.65	26.35	
3 1/2				6.90	7.70	9.30	11.30	15.15	19.45	28.75	
4				7.30	8.30	10.20	12.80	17.00	22.00	31.80	

LIST PRICE, THREADED

1/4	\$5.40	\$5.70	\$6.25	\$7.00	\$8.10						
1/2	5.65	5.95	6.50	7.25	8.35	\$9.60	\$11.30	\$14.75			
3/4	5.90	6.20	6.75	7.50	8.60	9.95	11.65	15.15			
1	6.20	6.50	7.05	7.80	8.90	10.35	12.05	15.65	\$20.05	\$31.00	
1 1/4	6.50	6.80	7.35	8.10	9.20	10.80	12.55	16.30	20.85	31.80	
1 1/2	6.85	7.15	7.70	8.50	9.60	11.35	13.10	17.00	21.70	32.70	
1 3/4		7.50	8.05	8.95	10.05	11.90	13.75	17.75	22.60	33.75	
2		7.95	8.50	9.40	10.50	12.45	14.40	18.65	23.65	34.95	
2 1/4			8.95	9.85	11.00	13.05	15.10	19.60	24.80	36.20	
2 1/2			9.40	10.30	11.50	13.65	15.80	20.60	26.00	37.80	
2 3/4			9.85	10.80	12.05	14.25	16.55	21.65	27.25	39.50	
3			10.30	11.30	12.60	14.90	17.40	22.75	28.60	41.35	
3 1/2				12.30	13.70	16.30	19.45	25.05	31.55	45.35	
4				13.35	15.00	18.00	22.05	28.00	35.50	50.20	

Lengths, longer than those listed, can be furnished specially from available dies; intermediate lengths take price of next longer lengths. Electric Welding to order only.

MALLEABLE THUMB OR WING NUTS

No. 5490



FIG. 3508

No. 5492



FIG. 3509

No. 5494



FIG. 3510

NO. 5490 WING NUT
MEDIUM PATTERN. TAPPED U. S. S.

No.	A	B	C	D	E	F	G
Bolt .....in.	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
Height .....in.	$\frac{4}{16}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{1}{2}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Diam. of base.....in.	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$1\frac{1}{8}$	$1\frac{1}{4}$
Per 100 pieces.....	\$0.80	1.00	1.30	1.70	2.10	4.80	4.80
No. in box.....	100	100	100	50	50	25	25

NO. 5492 WING NUT
LOW PATTERN. TAPPED U. S. S.

No.	A	B	C	D	E
Bolt .....in.	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$
Height .....in.	$\frac{5}{8}$	$\frac{4}{16}$	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{1}{2}$
Diam. of base.....in.	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{8}$	1
Per 100 pieces.....	\$0.90	1.10	1.40	2.00	2.40
No. in box.....	100	100	100	50	50

NO. 5494 WING NUT
TAPPED U. S. S.

No.	AA	A	B	C	D	E	F	G
Bolt .....in.	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
Height .....in.	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$
Diam. of base .....in.	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1
Spread of Wing.....in.	$1\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{3}{4}$	$2\frac{5}{8}$
Per 100 pieces.....	\$0.65	.80	1.00	1.30	1.70	2.10	4.80	4.80
No. in box.....	100	100	100	100	50	50	25	25

Furnished Japanned or Nickel finish to order.

MALLEABLE THUMB SCREWS

WITH MACHINE CUT THREADS

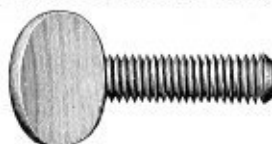


FIG. 3511

Chamfered End, No Shoulder

No. 5460. $\frac{3}{8}$ in. Shank. Threaded 24 pitch U. S. S. F.

	AA	A	X	B	C
Length of Shank.....in.	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{3}{4}$	1
Per 100 pieces.....	\$1.20	1.30	1.40	1.60	1.90

No. 5460 can be furnished threaded 10-24 or 12-24 A. S. M. E. when so ordered.

No. 5461. $\frac{1}{4}$ in Shank. Threaded 20 pitch U. S. S.

	A	X	B	Y	C	D	E	G	H
Length of Shank.....in.	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{3}{4}$	$\frac{5}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2
Per 100 pieces.....	\$1.80	1.90	2.00	2.20	2.40	2.80	3.20	3.60	4.00

No. 5461 can be furnished threaded 14-20 or 14-24 A. S. M. E. when so ordered.

No. 5462. $\frac{5}{16}$ in. Shank. Threaded 18 pitch U. S. S.

	A	B	C	D	E	G	H	K	L
Length of Shank.....in.	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{2}$	3
Per 100 pieces.....	\$2.40	2.80	3.40	3.80	4.20	4.60	5.00	5.80	6.80

No. 5463. $\frac{3}{8}$ in. Shank. Threaded 16 pitch U. S. S.

	A	B	C	D	E	G	H	J	K	L	P
Length of Shank.....in.	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	4
Per 100 pieces.....	\$3.40	3.80	4.40	4.80	5.20	6.00	7.00	8.00	9.00	10.00	12.50

No. 5464. $\frac{7}{16}$ in. Shank. Threaded 14 pitch U. S. S.

	C	D	E	G	H	J	K	L	P
Length of Shank.....in.	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	4
Per 100 pieces.....	\$5.00	5.60	6.20	7.00	8.00	9.00	10.00	11.00	14.00

No. 5465. $\frac{1}{2}$ in. Shank. Threaded 12 pitch U. S. S.

	C	D	E	G	H	J	K	L	P
Length of Shank.....in.	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	4
Per 100 pieces.....	\$5.60	6.40	7.20	8.00	8.80	9.60	10.40	12.00	15.00

Nos. 5462 to 5464 are threaded U. S. Standard only.

No. 5465 can be furnished threaded 12 pitch U. S. S. F. when so ordered.

Unless otherwise ordered, U. S. Standard thread will be sent.

WROUGHT IRON WASHERS



FIG. 3513

Size Bolt, Inches	Diameter, Inches	Size Hole, Inches	Thickness Gage	Number in One lb.	In Kegs, Per 200 lbs.
$\frac{3}{16}$	$\frac{3}{16}$	$\frac{1}{4}$	18	394	\$14.00
$\frac{1}{4}$	$\frac{3}{8}$	$\frac{5}{16}$	16	139	12.20
$\frac{5}{16}$	$\frac{7}{8}$	$\frac{3}{8}$	16	112	11.40
$\frac{3}{8}$	1	$\frac{1}{2}$	14	68	10.50
$\frac{7}{16}$	$1\frac{1}{4}$	$\frac{1}{2}$	14	43	9.80
$\frac{1}{2}$	$1\frac{3}{8}$	$\frac{5}{8}$	12	26	9.40
$\frac{5}{8}$	$1\frac{1}{2}$	$\frac{5}{8}$	12	22	9.30
$\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{1}{2}$	10	13	9.20
$\frac{7}{8}$	2	$1\frac{1}{2}$	10	10	9.10
1	$2\frac{1}{4}$	$1\frac{3}{4}$	9	8	9.00
$1\frac{1}{8}$	$2\frac{1}{2}$	$1\frac{1}{2}$	9	6	9.00
$1\frac{1}{4}$	$2\frac{3}{4}$	$1\frac{3}{4}$	9	5	9.00
$1\frac{1}{2}$	3	$1\frac{3}{4}$	9	4	9.20
$1\frac{3}{4}$	$3\frac{1}{2}$	$1\frac{3}{4}$	8	....	9.20
$1\frac{5}{8}$	4	$1\frac{5}{8}$	8	....	9.50
2	$4\frac{1}{2}$	$2\frac{1}{8}$	8	....	9.50

MINE CAR AXLE WASHERS



FIG. 3513

O. D. Inches	I. D. Inches	Axle Inches	Approximate Wt. Per 1,000		
			$\frac{1}{4}$ Inch	$\frac{3}{8}$ Inch	$\frac{1}{2}$ Inch
2	$1\frac{1}{16}$	1	82 lbs.	123 lbs.	164 lbs.
$2\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{4}$	127 "	192 "	254 "
$2\frac{3}{8}$	$1\frac{3}{8}$	$1\frac{1}{2}$	144 "	216 "	288 "
3	$1\frac{1}{2}$	$1\frac{3}{4}$	165 "	248 "	320 "
$3\frac{1}{4}$	$2\frac{1}{16}$	2	185 "	278 "	370 "
$3\frac{1}{2}$	$2\frac{1}{8}$	2	228 "	342 "	456 "
$3\frac{3}{4}$	$2\frac{3}{8}$	$2\frac{1}{4}$	150 "	225 "	300 "
$3\frac{1}{2}$	$2\frac{5}{8}$	$2\frac{1}{4}$	196 "	294 "	392 "
$3\frac{3}{4}$	$2\frac{7}{8}$	$2\frac{1}{4}$	248 "	372 "	496 "
$3\frac{3}{4}$	$2\frac{7}{8}$	$2\frac{3}{8}$	230 "	345 "	460 "
4	$2\frac{9}{8}$	$2\frac{3}{8}$	285 "	428 "	570 "
4	$2\frac{9}{8}$	$2\frac{1}{2}$	270 "	405 "	540 "
$4\frac{1}{4}$	$2\frac{7}{8}$	$2\frac{1}{2}$	325 "	488 "	650 "
$4\frac{1}{4}$	$2\frac{11}{8}$	$2\frac{3}{8}$	310 "	465 "	620 "
$4\frac{1}{2}$	$2\frac{11}{8}$	$2\frac{3}{8}$	370 "	555 "	740 "
$4\frac{1}{2}$	$2\frac{13}{8}$	$2\frac{3}{4}$	350 "	525 "	700 "
$4\frac{3}{4}$	$2\frac{13}{8}$	$2\frac{3}{4}$	415 "	623 "	830 "
5	$3\frac{1}{8}$	3	428 "	657 "	876 "

Special sizes made to order.

Prices on application.

STANDARD CAST WASHERS



FIG. 3514

Size Bolt or Rod	Dimensions	Weight per 100	Per 100 lbs.
$\frac{1}{2}$	2 x $\frac{3}{8}$	Lbs. 21	\$.....
$\frac{5}{8}$	2 $\frac{1}{2}$ x $\frac{1}{2}$	" 43	.....
$\frac{3}{4}$	3 x $\frac{5}{8}$	" 70	.....
$\frac{7}{8}$	3 $\frac{1}{2}$ x $\frac{3}{4}$	" 113	.....
1	4 x $\frac{7}{8}$	" 175	.....
1 $\frac{1}{4}$	5 x 1 $\frac{1}{8}$	" 322	.....
1 $\frac{1}{2}$	6 x 1 $\frac{3}{8}$	" 610	.....
2	7 $\frac{1}{2}$ x 1 $\frac{3}{8}$	" 1115	.....

SPECIAL CAST-IRON WASHERS

Square Beveled

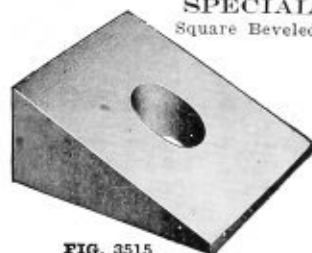


FIG. 3515

Round Beveled



FIG. 3516

Made to order in any size, shape or weight.

SQUARE PLATE WASHERS



FIG. 3517

Size Bolt, Inches	Diameter, Inches	Size Hole, Inches	Thickness, Inches	Number in 100 lbs.	Per lb., cts.
$\frac{3}{8}$	1 $\frac{1}{2}$	$\frac{7}{16}$	$\frac{1}{8}$	1300	9.4
$\frac{1}{2}$	2	$\frac{7}{16}$	$\frac{1}{8}$	500	8.3
$\frac{5}{8}$	2 $\frac{1}{4}$	$\frac{7}{16}$	$\frac{1}{4}$	315	8
$\frac{3}{4}$	2 $\frac{1}{2}$	$\frac{7}{16}$	$\frac{1}{4}$	250	8
$\frac{7}{8}$	3	$\frac{7}{16}$	$\frac{1}{4}$	165	8
1	3 $\frac{1}{2}$	1 $\frac{1}{16}$	$\frac{3}{8}$	87	8
1 $\frac{1}{4}$	4 $\frac{1}{2}$	1 $\frac{3}{8}$	$\frac{3}{8}$	48	8
1 $\frac{1}{2}$	6	1 $\frac{5}{8}$	$\frac{3}{8}$	28	8

200 lbs. in a keg.

NO. 10—MALLEABLE IRON NUT-LOCK WASHERS



Top View

SEE THAT POINT IT LOCKS WASHER
FIG. 3518
SEE THAT LOW IT LOCKS NUT

Bottom View

PACKED IN 200-LB. KEGS

Hole, size of bolt.....inches	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	1 $\frac{1}{8}$	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2
Diameter .....inches	2 $\frac{1}{2}$	2 $\frac{3}{4}$	3	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$	5	6	6	7 $\frac{1}{2}$
Thickness .....inches	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$
Wt. per 100 Washers.....pounds	15	22	33	50	68	87	150	190	206	420

Comparative weight of old style cast washers

Wt. per 100 Washers.....pounds	45	66	100	150	200	262	450	575	618	1262
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"BESTOVALL" LOCK WASHERS

RIB PATTERN



FIG. 3519

No.	Size Bolt, Inches	Size Steel	Price Per 1000	No.	Size Bolt, Inches	Size Steel	Price Per 1000
1125	$\frac{3}{16}$	$\frac{3}{16} \times \frac{3}{4}$	\$2.70	1174	$\frac{7}{8}$	$\frac{3}{4} \times \frac{1}{2}$	\$31.70
1127	$\frac{1}{4}$	$\frac{3}{16} \times \frac{3}{4}$	3.35	1188	1	$\frac{3}{4} \times \frac{1}{4}$	41.70
1135	$\frac{1}{2}$	$\frac{3}{16} \times \frac{3}{4}$	7.00	1200	$1\frac{1}{8}$	$\frac{3}{4} \times \frac{1}{4}$	45.00
1138	$\frac{3}{8}$	$\frac{3}{16} \times \frac{3}{4}$	7.70	1206	$1\frac{1}{4}$	$\frac{3}{4} \times \frac{1}{4}$	49.00
1142	$\frac{1}{2}$	$\frac{3}{16} \times \frac{3}{4}$	8.35	1211	$1\frac{3}{8}$	$\frac{3}{4} \times \frac{1}{4}$	53.00
1145	$\frac{1}{2}$	$\frac{3}{16} \times \frac{3}{4}$	9.00	1216	$1\frac{1}{2}$	$\frac{3}{4} \times \frac{1}{4}$	57.70
1148	$\frac{3}{8}$	$\frac{3}{16} \times \frac{3}{4}$	10.00	1220	$1\frac{5}{8}$	$\frac{3}{4} \times \frac{1}{4}$	62.70
1152	$\frac{3}{8}$	$\frac{3}{4} \times \frac{1}{2}$	15.70	1225	$1\frac{3}{4}$	$\frac{3}{4} \times \frac{1}{4}$	68.00
1161	$\frac{3}{4}$	$\frac{3}{16} \times \frac{3}{4}$	25.00	1230	$1\frac{7}{8}$	$\frac{3}{4} \times \frac{1}{4}$	73.70
				1235	2	$\frac{3}{4} \times \frac{1}{4}$	80.00

PLAIN "FORT PITT" LOCK WASHERS

Plain



FIG. 3520

Positive



FIG. 3521

Size Bolt, Inches	Size Steel	PLAIN		POSITIVE	
		No.	Price per 1000	No.	Price per 1000
$\frac{3}{16}$	$\frac{3}{16} \times \frac{3}{4}$	87	\$2.00	644	\$3.70
$\frac{1}{4}$	$\frac{3}{16} \times \frac{3}{4}$	108	3.70	665	5.35
$\frac{1}{2}$	$\frac{3}{16} \times \frac{3}{4}$	122	4.35	679	6.00
$\frac{3}{8}$	$\frac{3}{16} \times \frac{3}{4}$	153	9.00	710	10.70
$\frac{1}{2}$	$\frac{3}{16} \times \frac{3}{4}$	109	9.70	726	11.35
$\frac{1}{2}$	$\frac{3}{16} \times \frac{3}{4}$	187	10.35	744	12.00
$\frac{3}{8}$	$\frac{3}{16} \times \frac{3}{4}$	206	14.00	763	15.70
$\frac{3}{8}$	$\frac{3}{4} \times \frac{1}{2}$	230	20.35	787	22.00
$\frac{3}{8}$	$\frac{1}{4} \times \frac{1}{4}$	273	22.35	830	24.35
$\frac{3}{8}$	$\frac{1}{4} \times \frac{1}{4}$	303	24.70	860	26.70
1	$\frac{1}{4} \times \frac{1}{4}$	329	27.35	896	29.35
$1\frac{1}{8}$	$\frac{1}{4} \times \frac{1}{4}$	374	30.35	931	33.70
$1\frac{1}{4}$	$\frac{1}{4} \times \frac{1}{4}$	393	33.70	950	36.35
$1\frac{3}{8}$	$\frac{1}{4} \times \frac{1}{4}$	411	37.35	968	40.00
$1\frac{1}{2}$	$\frac{1}{4} \times \frac{1}{4}$	429	41.35	986	45.35
$1\frac{3}{4}$	$\frac{3}{8} \times \frac{1}{4}$	463	51.35	1020	64.00
$1\frac{7}{8}$	$\frac{3}{8} \times \frac{3}{8}$	482	100.00	1039	109.70
2	$\frac{3}{8} \times \frac{3}{8}$	495	106.70	1052	118.00

"FORT PITT" LOCK WASHERS

Type "B" Plain



FIG. 3522

Type "D" Positive



FIG. 3523

S. A. E. LIGHT PATTERN

Size Bolt, in.	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{5}{8}$
Size Steel, in.	$\frac{1}{2} \times \frac{3}{4}$	$\frac{1}{2} \times \frac{1}{2}$	$\frac{5}{8} \times \frac{1}{2}$	$\frac{3}{4} \times \frac{1}{2}$	$\frac{7}{8} \times \frac{1}{2}$	$\frac{1}{2} \times \frac{1}{2}$	$\frac{3}{4} \times \frac{1}{2}$	$\frac{5}{8} \times \frac{1}{2}$	$\frac{3}{4} \times \frac{1}{2}$	$\frac{7}{8} \times \frac{1}{2}$	$\frac{1}{2} \times \frac{1}{2}$	$\frac{3}{4} \times \frac{1}{2}$	$\frac{5}{8} \times \frac{1}{2}$	$\frac{3}{4} \times \frac{1}{2}$	$\frac{7}{8} \times \frac{1}{2}$
Type "B" No.	80	99	127	148	170	188	207	222	250	272	304	344	380		
Price per 1000	\$1.35	2.70	5.00	5.70	9.00	9.70	13.35	14.35	18.70	19.70	22.70	33.00	40.35		
Type "D" No.	637	656	684	705	727	745	764	779	807	829	861	901	937		
Price per 1000	\$3.00	4.35	6.70	7.35	10.70	11.35	15.00	16.00	20.35	21.70	24.70	35.00	43.70		

S. A. E. LIGHT STANDARDS FOR FILLISTER HEAD MACHINE

SCREWS—PLAIN PATTERN

Screw Size No.	4	6	8	10	12	14
Steel Size in.	$\frac{3}{32} \times .022$	$\frac{1}{16} \times \frac{1}{32}$	$\frac{1}{8} \times \frac{1}{32}$	$\frac{1}{4} \times \frac{1}{32}$	$\frac{1}{2} \times \frac{1}{32}$	$\frac{5}{8} \times \frac{1}{32}$
I. D.	.114	.141	.172	.203	.219	.250
Counter Bore	.188	.250	.281	.344	.375	.438
Price per 1000	\$4.35	2.70	2.35	1.35	1.70	2.70

S. A. E. A. H. HEAVY PATTERN

Size Bolt, inch	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{5}{8}$
Size Steel, inch	$\frac{1}{2} \times \frac{1}{8}$	$\frac{5}{8} \times \frac{1}{8}$	$\frac{1}{2} \times \frac{1}{8}$	$\frac{1}{2} \times \frac{1}{8}$	$\frac{1}{2} \times \frac{1}{8}$	$\frac{1}{2} \times \frac{1}{8}$	$\frac{1}{2} \times \frac{1}{8}$	$\frac{1}{2} \times \frac{1}{8}$	$\frac{1}{2} \times \frac{1}{8}$
Type "B" No.	81	100	128	149	171	189	208	223	
Price per 1000	\$1.70	3.00	5.70	6.35	11.00	11.70	15.35	16.35	
Type "D" No.	638	657	685	706	728	746	765	780	
Price per 1000	\$3.35	4.70	7.35	8.00	12.70	13.35	17.00	18.00	
Size Bolt, inch	$\frac{1}{2}$	$\frac{3}{4}$	1	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Size Steel, inch	$\frac{1}{2} \times \frac{1}{4}$	$\frac{1}{2} \times \frac{1}{4}$	$\frac{1}{2} \times \frac{1}{4}$	$\frac{1}{2} \times \frac{1}{4}$	$\frac{1}{2} \times \frac{1}{4}$	$\frac{1}{2} \times \frac{1}{4}$	$\frac{1}{2} \times \frac{1}{4}$	$\frac{1}{2} \times \frac{1}{4}$	$\frac{1}{2} \times \frac{1}{4}$
Type "B" No.	251	273	305	345	380	404	422	443	
Price per 1000	\$21.35	22.35	26.70	37.50	40.35	71.70	76.70	93.35	
Type "D" No.	808	830	862	902	937	961	979	1000	
Price per 1000	\$23.00	24.35	28.70	40.00	43.70	75.70	80.70	99.35	

S. A. E. HEAVY STANDARDS FOR FILLISTER HEAD

MACHINE SCREWS—PLAIN PATTERN

Screw Size No.	4	6	8	10	12	14
Steel Size in.	$\frac{1}{32} \times \frac{1}{32}$	$\frac{1}{16} \times \frac{1}{32}$	$\frac{1}{8} \times \frac{1}{32}$	$\frac{1}{4} \times \frac{1}{32}$	$\frac{1}{2} \times \frac{1}{32}$	$\frac{5}{8} \times \frac{1}{32}$
I. D.	.114	.141	.172	.203	.219	.250
Counter Bore	.188	.250	.281	.344	.375	.438
Price per 1000	\$5.70	4.70	4.00	3.35	3.70	4.70

BUILDERS' IRON WORK

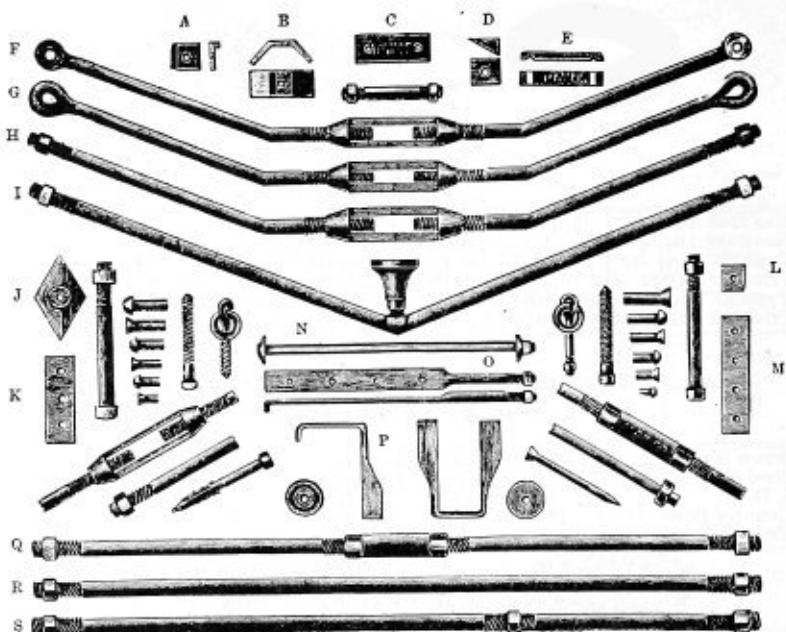


FIG. 3524

PRICES GIVEN ON RECEIPT OF SPECIFICATIONS

BRIDGE RODS AND BOLTS

COMBINATION



FIG. 3525

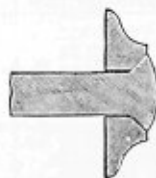


FIG. 3526

STATE QUANTITY AND SIZES WANTED

WROUGHT IRON OPEN HEXAGONAL TURNBUCKLES

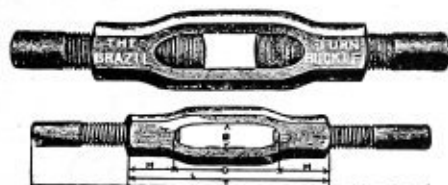


FIG. 3527

Complete with Right and Left Bolt Ends.

B Size—Diameter of Screw.
 O—Opening between heads, 5½ inches. First length for all sizes.
 H—Length of Tapped Heads.
 L—Length of Buckle, without Bolt Ends.
 T—Total length of Buckle and Bolt Ends.

Size B Inch	O Inch	H Inch	L Inch	T Inch	Price Each	Size B Inch	O Inch	H Inch	L Inch	T Inch	Price Each
½	5½	¾	7¼	22	\$0.38	1½	5½	2¾	10¾	28	\$1.75
⅝	5½	¾	7¼	22	.40	1¾	5½	2¾	11¼	28	2.00
⅞	5½	1	7½	22	.42	1⅞	5½	3	11½	29	2.25
1	5½	1	7½	22	.45	2	5½	3⅞	12	29	2.65
1⅛	5½	1⅞	7½	22	.48	2¼	5½	3¾	12¾	29	3.10
1¼	5½	1¾	7¾	22	.50	2½	5½	3¾	12¾	30	3.50
1⅝	5½	1¾	8¼	23	.63	2¾	5½	3¾	12¾	31	4.00
1⅞	5½	1½	8½	24	.75	3	5½	4	13¼	32	4.50
2	5½	1½	9	25	.88	3½	5½	4¼	13¾	32	5.00
2¼	5½	1¾	9¾	25	1.00	3¾	5½	4¾	14¼	33	5.50
2½	5½	2	9¾	26	1.25	4	5½	4¾	14¾	33	6.00
2¾	5½	2¼	10½	27	1.38	4½	5½	4¾	15	34	6.50
3	5½	2½	10½	27	1.50						



FIG. 3528

Buckles without Bolt Ends, tapped U. S. Standard at a liberal discount from above list.

Ordinary sizes and lengths carried in stock.

Extra lengths furnished to order.

Above prices are for first or standard length buckles, viz: 5½ inches clear, between heads.

OPENINGS

The "size" of the Buckle is the outside diameter of the screw.

Lengths given on previous page are Standard for Bridge, Roof and ordinary Truss Buckles.

The Second Length, viz: 9 inches between heads (O) and 3½ inches longer over all (T), add 25 per cent to list prices.

For Third Length, viz: 12 inches between heads (O) and 6½ inches longer over all (T), add 50 per cent to list prices.

For Fourth Length, viz: 15 inches between heads (O) and 9½ inches longer over all (T), add 100 per cent to list prices.

For Fifth Length, viz: 18 inches between heads (O) and 12½ inches longer over all (T), add 150 per cent to list prices.

Sixth Length Buckles, viz: 24 inches between heads (O) and 18½ inches longer over all (T), are three and one-half times the prices given in the list.

We can make sizes from ½ to ¾ inch, inclusive with 4 inch opening.

TURNBUCKLES WITH HOOKS AND EYES

PLAIN AND GALVANIZED

Two Hooks—Style A



FIG. 3529

Hook and Eye—Style B



FIG. 3530

Two Eyes—Style C



FIG. 3531

Hook and Swivel Eye—Style D

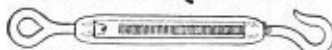


FIG. 3532

Eye and Swivel Eye—Style E



FIG. 3533

Styles indicated by light face capitals, A B C, are carried in stock in both Plain and Galvanized.

Styles indicated by Bold Face Caps, D E, in stock in Galvanized only.

Styles indicated by small letters, a b c, are carried in stock in Plain only.

Diam. of Threads, Inches	Length Bet. Heads, Inches	Styles Carried in Stock	Estimated Weight Per 100	Diam. of Threads, Inches	Length Bet. Heads, Inches	Styles Carried in Stock	Estimated Weight Per 100
$\frac{3}{16}$ x $3\frac{1}{2}$		A B C D	15 lbs.	$\frac{3}{8}$ x 18		a b c	10 lbs. ea.
$\frac{1}{4}$ x 4		A B C D	30 "	1 x 6		A B C	9 "
$\frac{1}{8}$ x $4\frac{1}{4}$		A B C D	50 "	1 x 9		A B C	10 "
$\frac{3}{8}$ x $4\frac{1}{2}$		A B C D E	75 "	1 x 12		A B C	11 "
$\frac{7}{16}$ x 9		A B C	145 "	1 x 18		a b c	14 "
$\frac{1}{2}$ x 5		A B C	125 "	1 x 24		a b c	17 "
$\frac{1}{2}$ x 6		A B C D E	175 "	$1\frac{1}{8}$ x 6		a b c	12 "
$\frac{1}{2}$ x 9		A B C	200 "	$1\frac{1}{8}$ x 12		a b c	9 "
$\frac{1}{2}$ x 12		A B C	240 "	$1\frac{1}{8}$ x 18		a b c	18 "
$\frac{5}{8}$ x 6		A B C D E	265 "	$1\frac{1}{4}$ x 6		a b c	16 "
$\frac{5}{8}$ x 9		A B C	335 "	$1\frac{1}{4}$ x 12		a b c	19 "
$\frac{5}{8}$ x 12		A B C	420 "	$1\frac{1}{4}$ x 18		a b c	22 "
$\frac{3}{4}$ x 6		A B C D E	400 "	$1\frac{1}{4}$ x 24		a b c	26 "
$\frac{3}{4}$ x 9		A B C	460 "	$1\frac{3}{8}$ x 6		a b c	23 "
$\frac{3}{4}$ x 12		A B C	610 "	$1\frac{3}{8}$ x 12		a b c	26 "
$\frac{3}{4}$ x 18		a b c	730 "	$1\frac{3}{8}$ x 18		a b c	38 "
$\frac{3}{4}$ x 24		a b c	850 "	$1\frac{5}{8}$ x 6		a b c	32 "
$\frac{7}{8}$ x 6		A B C	625 "	$1\frac{5}{8}$ x 12		a b c	36 "
$\frac{7}{8}$ x 9		A B C	720 "	$1\frac{5}{8}$ x 18		a b c	43 "
$\frac{7}{8}$ x 12		A B C	800 "	2 x 6		a b c	50 "

BOILER AND STRUCTURAL RIVETS

Cone Head



FIG. 3524

Countersunk Head



FIG. 3535

Button Head



FIG. 3536

AVERAGE NUMBER OF CONE HEAD RIVETS OF ENUMERATED SIZES IN 100 POUNDS

Length, Inch.	Diameter, Inches							Length, Inch.	Diameter, Inches						
	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{11}{16}$	$\frac{3}{4}$	$\frac{7}{8}$	1		$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{11}{16}$	$\frac{3}{4}$	$\frac{7}{8}$	1
$\frac{3}{4}$	2373	1103	642	...	...	...	...	$3\frac{1}{2}$	837	433	270	208	177	126	82
$\frac{7}{8}$	2190	1030	604	...	...	...	...	$3\frac{3}{4}$	791	411	257	198	168	120	79
1	2034	968	571	400	345	...	...	4	749	390	244	189	161	115	77
$1\frac{1}{8}$	1898	910	541	382	322	208	...	$4\frac{1}{4}$	700	372	233	180	155	110	75
$1\frac{1}{4}$	1780	862	514	365	311	206	...	$4\frac{1}{2}$	650	355	223	172	149	105	73
$1\frac{3}{8}$	1675	815	489	350	295	204	...	$4\frac{3}{4}$	625	339	214	166	143	101	71
$1\frac{1}{2}$	1582	776	462	335	284	201	...	5	600	325	205	160	136	97	69
$1\frac{5}{8}$	1498	740	446	324	275	199	132	$5\frac{1}{4}$	575	312	197	154	131	94	67
$1\frac{3}{4}$	1424	707	428	311	266	192	128	$5\frac{1}{2}$	550	300	190	149	127	91	65
$1\frac{7}{8}$	1356	672	411	302	257	185	124	$5\frac{3}{4}$	525	289	183	144	123	88	63
2	1295	648	395	293	249	178	120	6	500	279	177	139	118	85	61
$2\frac{1}{8}$	1238	623	381	285	240	172	116	$6\frac{1}{4}$	...	...	171	135	114	82	59
$2\frac{1}{4}$	1187	599	367	277	233	167	112	$6\frac{1}{2}$	...	...	165	131	110	79	57
$2\frac{3}{8}$	1139	577	354	269	226	162	108	$6\frac{3}{4}$	...	...	160	127	107	77	55
$2\frac{1}{2}$	1095	556	343	261	219	157	104	7	...	...	155	123	104	75	53
$2\frac{5}{8}$	1052	537	332	253	212	152	100	$7\frac{1}{4}$	...	...	150	119	100	73	51
$2\frac{3}{4}$	1017	519	321	245	206	148	96	$7\frac{1}{2}$	...	...	146	116	97	71	49
$2\frac{7}{8}$	982	503	311	237	201	144	92	$7\frac{3}{4}$	...	...	142	113	94	69	47
3	949	487	302	230	196	140	88	8	...	...	138	110	92	67	45
$3\frac{1}{4}$	890	459	285	218	186	132	85	...	...	...	...	...	...	...	...

STANDARD LIST OF EXTRAS—Adopted October 15, 1912.

On Boiler and Structural Rivets. In Kegs or Bags Weighing 200 to 300 Pounds.

Boiler Rivets, Standard Heads, $\frac{3}{4}$ to $1\frac{1}{4}$ -in. Diam., Incl., 2 to 5 in. Long..	Base
Structural Rivets, Standard Heads, $\frac{3}{4}$ to $1\frac{1}{4}$ -in. Diam., Incl., 2 to 5 in. Long	Base

EXTRAS, PER 100 POUNDS—Adopted October 15, 1912.

$\frac{1}{2}$ and $\frac{3}{8}$ -inch Diameter	\$0.50
$\frac{5}{8}$ " $\frac{11}{16}$ " "	.15
Larger than $1\frac{1}{4}$ -inch Diameter	.25
Lengths 1 inch and Shorter, All Diameters from $\frac{1}{2}$ -inch up.....	.50
" between 1 and 2 inches	.25
" over 5 inches	.25
Flat Head Standard Countersunk Head and Swell Neck Rivets.....	.25
Rivets packed in 100-pound Kegs	.10
Items under 100 pounds of a Size, for each Broken Lot	*.50
Rivets 5 in. Long or over, Ordered in Lots of 1000 lbs. or less than 1000 lbs.	.25

*Net.

All cone and countersunk head rivets to be charged at boiler rivet price.

Special rivets and rivets made cold, will be charged extra.

RIVETS

ANY STYLE HEAD

Steeple
Head

FIG. 3537

Cone
Head

FIG. 3538

Flat
Head

FIG. 3539

Countersunk
Head

FIG. 3540

Bung
Head

FIG. 3541

Wagon Box
Head

FIG. 3542

Truss
Hoop
Head

FIG. 3543

PRICE PER POUND—IN 5 AND 10-POUND BOXES

Adopted March 19, 1913

Size Wire	Length, Inches																
	1 and longer	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
$\frac{1}{16}$	.19	.19 $\frac{1}{2}$	.19 $\frac{1}{2}$	.20	.20	.20	.21	.21	.21	.21	.21	.21	.21	.21	.21	.21	.21
$\frac{1}{8}$	.19	.19 $\frac{1}{2}$	.19 $\frac{1}{2}$	.20	.20	.20	.21	.21	.21	.21	.21	.21	.21	.21	.21	.21	.21
$\frac{3}{16}$	.19 $\frac{1}{2}$	.20	.20	.20 $\frac{1}{2}$	.20 $\frac{1}{2}$	.20 $\frac{1}{2}$	.21	.21	.21	.21	.21	.21	.21	.21	.21	.21	.21
$\frac{1}{4}$	.20	.20 $\frac{1}{2}$	.20 $\frac{1}{2}$	.21	.21	.21	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22
$\frac{5}{16}$	.20	.20 $\frac{1}{2}$	.20 $\frac{1}{2}$	.21	.21	.21	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22
$\frac{3}{8}$	.20	.20 $\frac{1}{2}$	.20 $\frac{1}{2}$	.21	.21	.21	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22
$\frac{7}{16}$	.20	.20 $\frac{1}{2}$	.20 $\frac{1}{2}$	.21	.21	.21	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22
$\frac{1}{2}$	.21	.21 $\frac{1}{2}$	.21 $\frac{1}{2}$	.22	.22	.22	.23	.23	.23	.23	.23	.23	.23	.23	.23	.23	.23
$\frac{5}{8}$	.21	.21 $\frac{1}{2}$	.21 $\frac{1}{2}$	.22	.22	.22	.23	.23	.23	.23	.23	.23	.23	.23	.23	.23	.23
$\frac{3}{4}$	.21	.21 $\frac{1}{2}$	.21 $\frac{1}{2}$	.22	.22	.22	.23	.23	.23	.23	.23	.23	.23	.23	.23	.23	.23
$\frac{7}{8}$	.21	.21 $\frac{1}{2}$	.21 $\frac{1}{2}$	.22	.22	.22	.23	.23	.23	.23	.23	.23	.23	.23	.23	.23	.23
1	.21	.21 $\frac{1}{2}$	.21 $\frac{1}{2}$	.22	.22	.22	.23	.23	.23	.23	.23	.23	.23	.23	.23	.23	.23
2	.21	.21 $\frac{1}{2}$	.21 $\frac{1}{2}$	.22	.22	.22	.23	.23	.23	.23	.23	.23	.23	.23	.23	.23	.23
3	.21	.21 $\frac{1}{2}$	.21 $\frac{1}{2}$	.22	.22	.22	.23	.23	.23	.23	.23	.23	.23	.23	.23	.23	.23
4	.21	.21 $\frac{1}{2}$	.21 $\frac{1}{2}$	.22	.22	.22	.23	.23	.23	.23	.23	.23	.23	.23	.23	.23	.23
5	.21	.21 $\frac{1}{2}$	.21 $\frac{1}{2}$	.22	.22	.22	.23	.23	.23	.23	.23	.23	.23	.23	.23	.23	.23
6	.21	.21 $\frac{1}{2}$	.21 $\frac{1}{2}$	.22	.22	.22	.23	.23	.23	.23	.23	.23	.23	.23	.23	.23	.23
7	.21	.21 $\frac{1}{2}$	.21 $\frac{1}{2}$	.22	.22	.22	.23	.23	.23	.23	.23	.23	.23	.23	.23	.23	.23
8	.22	.22 $\frac{1}{2}$	.22 $\frac{1}{2}$	.23	.23	.23	.24	.24	.24	.24	.24	.24	.24	.24	.24	.24	.24
9	.23	.23 $\frac{1}{2}$	.23 $\frac{1}{2}$	.24	.24	.24	.25	.25	.25	.25	.25	.25	.25	.25	.25	.25	.25
10	.24	.24 $\frac{1}{2}$	.24 $\frac{1}{2}$	.25	.25	.25	.26	.26	.26	.26	.26	.26	.26	.26	.26	.26	.26
11	.25	.25 $\frac{1}{2}$	.25 $\frac{1}{2}$	.26	.26	.26	.27	.27	.27	.27	.27	.27	.27	.27	.27	.27	.27
12	.26	.26 $\frac{1}{2}$	.26 $\frac{1}{2}$	.27	.27	.27	.28	.28	.28	.28	.28	.28	.28	.28	.28	.28	.28
13	.30	.30 $\frac{1}{2}$	.30 $\frac{1}{2}$	.31	.31	.31	.33	.33	.33	.33	.33	.33	.33	.33	.33	.33	.33
14	.32 $\frac{1}{2}$	.32 $\frac{1}{2}$	.32 $\frac{1}{2}$	.33	.33	.33	.36	.36	.36	.36	.36	.36	.36	.36	.36	.36	.36

Rivets made from smaller wire than No. 14, all lengths, list \$0.80 per pound; $\frac{1}{16}$ -inch diameter, list price of No. 13; $\frac{1}{8}$ -inch diameter, list of No. 11; $\frac{3}{16}$ -inch diameter, list price of No. 8; $\frac{1}{2}$ -inch diameter, list price of No. 5; $\frac{3}{4}$ -inch diameter, list price of No. 2.

List extras: For shoulder and pointed rivets, add \$0.02 per pound to list price for each specialty, except pointed hame, caster and sucker rod. Intermediate lengths and diameters, list prices of nearest smaller size.

Net extras: For tin or copper plating, add \$0.01 $\frac{1}{2}$ per pound to net price; for metallic tinning, add \$0.03 $\frac{1}{2}$ per pound to net price. When "tinned" rivets are ordered, metallic tinned are furnished. For bright polishing rivets after annealing, add \$0.25 net extra per cwt.

List rebates: For 25 and 50-pound boxes, deduct \$0.02; for 100-pound boxes, deduct \$0.03, and for 100 and 200-pound kegs, deduct \$0.04 per pound from list price.

TINNER'S RIVETS



FIG. 3544

Adopted March 19, 1913

IN PACKAGES OF 1000 RIVETS

Size	pounds	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Price, Black	per 1000	\$0.20	\$0.22	\$0.24	\$0.26	\$0.28	\$0.29	\$0.32	\$0.37
" Metallic Tinned	"	.28	.31	.35	.39	.43	.47	.54	.64
" Tin-plated	"	.24	.26	.29	.32	.35	.37	.42	.49
Size	pounds	$1\frac{3}{4}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
Price, Black	per 1000	\$0.41	\$0.44	\$0.56	\$0.62	\$0.72	\$0.79	\$1.00	\$1.12
" Metallic Tinned	"	.72	.79	1.00	1.15	1.34	1.49	1.88	2.17
" Tin-plated	"	.55	.59	.75	.85	.99	1.09	1.38	1.57
Size	pounds	7	8	9	10	12	14	16	.....
Price, Black	per 1000	\$1.31	\$1.50	\$1.68	\$1.77	\$2.06	\$2.40	\$2.77	.....
" Metallic Tinned	"	2.54	2.90	3.26	3.52	4.16	4.83	5.57	.....
" Tin-plated	"	1.84	2.10	2.36	2.52	2.96	3.45	3.97	.....

For oval or countersunk heads, shoulder or pointed, or extra length rivets, add \$0.10 per 1000 for each specialty.

IN BULK

Size	pounds	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Price, Black	per pound	\$0.48	\$0.42	\$0.38	\$0.33	\$0.33	\$0.30	\$0.27	\$0.26
Size	pounds	$1\frac{3}{4}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
Price, Black	per pound	.23	.24	.24	.23	.23	.22	.22	.21
Size	pounds	7	8	9	10	12	14	16	.....
Price, Black	per pound	.21	.21	.21	.20	.19 $\frac{1}{2}$	.19 $\frac{1}{2}$	.19 $\frac{1}{2}$	.....

List extras: For oval head and shoulder, or extra length rivets, add \$0.02 per pound to list price for each specialty.

Net extras: For tin or copper plating, add \$0.01 $\frac{1}{2}$, and for metallic tinning, add \$0.03 $\frac{1}{2}$ per pound to net prices. When "tinned" rivets are ordered, metallic tinned are furnished. For bright polishing rivets after annealing, add \$0.25 net extra per cwt.

List rebates: For 25 and 50-pound boxes, deduct \$0.02; for 100-pound boxes, deduct \$0.03, and for 100 and 200-pound kegs, deduct \$0.04 per pound from list price.

APPROXIMATE DIMENSIONS OF TINNER'S RIVETS

Size	pounds	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$
Length	inches	$\frac{3}{4}$	$\frac{11}{16}$	$\frac{7}{8}$	$\frac{15}{16}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{11}{8}$	$\frac{3}{4}$
Diameter, Wire Gauge....no.		13 $\frac{1}{4}$	13	12 $\frac{1}{4}$	12	11 $\frac{3}{4}$	11	10 $\frac{1}{4}$	10
Size	pounds	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6	7
Length	inches	$\frac{11}{16}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{15}{16}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{11}{8}$	$\frac{3}{4}$
Diameter, Wire Gauge....no.		9 $\frac{1}{4}$	9	8 $\frac{1}{4}$	8	7 $\frac{1}{4}$	6 $\frac{3}{4}$	6	5 $\frac{1}{4}$
Size	pounds	8	9	10	12	14	16	.....	.....
Length	inches	$\frac{7}{8}$	$\frac{22}{16}$	$\frac{33}{16}$	$\frac{1}{2}$	$\frac{33}{16}$	$\frac{11}{8}$	.....	.....
Diameter, Wire Gauge....no.		4 $\frac{3}{4}$	4 $\frac{1}{4}$	4	3	2	1	.....	.....

BLACK BURRS

1 LB. BOXES

Size	Dimensions			Cents per Lb.	Number in 1 Lb.	Size	Dimensions			Cents per Lb.	Number in 1 Lb.
	Diam.	Hole	Gage				Diam.	Hole	Gage		
15	$\frac{1}{4}$	.077	21	80	3,400	7	$\frac{1}{2}$	.185	18	43	450
14	$\frac{1}{4}$	.088	21	80	3,300	$\frac{3}{8}$	$\frac{1}{2}$	.197	18	42	450
13	$\frac{1}{2}$	.096	20	70	1,825	6	$\frac{1}{2}$	.213	18	42	460
12	$\frac{1}{2}$	.114	20	60	1,320	5	$\frac{1}{2}$	.230	17	38	270
11	$\frac{1}{2}$	.125	19	50	1,280	4	$\frac{1}{2}$	.247	16	37	235
10 $\frac{1}{2}$	$\frac{3}{4}$	.130	19	47	1,000	$\frac{1}{4}$	$\frac{5}{8}$	.260	16	36	245
10	$\frac{3}{4}$	.139	19	47	1,000	3	$\frac{5}{8}$	.268	16	36	240
9	$\frac{3}{4}$	.152	18	45	970	$\frac{5}{16}$	$\frac{3}{4}$	.322	16	36	160
8	$\frac{1}{2}$	.170	18	44	460	$\frac{3}{8}$	$\frac{7}{8}$	.385	16	36	90

Net Extras—For Tinned or Copper-plated, add 1c per lb. to net price. For Metallic Tinning, add 2½c per lb. to net price.

List Rebates, Applying to All Burrs in Bulk—For 25 and 50 lb. boxes deduct 2c, and for 100 and 200 lb. kegs deduct 4c per lb. from list price.

FLAT AND OVAL HEAD COPPER AND BRASS RIVETS IN BULK AND IN 5-LB. BOXES



FIG. 3545

Length measured under head.

Diam. of Shank	Length
$\frac{1}{8}$ in.	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$ in.
$\frac{3}{16}$ in.	$\frac{5}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1 in.
$\frac{1}{4}$ in.	$\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, 1¼ in.

Prices upon application.

COUNTERSUNK HEAD COPPER AND BRASS RIVETS IN BULK AND 5-LB. BOXES



No. 3546

Length measured over all.

Length	inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1¼
Diameter	inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$

Prices on application.

ASSORTED SPRING COTTERS



FIG. 3547



FIG. 3548

For the convenience of the trade, Spring Cotter are packed in several special assortments, as shown below.

Assortments Nos. 1, 2 and 3 are especially adapted for Agricultural Trade, and Assortment No. 4 for Automobile Trade.

ASSORTMENT NO. 1

Contains 100 Cotter, assorted as follows:

10 $\frac{3}{8}$ x $\frac{3}{4}$	10 $\frac{3}{16}$ x $1\frac{1}{2}$
10 $\frac{3}{8}$ x 1	10 $\frac{1}{4}$ x $1\frac{3}{4}$
10 $\frac{1}{2}$ x 1	10 $\frac{1}{4}$ x 2
10 $\frac{1}{8}$ x $1\frac{1}{4}$	10 $\frac{1}{8}$ x 2
10 $\frac{1}{16}$ x $1\frac{1}{4}$	10 $\frac{1}{16}$ x $2\frac{1}{2}$

Packed in a neat pasteboard box, twelve boxes in a carton.

No. 1. Price per box (100 Cotter). \$4.00

No. 1A. Price per carton (12 boxes) 52.00

Weight per dozen boxes, 27 lbs.

ASSORTMENT NO. 2

Contains 50 Cotter, assorted as follows:

5 $\frac{3}{8}$ x $\frac{3}{4}$	5 $\frac{1}{16}$ x $1\frac{1}{2}$
5 $\frac{3}{8}$ x 1	5 $\frac{1}{4}$ x $1\frac{3}{4}$
5 $\frac{1}{2}$ x 1	5 $\frac{1}{4}$ x 2
5 $\frac{1}{8}$ x $1\frac{1}{4}$	5 $\frac{1}{8}$ x 2
5 $\frac{1}{16}$ x $1\frac{1}{4}$	5 $\frac{1}{16}$ x $2\frac{1}{2}$

Packed in a neat pasteboard box, twelve boxes in a carton. Price, carton (12 boxes)\$26.00

Weight per dozen boxes, 11 lbs.

ASSORTMENT NO. 3

Contains 25 Cotter, assorted as follows:

3 $\frac{3}{8}$ x $\frac{3}{4}$	2 $\frac{1}{16}$ x $1\frac{1}{2}$
3 $\frac{3}{8}$ x 1	2 $\frac{1}{4}$ x $1\frac{3}{4}$
3 $\frac{1}{2}$ x 1	2 $\frac{1}{4}$ x 2
3 $\frac{1}{8}$ x $1\frac{1}{4}$	2 $\frac{1}{8}$ x 2
3 $\frac{1}{16}$ x $1\frac{1}{4}$	2 $\frac{1}{16}$ x $2\frac{1}{2}$

Packed in a neat pasteboard box, twelve boxes in a carton. Price, carton (12 boxes)\$15.00

Weight per dozen boxes, $4\frac{1}{2}$ lbs.

ASSORTMENT NO. 4

Contains 100 Cotter, assorted as follows:

10 $\frac{1}{16}$ x $\frac{1}{2}$	10 $\frac{3}{8}$ x 1
20 $\frac{1}{16}$ x $1\frac{1}{4}$	10 $\frac{3}{8}$ x $1\frac{1}{4}$
15 $\frac{3}{8}$ x $\frac{1}{2}$	15 $\frac{1}{8}$ x $\frac{3}{4}$
10 $\frac{3}{8}$ x $\frac{3}{4}$	10 $\frac{1}{8}$ x 1

Packed in round box of heavy pasteboard with metal bottom and screw top.

No. 4. Price per box 100 Cotter, \$2.00

No. 4A. Price per carton (12 boxes)\$28.00

Weight per 100 boxes, $27\frac{1}{2}$ lbs.

Always Give Assortment Number When Ordering.

SPRING COTTERS



FIG. 3549

PRICE PER 1000

Wire Gage.....	13	12	11	10	9	8	7	6
Diameter....Inches	$\frac{3}{32}$	$\frac{7}{64}$	$\frac{1}{8}$	$\frac{9}{64}$	$\frac{5}{32}$	$\frac{11}{64}$	$\frac{3}{16}$	$\frac{13}{64}$
Length $\frac{1}{2}$ inches	\$3.50	\$4.00	\$5.00	\$6.00	\$7.00	\$8.00	.....	.....
" $\frac{3}{4}$ "	4.15	4.75	5.85	7.00	8.15	9.30	\$11.10	\$12.00
" 1 "	4.80	5.50	6.70	8.00	9.30	10.60	12.80	14.00
" $1\frac{1}{4}$ "	5.45	6.25	7.55	9.00	10.45	11.90	14.50	16.00
" $1\frac{1}{2}$ "	6.10	7.00	8.40	10.00	11.60	13.20	16.20	18.00
" $1\frac{3}{4}$ "	6.75	7.75	9.25	11.00	12.75	14.50	17.90	20.00
" 2 "	7.40	8.50	10.10	12.00	13.90	15.80	19.60	22.00
" $2\frac{1}{4}$ "	.....	.....	10.95	13.00	15.05	17.10	21.30	24.00
" $2\frac{1}{2}$ "	.....	.....	11.80	14.00	16.20	18.40	23.00	26.00
" $2\frac{3}{4}$ "	.....	.....	.....	.....	.....	.....	24.70	28.00
" 3 "	.....	.....	.....	.....	.....	.....	26.40	30.00

Wire Gage.....	5	4	1	.....	.....	.....	.....
Diameter....Inches	$\frac{7}{32}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$
Length 1 inches	\$18.00	\$20.00	\$22.50	.....	.....	.....	.....
" $1\frac{1}{4}$ "	20.80	23.50	27.50	.....	.....	.....	.....
" $1\frac{1}{2}$ "	23.60	27.00	42.50	\$72.00	.....	.....	.....
" 1 $\frac{3}{4}$ "	26.40	30.50	47.50	79.20	\$108.00	.....	.....
" 2 "	29.20	34.00	52.50	86.40	119.50	\$148.50	.....
" $2\frac{1}{4}$ "	32.00	37.50	57.50	93.60	131.00	163.50	.....
" $2\frac{1}{2}$ "	34.80	41.00	62.50	100.80	142.50	178.50	.....
" $2\frac{3}{4}$ "	37.60	44.50	67.50	108.00	154.00	193.50	.....
" 3 "	40.40	48.00	72.50	115.20	165.50	208.50	\$384.00
" $3\frac{1}{4}$ "	.....	51.50	77.50	122.40	177.00	223.50	404.00
" $3\frac{1}{2}$ "	.....	55.00	82.50	129.60	188.50	238.50	424.00
" $3\frac{3}{4}$ "	.....	58.50	87.50	136.80	200.00	253.50	444.00
" 4 "	.....	62.00	92.50	144.00	211.50	268.50	464.00
" 5 "	.....	.....	.....	.....	257.50	328.50	544.00
" 6 "	.....	.....	.....	.....	.....	388.50	644.00

FLAT SPRING KEYS



FIG. 3550

Length....Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$
Width $\frac{3}{8}$ inches..	\$39.00	\$44.50	\$50.00	\$55.50	\$61.00	\$66.50	\$72.00	\$77.50	.....	.....
" $\frac{7}{16}$ " ..	52.00	58.00	64.00	70.00	76.00	82.00	88.00	94.00	.....	.....
" $\frac{1}{2}$ " ..	.....	.....	78.00	84.50	91.00	97.50	104.00	110.50	\$117.00	\$123.50
" $\frac{9}{16}$ " ..	.....	.....	.....	104.00	111.00	118.00	125.00	132.00	139.00	146.00

COPPER WIRE NAILS



FIG. 3551

DATING NAILS, for ties, timber, etc. Lettering can be changed to suit conditions.

We can also furnish

WIRE SLATING NAILS.

WIRE SHINGLE NAILS.

PACKING NAILS.

Prices upon application.

COPPER ROOFING NAILS



FIG. 3552

ROOFING NAILS, with extra large head.

No. 11 gage and heavier, 1 in. and larger.....Base

Extra for thickness, add $\frac{1}{2}$ c per pound for each number thinner than No. 11, Stubs gage.

Extras for length, 1 in. and longer, Base.

$\frac{3}{4}$ inch and $\frac{7}{8}$ inch.....	extra, $\frac{1}{2}$ c per pound
$\frac{1}{2}$ inch and $\frac{3}{4}$ inch.....	extra, 1c per pound
$\frac{3}{8}$ inch	extra, 3c per pound

Nails packed in kegs of 100 pounds each.

Packing nails in 25 pound boxes..... 8c extra

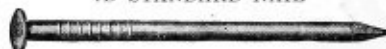
Packing nails in 50 pound boxes.....10c extra

Packing nails in 1 and 5 pound boxes.....1c pound extra

Special sizes and shapes to order.

Prices on application.

CEMENT COATED NAILS
STANDARD NAILS (FLAT HEADS) SOMETIMES CALLED "COOLERS"
 7D STANDARD NAIL

**FIG. 3553**

Standard Nails have large flat heads, and are used everywhere for crates, boxes, framing, etc. Standard Nails are used satisfactorily in automatic nailing machines, but are particularly adapted to hand driving in soft wood.

Size	Advance Over Base	Number of Nails in Keg	Length, Inches	Gage No.	Net Weight, Pounds
2d	\$0.70	85,700	1	16	79
3d	.45	54,300	1½	15½	64
4d	.30	29,800	1¾	14	61
5d	.30	25,500	1¾	13½	70
6d	.20	17,900	1¾	13	65
7d	.20	15,300	2½	12½	72
8d	.10	10,100	2¾	11½	71
9d	.10	8,900	2¾	11½	68
10d	.05	6,600	2¾	11	63
12d	.20	6,200	3¾	10	80
16d	.20	4,900	3¼	9	80
20d	.20	3,100	3¾	7	83
30d	.20	2,400	4¼	6	84
40d	.20	1,800	4¾	5	82
50d	.20	1,300	5¼	4	79
60d	.20	1,100	5¾	3	82

The count per keg of Standard Nails is guaranteed to be as listed.

COUNTERSUNK NAILS
(COUNTERSUNK HEADS) SOMETIMES CALLED "SINKERS"
 7D COUNTERSUNK NAIL

**FIG. 3554**

Countersunk Nails have heads that are reinforced by a slight countersinking. The head will not break when being driven by hand in hard wood, nor will it pull off. Countersunk Nails are also adapted to use in automatic nailing machines.

Size	Advance Over Base	Number of Nails in Keg	Length, Inches	Gage No.	Net Weight, Pounds
2d	\$0.70	85,700	1	16	79
3d	.45	54,300	1½	15½	64
4d	.30	29,800	1¾	14	61
5d	.30	25,500	1¾	13½	70
6d	.20	17,900	1¾	13	65
7d	.20	15,300	2½	12½	72
8d	.10	10,100	2¾	11½	71
9d	.10	8,900	2¾	11½	68
10d	.05	6,600	2¾	11	63
12d	.20	6,200	3¾	10	80
16d	.20	4,900	3¼	9	80
20d	.20	3,100	3¾	7	83
30d	.20	2,400	4¼	6	84
40d	.20	1,800	4¾	5	82
50d	.20	1,300	5¼	4	79
60d	.20	1,100	5¾	3	82

The count per keg of Countersunk Nails is guaranteed to be as listed.

CEMENT COATED NAILS—CONTINUED

EGG CASE NAILS

3D Egg Case Nail



FIG. 3555

Absolutely the perfect nail for egg cases, embodying every feature desired by both shippers and carriers.

Size	Advance Over Base	Number of Nails in Keg	Length, Inches	Gage No.	Net Weight, Pounds
2d	\$0.85	73,500	1	16	70
3d	.60	51,700	1 $\frac{1}{8}$	15	70
4d	.45	39,500	1 $\frac{1}{2}$	14	70

FINE NAILS

3D Fine Nail



FIG. 3556

Size	Advance Over Base	Number of Nails in Keg	Length, Inches	Gage No.	Net Weight, Pounds
2d	\$1.00	120,000	1	17 $\frac{1}{2}$	70
3d	.50	64,600	1 $\frac{1}{8}$	16	68

The count per keg of Egg Case Nails and Fine Nails is guaranteed to be as listed.

BOX NAILS

6D Box Nail



FIG. 3557

Cement Coated Box Nails being of lighter gage than Standard and Counter-sunk Nails, they are an economical and effective substitute in those instances where a greater count is preferable to more strength. Especially adapted for use in automatic nailing machines.

Size	Advance Over Base	Number of Nails in Keg	Length, Inches	Gage No.	Net Weight, Pounds
2d	\$1.00	96,200	1	16 $\frac{1}{2}$	74
3d	.70	64,600	1 $\frac{1}{8}$	16	68
4d	.50	45,500	1 $\frac{3}{8}$	15 $\frac{1}{2}$	64
5d	.50	39,700	1 $\frac{5}{8}$	15	74
6d	.35	23,600	1 $\frac{7}{8}$	13 $\frac{1}{2}$	77
7d	.35	19,300	2 $\frac{1}{8}$	13 $\frac{1}{2}$	72
8d	.25	14,000	2 $\frac{3}{8}$	12 $\frac{1}{2}$	75
9d	.25	13,100	2 $\frac{5}{8}$	12 $\frac{1}{2}$	78
10d	.15	8,900	2 $\frac{7}{8}$	11 $\frac{1}{2}$	75
12d	.35	8,700	3 $\frac{1}{8}$	11 $\frac{1}{2}$	80
16d	.35	7,100	3 $\frac{3}{8}$	11	78
20d	.35	5,200	3 $\frac{5}{8}$	10	83
30d	.35	4,600	4 $\frac{3}{8}$	10	81
40d	.35	3,500	4 $\frac{7}{8}$	9	84

The count per keg of Box Nails is guaranteed to be as listed.

CEMENT COATED NAILS—CONTINUED

4D Veneer Box Nail

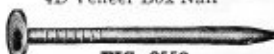


FIG. 3558

For orange boxes without hoops.

Size	Advance Over Base	Number of Nails in Keg	Length, Inches	Gage No.	Net Weight, Pounds
4d	\$0.60	30,500	1½	14	70

APPLE BOX NAILS

5D Apple Box Nail

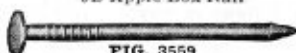


FIG. 3559

Size	Advance Over Base	Number of Nails in Keg	Length, Inches	Gage No.	Net Weight, Pounds
5d	\$0.50	31,000	1½	14	74

BERRY BOX NAILS

¾-Inch Berry Box Nail



FIG. 3560

Size	Advance Over Base	Number of Nails in Keg	Length, Inches	Gage No.	Net Weight, Pounds
¾-in.	\$1.20	140,000	¾	17	70
¾-in.	1.00	125,000	¾	17	70

The count per keg of Special Box Nails is guaranteed to be as listed.

VENEER NAILS

5D Veneer Nail

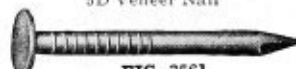


FIG. 3561

Used in 3-ply veneer packing cases.

Note—These nails are for a purpose entirely different from Veneer Box Nails, so care should be taken to specify exactly on the order the complete name of the nails wanted.

Size	Advance Over Base	Number of Nails in Keg	Length, Inches	Gage No.	Net Weight, Pounds
4d	\$0.45	19,700	1¾	12	70
5d	.45	13,000	1¾	11	70
6d	.35	9,000	1¾	10	70

BARREL NAILS

1½-Inch Barrel Nail

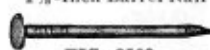


FIG. 3562

Size	Advance Over Base	Number of Nails in Keg	Length, Inches	Gage No.	Net Weight, Pounds
¾-in.	\$1.00	95,000	¾	15½	70
¾-in.	.85	67,200	¾	14½	70
1-in.	.70	55,000	1	14½	70
1¼-in.	.60	48,000	1¼	14½	70
1½-in.	.50	37,000	1½	14	70
1¾-in.	.40	26,000	1¾	13	70
2-in.	.30	24,500	2	13	70

The count per keg of Veneer Nails and Barrel Nails is guaranteed to be as listed.

CEMENT COATED NAILS—CONTINUED

SHINGLE NAILS

4D Light Shingle Nail

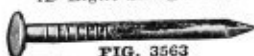


FIG. 3563

Cement Coated Shingle Nails greatly increase the effectiveness and durability of the roof by firmly holding the shingles to the roofing boards, and preventing them from warping or blowing off, thus keeping out moisture.

NOTE—In ordering, specify whether LIGHT or HEAVY Shingle Nails are wanted.

Size	Advance Over Base	LIGHT Nails in Keg	Length, Inches	Gage No.	Net Weight, Pounds
3d	\$0.45	36,500	1½	14	70
4d	.30	26,000	1¾	13	70
5d	.30	21,700	1¾	13	70
6d	.20	17,900	1¾	13	65

4D Heavy Shingle Nail

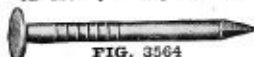


FIG. 3564

Size	Advance Over Base	HEAVY Nails in Keg	Length, Inches	Gage No.	Net Weight, Pounds
3d	\$0.45	32,500	1½	13½	70
4d	.30	22,500	1¾	12½	70
5d	.30	17,800	1¾	12½	70
6d	.20	16,600	2	12½	70

The count per keg of Coated Shingle Nails is guaranteed to be as listed.

SLATING NAILS

3D Slating Nail

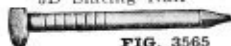


FIG. 3565

Size	Advance Over Base	Number of Nails in Keg	Length, Inches	Gage No.	Net Weight, Pounds
2d	\$0.80	35,000	1	13	70
3d	.60	22,100	1¼	12	70
4d	.40	19,000	1½	12	70
5d	.40	12,200	1¾	11	70
6d	.30	8,400	2	10	70

PLASTER BOARD NAILS

4D Plaster Board Nail

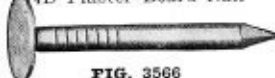


FIG. 3566

Size	Advance Over Base	Number of Nails in Keg	Length, Inches	Gage No.	Net Weight, Pounds
3d	\$0.65	12,500	1½	10	70
4d	.50	10,700	1½	10	70

The count per keg of Slating Nails and Plaster Board Nails is guaranteed to be as listed.

CEMENT COATED NAILS—CONTINUED

1½-Inch Barbed Roofing Nail

BARBED ROOFING NAILS

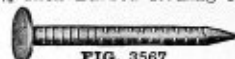


FIG. 3567

Cement Coated Barbed Roofing Nails are especially adapted for use in connection with sheet steel roofing. Their holding power being double that of the regular bright roofing nail, the durability of the roof is greatly increased.

Size	Advance Over Base	Number of Nails in Keg	Length, Inches	Gage No.	Net Weight, Pounds
¾-in.	\$0.75	61,000	¾	14	70
⅞-in.	.65	34,100	⅞	12½	70
1 -in.	.60	30,000	1	12½	70
1¼-in.	.60	28,000	1¼	12½	70
1½-in.	.55	21,500	1½	12	70
1¾-in.	.55	19,600	1¾	12	70
1⅞-in.	.45	18,200	1⅞	12	70
2 -in.	.45	16,000	2	12	70
2 ½-in.	.35	10,900	2 ½	11	70

The count per keg of Barbed Roofing Nails is guaranteed to be as listed.

SD Flooring Brad

FLOORING BRADS



FIG. 3568

Cement Coated Flooring Brads draw the boards closer than the regular uncoated flooring brads, and their greater holding power provides a much firmer floor.

Size	Advance Over Base	Number of Nails in Keg	Length, Inches	Gage No.	Net Weight, Pounds
6d	\$0.20	14,500	2	12	70
7d	.20	12,500	2¼	12	70
8d	.10	9,000	2½	11	70
9d	.10	7,800	2¾	11	70
10d	.05	5,900	3	10	70
12d	.05	4,300	3¼	9	70
16d	.05	3,450	3½	8	70
20d	Base	2,600	4	7	70

The count per keg of Flooring Brads is guaranteed to be as listed.

6D Casing Nail

CASING NAILS



FIG. 3569

Size	Advance Over Base	Number of Nails in Keg	Length, Inches	Gage No.	Net Weight, Pounds
2d	\$1.00	82,500	1	16	70
3d	.70	48,000	1¼	15	70
4d	.50	42,500	1½	15	70
5d	.50	36,000	1¾	15	70
6d	.35	19,000	2	13	70
7d	.35	16,300	2¼	13	70
8d	.25	11,800	2½	12	70
9d	.25	10,200	2¾	12	70
10d	.15	7,700	3	11	70
12d	.15	6,950	3¼	11	70
16d	.15	6,200	3½	11	70
20d	.15	4,400	4	10	70
30d	.15	3,900	4½	10	70
40d	.15	2,900	5	9	70

The count per keg of Casing Nails is guaranteed to be as listed.



FIG. 3570

**CEMENT COATED NAILS—
CONTINUED
STANDARD BRADS
8D Standard Brad**

Size	Advance Over Base	Number of Nails in Keg	Length, Inches	Gage No.	Net Weight, Pounds
2d	\$0.70	82,400	1	16	70
3d	.45	53,000	1½	15	70
4d	.30	30,000	1¾	13½	70
5d	.30	26,100	1¾	13½	70
6d	.20	17,200	1¾	12½	70
7d	.20	15,500	2¾	12½	70
8d	.10	9,400	2¾	11	70
9d	.10	8,500	2¾	11	70
10d	.05	6,250	2¾	10	70
12d	.05	5,600	3¾	10	70
16d	.05	4,200	3¾	9	70
20d	Base	2,625	3¾	7	70
30d	"	2,040	4¾	6	70
40d	"	1,540	4¾	5	70
50d	"	1,190	5¾	4	70
60d	"	910	5¾	3	70

The cost per keg of Standard Brads is guaranteed to be as listed.



FIG. 3571

**FINISHING NAILS
6D Finishing Nail**

Size	Advance Over Base	Number of Nails in Keg	Length, Inches	Gage No.	Net Weight, Pounds
2d	\$1.15	90,000	1	16½	70
3d	.85	55,000	1¼	15½	70
4d	.65	42,000	1½	15	70
5d	.65	35,000	1¾	15	70
6d	.45	20,000	2	13½	70
7d	.45	16,500	2¼	13	70
8d	.35	12,600	2½	12½	70
9d	.35	11,800	2¾	12½	70
10d	.25	8,300	3	11½	70
12d	.25	7,700	3¼	11½	70
16d	.25	6,100	3½	11	70
20d	.25	4,500	3¾	10	70

The count per keg of Finishing Nails is guaranteed to be as listed.

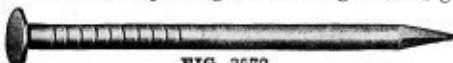


FIG. 3572

**FENCE NAILS
8D Fence Nail**

Cement Coated Fence Nails possess the double holding power of all cement coated nails, as well as greater moisture-resisting quality over uncoated or steel cut nails.

Size	Advance Over Base	Number of Nails in Keg	Length, Inches	Gage No.	Net Weight, Pounds
5d	\$0.30	12,200	1¾	11	70
6d	.20	10,500	2	11	70
7d	.20	7,800	2¼	10	70
8d	.10	7,000	2½	10	70
9d	.10	5,000	2¾	9	70
10d	.05	3,500	3	8	70
12d	.05	2,900	3¼	7	70
16d	.05	2,400	3½	6	70
20d	Base	1,750	4	5	70

The count per keg of Fence Nails is guaranteed to be as listed.

CEMENT COATED NAILS—CONTINUED

RAILROAD NAILS

8D Railroad Nail



FIG. 3573

Size	Advance Over Base	Number of Nails in Keg	Length, Inches	Gage No.	Net Wgt Pounds
2d	\$0.70	85,700	1	16	79
3d	.45	54,300	1½	15	80
4d	.30	29,800	1½	13½	76
5d	.30	25,500	1½	13½	70
6d	.20	17,900	1½	12½	77
7d	.20	15,300	2½	12½	72
8d	.10	10,100	2½	11	78
9d	.10	8,900	2½	11	77
10d	.05	6,600	2½	10	78
12d	.20	6,200	3½	10	80
16d	.20	4,900	3½	9	82
20d	.20	3,100	3½	7	85
30d	.20	2,400	4½	6	86
40d	.20	18,000	4½	5	84
50d	.20	1,300	5½	4	80
60d	.20	1,100	5½	2	86

The count per keg of Railroad Nails is guaranteed to be as listed.

BARBED CAR NAILS

7D Light Barbed Car Nail

7D Heavy Barbed Car Nail



FIG. 3574



FIG. 3575

LIGHT CAR NAILS

Oval Heads will be Furnished
unless Flat Heads are Specified.

Size	Advance over Base	Number of Nails in Keg	Length, Inches	Gage No.	Net Wgt Pounds
4d	\$0.45	25,800	1½	13	77
5d	.45	13,800	1¾	11	78
6d	.35	12,100	2	11	81
7d	.35	8,900	2¼	10	86
8d	.25	8,100	2½	10	84
9d	.25	6,300	2¾	9	85
10d	.20	5,700	3	9	87
12d	.20	4,700	3¼	8	91
16d	.20	4,300	3½	8	88
20d	.15	3,100	4	7	84
30d	.15	2,700	4½	7	87
40d	.15	2,200	5	6	90
50d	.15	1,600	5½	5	89
60d	.15	1,500	6	5	89

The count per keg of Light Barbed
Car Nails is guaranteed to be as listed.

HEAVY CAR NAILS

Oval Heads will be Furnished
unless Flat Heads are Specified.

Size	Advance over Base	Number of Nails in Keg	Length, Inches	Gage No.	Net Wgt Pounds
4d	\$0.45	17,200	1½	11	87
5d	.45	11,500	1¾	10	83
6d	.35	9,900	2	10	84
7d	.35	7,200	2¼	9	84
8d	.25	6,600	2½	9	84
9d	.25	5,300	2¾	8	85
10d	.20	4,800	3	8	86
12d	.20	3,900	3¼	7	87
16d	.20	3,100	3½	7	80
20d	.15	2,500	4	6	84
30d	.15	2,300	4½	6	86
40d	.15	1,800	5	5	88
50d	.15	1,400	5½	4	88
60d	.15	1,300	6	4	90

The count per keg of Heavy Barbed
Car Nails is guaranteed to be as listed.

Note—The base price on Railroad Nails and Barbed Car Nails is higher than
base price on all other nails shown.

STANDARD WIRE NAILS

CUTS ACTUAL SIZE

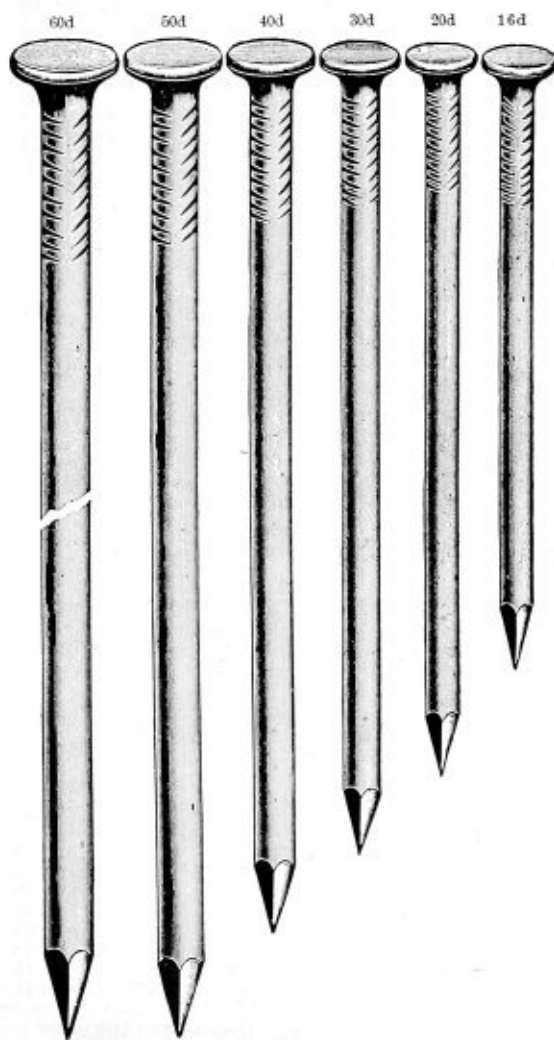


FIG. 3576

Keg contains 100 lbs. of nails, exclusive of keg. Carried only in full kegs.

STANDARD WIRE NAILS

CUTS ACTUAL SIZE

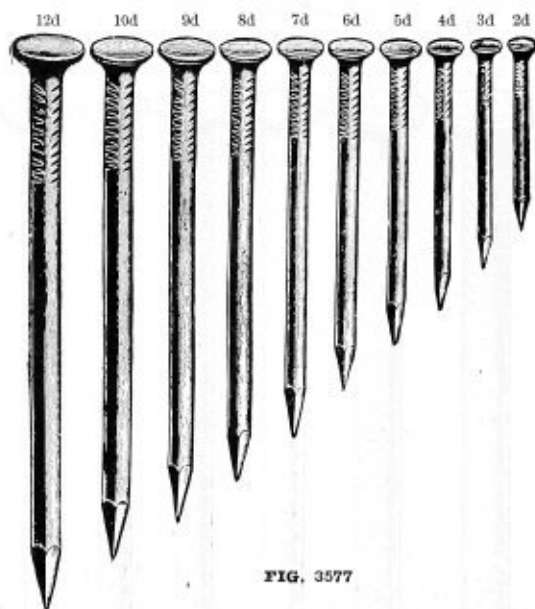


FIG. 3577

COMMON NAILS

Size	Length, Inches	Gage No.	Approx. No. to Lb.	Advance Over Base Price, Per 100 Lbs.
2d	1	15	876	\$0.70
3d	1 $\frac{1}{4}$	14	568	.45
4d	1 $\frac{1}{2}$	12 $\frac{1}{2}$	316	.30
5d	1 $\frac{3}{4}$	12 $\frac{1}{2}$	271	.30
6d	2	11 $\frac{1}{2}$	181	.20
7d	2 $\frac{1}{4}$	11 $\frac{1}{2}$	161	.20
8d	2 $\frac{1}{2}$	10 $\frac{1}{4}$	106	.10
9d	2 $\frac{3}{4}$	10 $\frac{1}{4}$	96	.10
10d	3	9	69	.05
12d	3 $\frac{1}{4}$	9	63	.05
16d	3 $\frac{1}{2}$	8	49	.05
20d	4	6	31	Base
30d	4 $\frac{1}{2}$	5	24	"
40d	5	4	18	"
50d	5 $\frac{1}{2}$	3	14	"
60d	6	2	11	"

BARBED COMMON



FIG. 3578

Size	Length, Inches	Wire Gage No.	No. to Lb.
3d	1 $\frac{1}{4}$	14	615

Add to base price per keg, 60c.

WIRE CASING NAILS

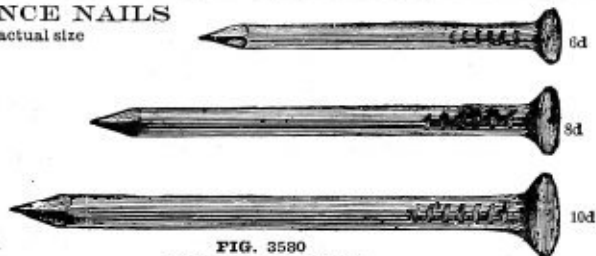
Cuts actual size

FIG. 3579
100 LBS. TO KEG

Size	Length and Gage		Approximate No. to Lb.	Advance Over Base Price
2d	1 inch	No. 15 $\frac{1}{2}$	1010	\$1.00
3d	1 $\frac{1}{4}$ "	" 14 $\frac{1}{2}$	635	.70
4d	1 $\frac{1}{2}$ "	" 14	473	.50
5d	1 $\frac{3}{4}$ "	" 14	406	.50
6d	2 "	" 12 $\frac{1}{2}$	236	.35
7d	2 $\frac{1}{4}$ "	" 12 $\frac{1}{2}$	210	.35
8d	2 $\frac{1}{2}$ "	" 11 $\frac{1}{2}$	145	.25
9d	2 $\frac{3}{4}$ "	" 11 $\frac{1}{2}$	132	.25
10d	3 "	" 10 $\frac{1}{2}$	94	.15
12d	3 $\frac{1}{4}$ "	" 10 $\frac{1}{2}$	87	.15
16d	3 $\frac{1}{2}$ "	" 10	71	.15
20d	4 "	" 9	52	.15
30d	4 $\frac{1}{2}$ "	" 9	46	.15
40d	5 "	" 8	35	.15

WIRE FENCE NAILS

Cuts actual size

FIG. 3580
100 LBS. TO KEG

Size	Length and Gage		Approximate No. to Lb.	Advance Over Base Price
5d	1 $\frac{3}{4}$ inch	No. 10	142	\$0.30
6d	2 "	" 10	124	.20
7d	2 $\frac{1}{4}$ "	" 9	92	.20
8d	2 $\frac{1}{2}$ "	" 9	82	.10
9d	2 $\frac{3}{4}$ "	" 8	62	.10
10d	3 "	" 7	50	.05
12d	3 $\frac{1}{4}$ "	" 6	40	.05
16d	3 $\frac{1}{2}$ "	" 5	30	.05
20d	4 "	" 4	23	.00

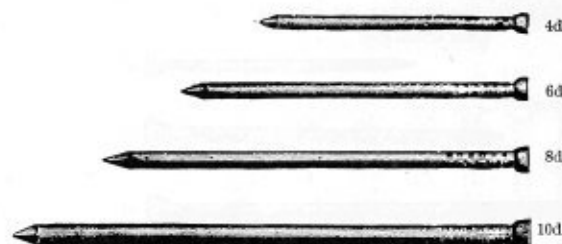


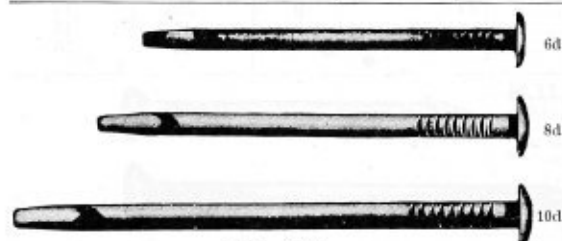
FIG. 3581

WIRE FINISHING NAILS

CUTS ACTUAL SIZE

100 LBS. TO KEG

Size	Length, Inches	Gage, No.	Approximate Number to Pound	Advance over Base Per 100 Pounds
2d	1	16½	1351	\$1.15
3d	1¼	15½	807	.85
4d	1½	15	584	.65
5d	1¾	15	500	.65
6d	2	13½	309	.45
7d	2¼	13	238	.45
8d	2½	12½	189	.35
9d	2¾	12½	172	.35
10d	3	11½	121	.25
12d	3¼	11½	113	.25
16d	3½	11	90	.25
20d	4	10	62	.25



WIRE CLINCH NAILS

CUTS ACTUAL SIZE

100 LBS. TO KEG

If bright clinch nails
are wanted, so specify in
ordering.

FIG. 3582

Size	Length, Inches	Gage, No.	Approximate Number to Pound	Advance over Base Per 100 Pounds
2d	1	14	710	\$1.05
3d	1¼	13	429	.85
4d	1½	12	274	.65
5d	1¾	12	235	.65
6d	2	11	157	.55
7d	2¼	11	139	.55
8d	2½	10	99	.45
9d	2¾	10	90	.45
10d	3	9	69	.35
12d	3¼	9	62	.35
16d	3½	8	49	.35
20d	4	7	37	.35

WIRE BARREL NAILS

CUTS ACTUAL SIZE

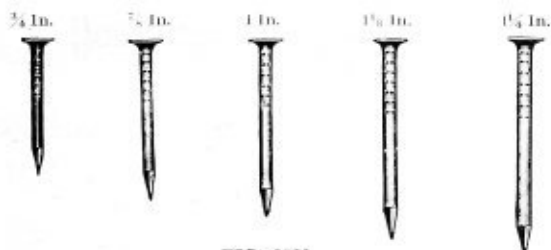


FIG. 3583

Size, Inches	Length, Inches	Gage No.	Approximate Number to Pound	Advance over Base Price
$\frac{3}{4}$	$\frac{3}{4}$	15 $\frac{1}{2}$	1346	\$1.00
$\frac{7}{8}$	$\frac{7}{8}$	14 $\frac{1}{2}$	906	.85
1.....	1	14 $\frac{1}{2}$	775	.70
1 $\frac{1}{8}$	1 $\frac{1}{8}$	14 $\frac{1}{2}$	700	.60
1 $\frac{1}{4}$	1 $\frac{1}{4}$	14	568	.50
1 $\frac{3}{8}$	1 $\frac{3}{8}$	13	400	.40
1 $\frac{1}{2}$	1 $\frac{1}{2}$	13	357	.30

100 LBS. TO KEG

FINE WIRE NAILS



FIG. 3584

Size	Length, Inches	Gage No.	Approximate Number to Pound	Advance over Base Price
2d.....	1	16 $\frac{1}{2}$	1351	\$1.00
3d.....	1 $\frac{1}{8}$	15	778	.50
4d.....	1 $\frac{1}{2}$	14	473	.35
3d extra fine.....	1 $\frac{1}{8}$	16	1015	.65

WIRE SLATING NAILS

CUTS ACTUAL SIZE

100 LBS. TO KEG

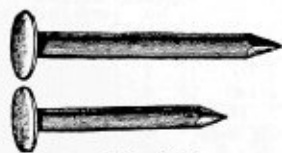


FIG. 3585

Size	Length, Inches	Gage No.	Approximate Number to Pound	Advance over Base per 100 Pounds
2d.....	1	12	411	\$0.80
3d.....	1 $\frac{1}{4}$	10 $\frac{1}{2}$	225	.60
4d.....	1 $\frac{1}{2}$	10 $\frac{1}{2}$	187	.40
5d.....	1 $\frac{3}{4}$	10	142	.40
6d.....	2	9	103	.30

SMOOTH BOX NAILS

100 LBS. TO KEG



FIG. 3586

Size	Length, In.	Gage No.	Approximate No. to lb.	Advance over Base per 100 lbs.
2d	1	15½	1010	\$1.00
3d	1¼	14½	635	.70
4d	1½	14	473	.50
5d	1¾	14	406	.50
6d	2	12½	236	.35
7d	2¼	12½	210	.35
8d	2½	11½	145	.25
9d	2¾	11½	132	.25
10d	3	10½	94	.15
12d	3½	10½	88	.15
16d	3½	10	71	.15
20d	4	9	52	.15
30d	4½	9	46	.15
40d	5	8	35	.15

ROUND DRIFT BOLTS

No. 1



FIG. 3587

No. 2



FIG. 3589

No. 3



FIG. 3588

No. 4



FIG. 3590

In ordering Drift Bolts always state what style, length and diameter is wanted.

No. 1, Plain..... per lb., \$
 " 2, Pointed..... " "

No. 3, Countersunk Head and Pointed..... per lb., \$
 No. 4, Button Head and Pointed..... per lb., \$

Any length or diameter made to order; also with or without Special Heads or Points. Quoted upon application with specifications.



FIG. 3591

WIRE SPIKES

In Ordering Spikes, Specify Chisel Points or Diamond Points, also Specify when Flat Heads are Wanted.

Size	Length, Inches	Gage No.	Approx. No. to Lb.	Advance over Base Price	Size	Length, Inches	Gage No.	Approx. No. to Lb.	Advance over Base Price
10d	3	6	41	\$0.10	60d	6	1	8	\$0.10
12d	3½	6	38	.10	7 inch	7	0	7	.10
16d	3½	5	30	.10	8 "	8	00	6	.10
20d	4	4	23	.10	9 "	9	00	5	.10
30d	4½	3	17	.10	10 "	10	⅜ inch	4	.25
40d	5	2	13	.10	12 "	12	⅝ "	3	.25
50d	5½	1	10	.10	.....	.....	.....	.....	.....

WIRE FLOORING BRADS



FIG. 3592

Size	Length, Inches	Gage No.	Approx. No. to lb.	Advance over Base per 100 lbs.
6d.....	2	11	157	\$0.20
7d.....	2 $\frac{1}{4}$	11	139	.20
8d.....	2 $\frac{1}{2}$	10	99	.10
9d.....	2 $\frac{3}{4}$	10	90	.10
10d.....	3	9	69	.05
12d.....	3 $\frac{1}{4}$	8	54	.05
16d.....	3 $\frac{3}{4}$	7	43	.05
20d.....	4	6	31	.00

WIRE SHINGLING NAILS
100 LBS. TO KEG

FIG. 3593

Size	Length, In.	Gage No.	Approximate No. to lb.	Advance over Base Price
3d.....	1 $\frac{1}{2}$	13	429	\$0.45
4d.....	1 $\frac{3}{4}$	12	274	.30
5d.....	1 $\frac{3}{4}$	12	235	.30
6d.....	2	12	204	.20
7d.....	2 $\frac{1}{4}$	11	139	.20
8d.....	2 $\frac{1}{2}$	11	125	.10
9d.....	2 $\frac{3}{4}$	11	114	.10
10d.....	3	10	83	.05

BARBED DOWEL PINS



FIG. 3594

Size Inches	Length and Gage		Approximate Number to Pound	Advance Over Base Price
	Inches	Number		
$\frac{5}{8}$	$\frac{5}{8}$	8	290	\$1.25
$\frac{3}{4}$	$\frac{3}{4}$	8	250	1.00
$\frac{7}{8}$	$\frac{7}{8}$	8	210	.85
1	1	8	190	.70
1 $\frac{1}{8}$	1 $\frac{1}{8}$	8	165	.60
1 $\frac{1}{4}$	1 $\frac{1}{4}$	8	150	.60
1 $\frac{3}{8}$	1 $\frac{3}{8}$	8	130	.60
1 $\frac{1}{2}$	1 $\frac{1}{2}$	8	120	.60

SMOOTH FOUNDRY NAILS



FIG. 3595

With square points and large, flat, thin heads.

ADVANCE OVER BASE PRICE

Length, Inches	$\frac{1}{2}$ Inch Head No. 8	$\frac{1}{2}$ Inch Head No. 9	$\frac{1}{2}$ Inch Head No. 10	$\frac{1}{4}$ Inch Head No. 11
$\frac{3}{4}$	\$0.60	\$0.70	\$0.80	\$0.90
$\frac{7}{8}$	.50	.60	.70	.80
1	.40	.50	.60	.70
$1\frac{1}{8}$	.35	.45	.55	.65
$1\frac{1}{2}$	.30	.40	.50	.60
$1\frac{3}{4}$	.25	.35	.45	.55
$1\frac{7}{8}$	.25	.35	.45	.55
2	.20	.25	.35	.45
$2\frac{1}{4}$	.15	.20	.30	.40
$2\frac{1}{2}$	.15	.20	.30	.40
$2\frac{3}{4}$	.10	.15	.25	.35
3 and longer	.05	.10	.20	.30

Barbed foundry nails, 15 cents per 100 pounds extra.

APPROXIMATE NUMBER OF WIRE NAILS
PER POUND

Wire Gage	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3
$\frac{3}{16}$										33	27	23	20	18	16	15	14
0										34	29	25	21	19	17	16	15
$\frac{1}{16}$							57	50	45	38	32	28	25	23	21	19	18
2							65	58	52	44	37	32	29	26	24	22	21
3						100	87	76	67	60	50	43	38	34	30	28	25
4						120	103	90	80	72	60	51	45	40	36	33	30
5				211	169	141	121	106	94	85	71	60	53	47	42	39	35
6				247	197	164	141	123	111	99	82	71	62	55	50	45	41
7				299	239	200	171	149	133	120	100	85	75	67	60	54	50
8				345	275	229	197	172	153	137	115	98	86	76	69	62	57
9				414	331	276	236	207	184	165	138	118	103	92	82	75	69
10		663	496	397	333	283	248	220	198	165	142	124	110	99	90	83	77
11		837	628	502	418	359	314	279	251	209	179	157	139	125	114	105	98
12		1096	822	658	548	469	411	365	329	274	235	204	182	164	149	137	127
13		1429	1072	857	714	613	536	476	429	357	306	268	238	214	195	178	168
14		2840	1893	1420	1136	947	811	710	631	568	473	406	350	315	284	258	236
15		3504	2336	1752	1402	1168	1001	876	778	701	584	500	438	389	350	.....	.....
16		4571	3048	2280	1828	1523	1305	1143	1015	913	761	653	571	508	.....	.....	.....
17		6233	4156	3116	2495	2077	1781	1558	1385	1246	1038	890	779	.....	.....	.....	.....
18		8276	5517	4138	3310	2758	2364	2069	1839	1655	1379	1182	.....	.....	.....	.....	.....
19		10668	7112	5334	4267	3556	2933	2667	2370	2133	1778	.....	.....	.....	.....	.....	.....
20	20000	15000	10000	7500	6000	5000	4400	3750	3333	3000	.....	.....	.....	.....	.....	.....	.....
21	23702	17777	11850	8888	7111	5926	5079	4444	.....	.....	.....	.....	.....	.....	.....	.....	.....
22	30476	22856	15237	11428	9143	7618	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

These counts are Average only, and the figures given may be varied either way, by changes in the dimensions of the heads or points. Brads and no-head nails will run more to the pound than table shows, and large or thick headed nails will run less.

BARBED WIRE ROOFING NAILS

CUTS ACTUAL SIZE

100 LBS. TO KEG

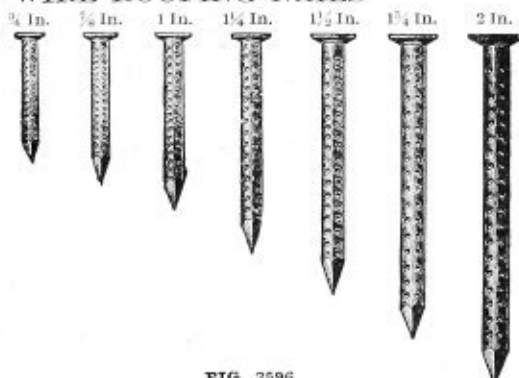


FIG. 3596

Size, Inches	Length, Inches	Gage No.	Approx. No. to lb.	Advance over Base per 100 lbs.
3/8	3/8	13	714	\$0.75
7/8	7/8	12	409	.65
1	1	12	411	.60
1 1/8	1 1/8	12	365	.60
1 1/4	1 1/4	11	251	.55
1 3/8	1 3/8	11	230	.55
1 1/2	1 1/2	10	176	.45
1 3/4	1 3/4	10	151	.45
2	2	9	103	.35



LARGE HEAD BARBED ROOFING NAILS

Diameter of head, No. 8 and No. 9 gage, approximately $\frac{1}{2}$ inch. Diameter of head, No. 10 gage, approximately $\frac{5}{16}$ inch.

FIG. 3597

Diam. of Head in.	Length and Gage In.	No.	Approx. Number to Lb.	Advance Over Base Price	Diam. of Head in.	Length and Gage In.	No.	Approx. Number to Lb.	Advance Over Base Price
1/2	3/4	8	205	\$0.65	1/2	1 1/8	9 1/2	184	\$0.55
1/2	3/4	9	252	.75	5/16	1 1/8	10	201	.60
1/2	3/4	9 1/2	266	.80	1/2	1 1/4	8	128	.35
5/16	3/4	10	290	.85	1/2	1 1/4	9	156	.45
1/2	7/8	8	179	.55	1/2	1 1/4	9 1/2	167	.50
1/2	7/8	9	219	.65	5/16	1 1/4	10	183	.55
1/2	7/8	9 1/2	231	.70	1/2	1 1/2	8	108	.30
5/16	7/8	10	253	.75	1/2	1 1/2	9	131	.40
1/2	1	8	158	.45	1/2	1 1/2	9 1/2	141	.45
1/2	1	9	193	.55	5/16	1 1/2	10	154	.50
1/2	1	9 1/2	205	.60	1/2	1 3/4	8	93	.25
5/16	1	10	224	.65	1/2	1 3/4	9	113	.35
1/2	1 1/8	8	142	.40	1/2	1 3/4	9 1/2	122	.40
1/2	1 1/8	9	173	.50	5/16	1 3/4	10	133	.45

SIMPLEX ROOFING NAILS

One piece; stem riveted both sides of head. Large heads.

List Full kegs per pound \$0.20



FIG. 3598



FIG. 3599

BOAT NAILS, LIGHT

Size	Length Inch	Gage No.	Approx. No. to Lb.	Advance over Base per 100 lbs.
4d	1 1/2	3/16	82	\$1.05
6d	2	3/16	62	.95
8d	2 1/2	3/16	50	.85
10d	3	1/4	22	.75
12d	3 1/4	1/4	20	.75
16d	3 1/2	1/4	18	.75
20d	4	1/4	16	.75

BOAT NAILS, HEAVY

4d	1 1/2	1/4	44	\$1.05
6d	2	1/4	32	.95
8d	2 1/2	1/4	26	.85
10d	3	3/8	14	.75
12d	3 1/4	3/8	13	.75
16d	3 1/2	3/8	12	.75
20d	4	3/8	10	.75

Oval Head



FIG. 3600

Countersunk Head

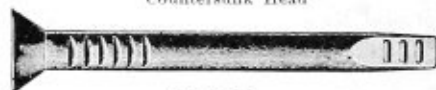


FIG. 3601

HINGE NAILS

In ordering Hinge Nails specify whether Oval or Countersunk Head, Light or Heavy. Countersunk only carried in stock.

HEAVY

Size	Length Inch	Gage No.	Approx. No. to Lb.
4d	1 1/2	3	50
6d	2	3	38
8d	2 1/2	3	30
10d	3	00	12
12d	3 1/4	00	11
16d	3 1/2	00	10
20d	4	00	9

LIGHT

4d	1 1/2	6	82
6d	2	6	62
8d	2 1/2	6	50
10d	3	3	25
12d	3 1/4	3	23
16d	3 1/2	3	22
20d	4	3	19

WIRE TACKS

BILL POSTER'S TACKS

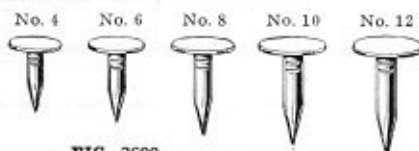


FIG. 3602

CARPET TACKS



FIG. 3603

UPHOLSTERER'S TACKS



FIG. 3604

Kind	*Size No.	1 Per 100 lbs.	1½ Per 100 lbs.	2 Per 100 lbs.	2½ Per 100 lbs.	3 Per 100 lbs.	4 Per 100 lbs.	6 Per 100 lbs.	8 Per 100 lbs.	10 Per 100 lbs.	12 Per 100 lbs.
Bill Poster's Blued	½ lb. Papers	\$	23.50	20.50	17.50	16.00	15.00	14.00	13.50	13.00	
	1, 5 and 10 lb. Pkgs.	22.50	19.50	16.50	15.00	14.00	13.00	12.50	12.00		
Bill Poster's Tinned	½ lb. Papers	31.00	25.50	21.50	19.50	18.00	17.00	16.50	16.00		
	1, 5 and 10 lb. Pkgs.	30.00	24.50	20.50	18.50	17.00	16.00	15.50	15.00		
Carpet Blued	⅛ lb. Papers	22.00	20.50	19.50	18.50	18.00	17.50				
	¼ lb. Papers	20.00	18.50	17.50	16.50	16.00	15.50				
	½ lb. Papers	18.00	16.50	15.50	14.50	14.00	13.50				
	1, 5 and 10 lb. Pkgs.	17.00	15.50	14.50	13.50	13.00	12.50				
Carpet Tinned or Coppered	⅛ lb. Papers	25.50	24.00	22.50	21.50	21.00	20.50				
	¼ lb. Papers	23.50	22.00	20.50	19.50	19.00	18.50				
	½ lb. Papers	21.50	20.00	18.50	17.50	17.00	16.50				
	1, 5 and 10 lb. Pkgs.	20.50	19.00	17.50	16.50	16.00	15.50				
Uphol- sterer's Blued	⅛ lb. Papers	\$47.00	37.00	28.50	25.50	22.50	21.00	18.00	17.00	16.50	16.00
	¼ lb. Papers	45.00	35.00	26.50	23.50	20.50	19.00	18.00	17.00	16.50	16.00
	½ lb. Papers	43.00	33.00	24.50	21.50	18.50	17.00	16.00	15.00	14.50	14.00
	1, 5 and 10 lb. Pkgs.	42.00	32.00	23.50	20.50	17.50	16.00	15.00	14.00	13.50	13.00
Uphol- sterer's Tinned	⅛ lb. Papers	62.00	47.00	36.00	30.50	26.50	24.50	21.00	20.00	19.50	19.00
	¼ lb. Papers	60.00	45.00	34.00	28.50	24.50	22.50	21.00	20.00	19.50	19.00
	½ lb. Papers	58.00	43.00	32.00	26.50	22.50	20.50	19.00	18.00	17.50	17.00
	1, 5 and 10 lb. Pkgs.	57.00	42.00	31.00	25.50	21.50	19.50	18.00	17.00	16.50	16.00

*These sizes formerly known as "oz." For example, what was formerly 1-oz., 1½-oz., 2-oz., etc., will now be known as No. 1, No. 1½, No. 2, etc.

DEDUCTIONS FROM LIST

For 25-lb. or 50-lb. boxes, deduct \$1.00 per 100 lbs. from the 1-lb., 5-lb. or 10-lb. lists.

For 100-lb. kegs, deduct \$2.00 per 100 lbs. from the 1-lb., 5-lb. or 10-lb. lists.

STEEL WIRE BRADS

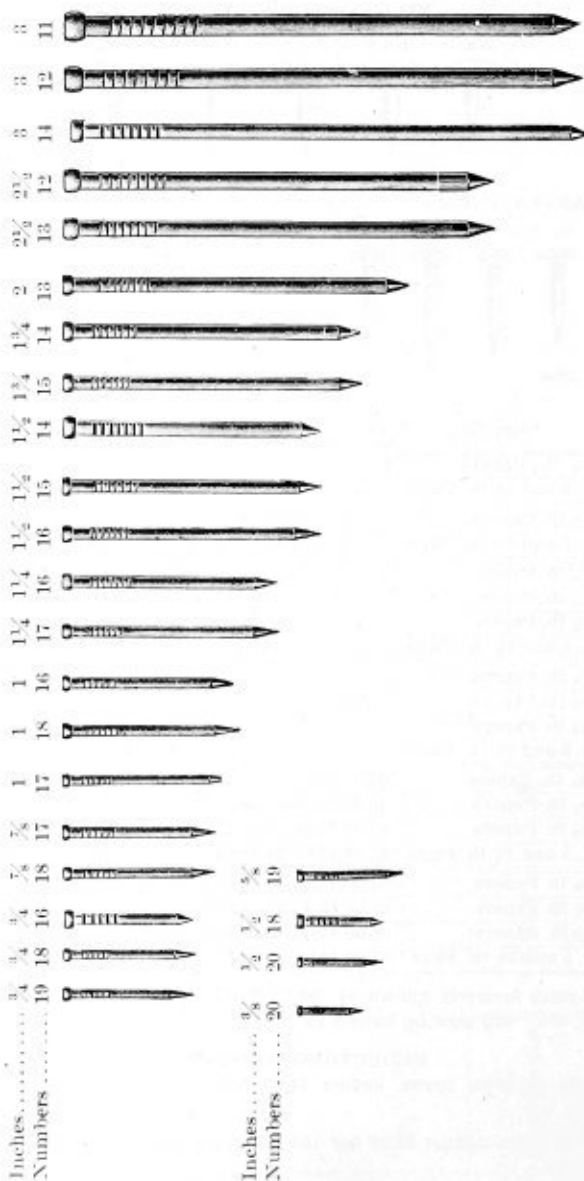


FIG. 3605

In Papers. Cuts full size.

STEEL WIRE BRADS

 $\frac{3}{8}$ TO 1 INCH—PUT UP IN $\frac{1}{4}$ LB. PAPERS

Size.....inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{1}{2}$	1	1
Wire Gage.....numbers	20	20	19	18	18	17	18	16
Approximate Number Brads to the Pound.....	10000	7500	4267	2758	2364	1781	2069	1143
Per Dozen Papers.....	\$3.24	2.79	2.19	1.80	1.59	1.53	1.53	1.32

 $1\frac{1}{4}$ TO 2 INCH—PUT UP IN $\frac{1}{4}$ LB. PAPERS

Size.....inches	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2
Wire Gage.....numbers	16	15	14	13
Approximate Number Brads to the Pound.....	913	584	406	268
Per Dozen Papers.....	\$2.28	2.10	1.98	1.92

One Dozen Papers in a Package.

PUT UP IN ONE POUND PAPERS

Size.....inches	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{1}{2}$	1	1	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$
Wire Gage.....numbers	20	19	19	18	18	17	17	16	17	16	16
Approximate Number Brads to the Pound.....	7500	4267	3556	2758	2364	1781	1558	1143	1246	913	761
Per Pound.....	\$0.85	.65	.60	.52	.45	.43	.40	.36	.39	.34	.33

Size.....inches	$1\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{3}{4}$	2	2	2	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	3
Wire Gage.....numbers	15	15	14	14	16	13	15	13	12	14
Approximate Number Brads to the Pound.....	584	500	406	350	385	268	235	214	164	150
Per Pound.....	\$0.31	.30	.29	.29	.35	.28	.30	.28	.27	.29

IN TWENTY-FIVE BOXES

Size.....inches	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{1}{2}$	1	1	$1\frac{1}{4}$	$1\frac{1}{4}$
Wire Gage....numbers	20	18	19	19	18	16	18	17	17	16	17	16
Approximate Number Brads to the Pound..	7500	7200	4267	3556	2758	2600	2364	1781	1558	1143	1246	913
Per Pound.....	\$0.84	.64	.64	.59	.51	.42	.44	.42	.39	.35	.38	.33

Size.....inches	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{3}{4}$	2	2	$2\frac{1}{2}$	$2\frac{1}{2}$	3	3	3
Wire Gage....numbers	16	15	14	15	14	14	13	13	12	14	12	11
Approximate Number Brads to the Pound..	761	584	500	500	406	350	268	214	164	150	137	105
Per Pound.....	\$0.32	.30	.29	.29	.28	.28	.27	.27	.26	.28	.26	.25

CUT NAILS IN KEGS

PRICE LIST ADOPTED DECEMBER 1, 1896

WE DO NOT CARRY ANY STEEL CUT NAILS IN HALF KEGS

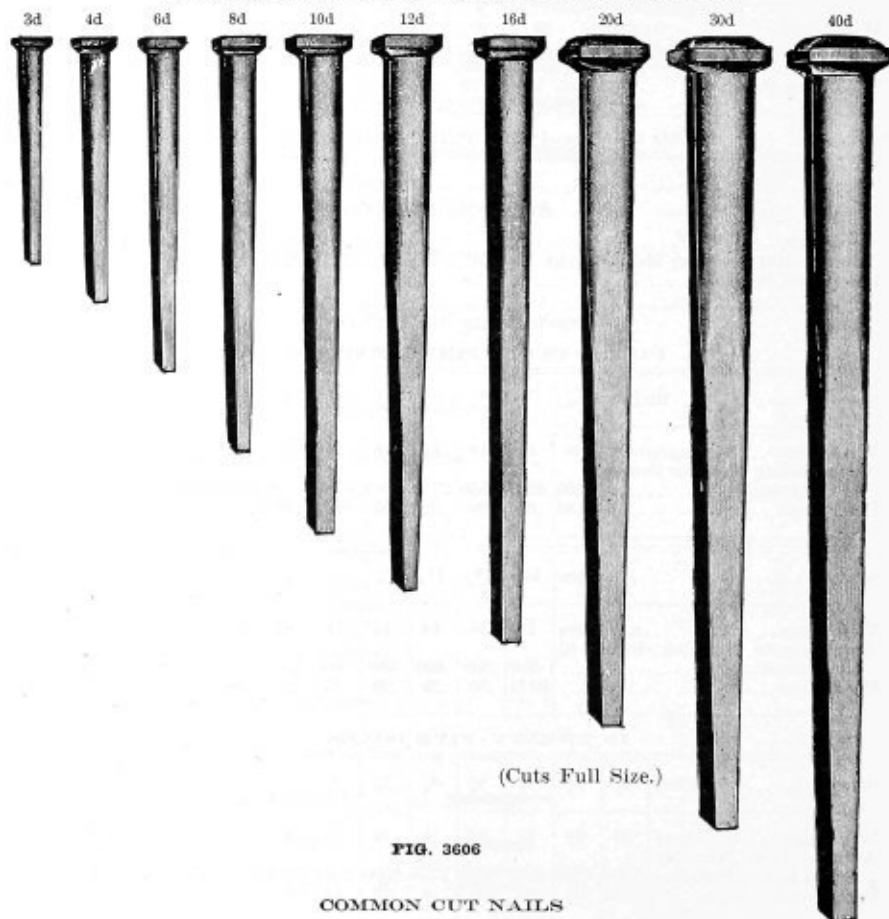


FIG. 3606

COMMON CUT NAILS

Sizes.....	3d	4d	6d	8d	10d	12d	16d	20d	30d	40d
Length, inches.....	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3	3 $\frac{1}{4}$	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$	5
Number Nails to the lb	464	296	175	88	60	48	36	24	17	14
Add to base price per keg ..	\$0.45	.30	.20	.10	.05	.05	.05	Base	Base	Base

IRON CUT SHINGLE NAILS



FIG. 3607

EDGE GRIP, LARGE HEADS

Sizes	3d	3½d	4d
Length of Nails.....inches	1¼	1⅝	1⅞
No. of Nails to the pound	360	270	200
Add to base price.....per keg	\$0.45	.40	.30

STEEL CUT CLINCH NAILS

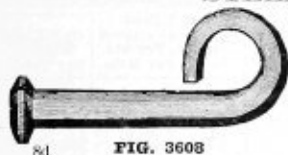


FIG. 3608

Sizes.....	6d	8d	10d
Length.....inches	2	2½	3
Number of Nails to the pound..	100	72	54
Add to base price.....per keg	\$0.65	.55	.45

STEEL CUT CASING
NAILS

FIG. 3609

Sizes	6d	8d	10d
Length.....inches	2	2½	3
Number of Nails to the pound.....	224	130	91
Add to base price.....per keg	\$0.35	.25	.15

HINGE NAILS

LARGE HEAD



FIG. 3610

Made from Specially Annealed Steel
Specially adapted for use with Strap
and T Hinges.

No. 25—COUNTERSUNK HEAD

Size.....inches	2	2½	3
Per Box of 25 Pounds.....			

Sold only in full boxes.

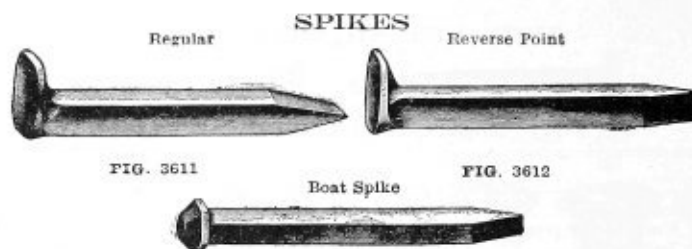


FIG. 3611
FIG. 3612
FIG. 3613
RAILROAD SPIKES

Size Under Head, Inches	Average Number Per Keg of 200 Pounds	Ties 2 Feet Between Centers 4 Spikes Per Tie Makes Per Mile		Rail Used Weight Per Yard, Pounds	Size Under Head, Inches	Average Number Per Keg of 200 Pounds	Ties 2 Feet Between Centers 4 Spikes Per Tie Makes Per Mile		Rail Used Weight Per Yard, Pounds
		Pounds	Kegs				Pounds	Kegs	
5 1/2 x 7/16	360	5920	29 1/2	45 to 100	3 1/2 x 7/16	890	2377	12	16 to 25
5 x 9/16	405	5230	26	40 to 56	4 1/2 x 3/8	930	2530	11 1/2	16 to 25
4 1/2 x 9/16	460	4606	23	35 to 40	4 x 3/8	1025	2044	10 1/2	16 to 25
5 x 1 1/2	475	4460	22 1/2	35 to 40	3 1/2 x 3/8	1250	1740	8 1/2	16 to 20
4 1/2 x 1 1/2	518	4080	20 1/2	28 to 35	3 x 3/8	1380	1592	8	16 to 20
4 x 1 1/2	605	3515	17 1/2	24 to 35	2 1/2 x 3/8	1650	1280	6 1/2	12 to 16
3 1/2 x 1 1/2	670	3180	15 1/2	20 to 30	3 x 1/2	1880	1152	5 1/2	12 to 16
4 1/2 x 7/16	690	3090	15 1/2	20 to 30	2 1/2 x 1/2	2230	948	4 1/4	8 to 12
4 x 7/16	780	2730	13 3/4	20 to 30					

RAILROAD SPIKES—EXTRAS OVER BASE

4 1/2, 5 and 5 1/2 x 9/16-inch.....	Base	2 1/2 x 3/8-inch	\$0.65
3 1/2, 4, 4 1/2 and 5 x 1/2-inch.....	\$0.15	2 1/2, 3 and 3 1/2 x 7/16-inch.....	.95
3 1/2, 4 and 4 1/2 x 7/16-inch.....	.25	2 x 1/2-inch	1.30
3, 3 1/2, 4 and 4 1/2 x 3/8-inch.....	.40	Reverse point, smallest, 3 x 3/8-inch	.25

STREET RAILWAY SPIKES—EXTRAS OVER BASE

5/8, 9/16, 1/2-in. square, countersunk head	\$0.20	3/8-in. square, countersunk head	\$0.50
7/16-in. square, countersunk head	.30	5/16-in. square, countersunk head	.75
		1/4-in. square, countersunk head	1.50

NUMBER OF BOAT SPIKES TO 200 POUND KEG

Square Diameter, Inches	Length, Inches															
	3	3 1/2	4	4 1/2	5	5 1/2	6	7	8	9	10	12	14	16		
1/4	3300	2880	2343	2200	2030	1828	1624	1420	1220	...	...	...	...	...		
5/16	...	...	1671	1364	1408	1175	1115	988	849	...	...	...	...	...		
3/8	...	...	...	1039	935	880	710	665	602	519	468	410	...	...		
7/16	...	...	...	...	...	...	562	516	453	409	369	302	...	...		
1/2	...	...	...	...	...	...	423	400	337	305	297	241	216	182		
5/8	...	...	...	...	...	...	...	...	...	...	182	155	130	122		
3/4	...	...	...	...	...	...	...	...	...	...	...	...	95	80		

Round countersunk head extra.

BOAT SPIKES—EXTRAS OVER BASE

3/4-in. square, 12 to 24 in. long..	\$0.15	3/8-in. square, 4 to 12 in. long..	\$0.30
5/8-in. square, 8 to 16 in. long..	.15	5/16-in. square, 4 to 8 in. long..	.45
1/2-in. square, 6 to 16 in. long..	.15	1/4-in. square, 4 to 8 in. long..	.75
7/16-in. square, 6 to 12 in. long..	.20	1/4-in. square, 3 to 3 1/2 in. long ..	1.00

3/8 and 1/2-inch shorter than 4 inches, .25 cwt. extra.

TRACK BOLTS

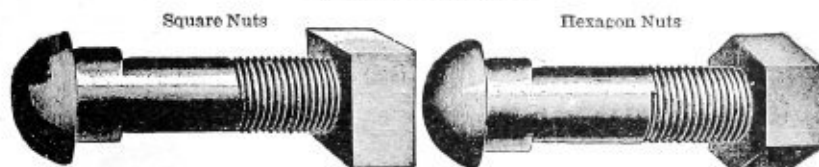


FIG. 3614

FIG. 3615

WITH U. S. STANDARD NUTS

Sizes, Inches			Square Nuts			Hexagon Nuts		
Bolts	Nuts	Rails Used	Number in Keg	Kegs. Per Mile, 4 Bolt Joint	Advances	Number in Keg	Kegs. Per Mile, 4 Bolt Joint	Advances
$\frac{7}{8} \times 4\frac{3}{4}$	$1\frac{1}{16}$	70 to 100	149	9.50	Base	158	9.10	\$0.15
$\frac{7}{8} \times 4\frac{1}{2}$	$1\frac{1}{16}$	70 " 100	155	9.20	"	163	8.83	.15
$\frac{7}{8} \times 4\frac{1}{4}$	$1\frac{1}{16}$	70 " 100	159	9.00	"	168	8.57	.15
$\frac{7}{8} \times 4$	$1\frac{1}{16}$	70 " 100	163	8.75	"	173	8.32	.15
$\frac{3}{4} \times 4\frac{3}{4}$	$1\frac{1}{4}$	45 " 85	224	7.00	"	230	6.30	.15
$\frac{3}{4} \times 4$	$1\frac{1}{4}$	45 " 85	231	6.30	"	240	6.00	.15
$\frac{3}{4} \times 3\frac{3}{4}$	$1\frac{1}{4}$	45 " 85	239	6.00	"	254	5.70	.15
$\frac{3}{4} \times 3\frac{1}{2}$	$1\frac{1}{4}$	45 " 85	240	6.00	"	260	5.50	.30
$\frac{3}{4} \times 3\frac{1}{4}$	$1\frac{1}{4}$	45 " 85	250	5.70	\$0.20	266	5.40	.40
$\frac{3}{4} \times 3$	$1\frac{1}{4}$	45 " 85	268	5.40	.30	283	5.10	.50
$\frac{5}{8} \times 3\frac{1}{2}$	$1\frac{1}{16}$	30 " 40	360	4.40	.30	375	4.00	.55
$\frac{5}{8} \times 3\frac{1}{4}$	$1\frac{1}{16}$	30 " 40	380	4.00	.35	395	3.90	.60
$\frac{5}{8} \times 3$	$1\frac{1}{16}$	30 " 40	395	3.50	.40	410	3.70	.65
$\frac{5}{8} \times 2\frac{3}{4}$	$1\frac{1}{16}$	30 " 40	420	3.40	.50	435	3.30	.75
$\frac{5}{8} \times 2\frac{1}{2}$	$1\frac{1}{16}$	30 " 40	445	3.30	.60	465	3.10	.85
$\frac{9}{16} \times 3$	$\frac{7}{8}$	20 " 30	585	2.20	.85	640	2.00	1.30
$\frac{9}{16} \times 2\frac{3}{4}$	$\frac{7}{8}$	20 " 30	620	2.10	1.00	665	2.00	1.45
$\frac{9}{16} \times 2\frac{1}{2}$	$\frac{7}{8}$	20 " 30	640	2.00	1.15	685	2.00	1.60
$\frac{9}{16} \times 2\frac{1}{4}$	$\frac{7}{8}$	20 " 30	675	2.00	1.20	725	2.00	1.75
$\frac{9}{16} \times 2$	$\frac{7}{8}$	20 " 30	700	2.00	1.35	745	2.00	1.90
$\frac{1}{2} \times 3$	$\frac{7}{8}$	20 " 30	665	2.20	.85	715	2.00	1.30
$\frac{1}{2} \times 2\frac{3}{4}$	$\frac{7}{8}$	20 " 30	695	2.10	1.00	740	2.00	1.45
$\frac{1}{2} \times 2\frac{1}{2}$	$\frac{7}{8}$	20 " 30	715	2.00	1.15	760	2.00	1.60
$\frac{1}{2} \times 2\frac{1}{4}$	$\frac{7}{8}$	20 " 30	750	2.00	1.20	800	2.00	1.75
$\frac{1}{2} \times 2$	$\frac{7}{8}$	20 " 30	775	2.00	1.35	820	2.00	1.90
$\frac{7}{16} \times 2\frac{1}{2}$	$\frac{7}{8}$	15 " 25	985	1.80	1.55	1025	1.80	2.00
$\frac{7}{16} \times 2\frac{1}{4}$	$\frac{7}{8}$	15 " 25	1090	1.60	1.75	1150	1.60	2.20
$\frac{7}{16} \times 2$	$\frac{7}{8}$	15 " 25	1190	1.40	1.95	1255	1.40	2.40
$\frac{7}{16} \times 1\frac{3}{4}$	$\frac{7}{8}$	15 " 25	1275	1.20	2.15	1360	1.20	2.60
$\frac{8}{16} \times 2\frac{1}{4}$	$1\frac{1}{16}$	8 " 16	1455	1.00	2.40	1500	1.00	2.95
$\frac{8}{16} \times 2$	$1\frac{1}{16}$	8 " 16	1560	1.00	2.65	1610	1.00	3.20
$\frac{8}{16} \times 1\frac{3}{4}$	$1\frac{1}{16}$	8 " 16	1680	1.00	2.90	1750	1.00	3.45
$\frac{8}{16} \times 1\frac{1}{2}$	$1\frac{1}{16}$	8 " 16	1800	1.00	3.15	1860	1.00	3.70
$\frac{8}{16} \times 1\frac{1}{4}$	$1\frac{1}{16}$	8 " 16	1975	1.00	3.40	2025	1.00	3.95

200 lbs. to a Keg.

STEEL SPRINGS

Cone Shape



FIG. 3616

Governor Spring,
Plain Ends

Double Coil



FIG. 3617

Single Coil



FIG. 3618



FIG. 3619

Two-Coil Bolster Springs Fitted Up in Steel Plates



Extension Spring

FIG. 3620

MADE TO ANY
SIZE AND HEIGHT
REQUIRED



FIG. 3621

AND SUITABLE
FOR ANY
CAPACITY CARS

Miscellaneous Coil Springs

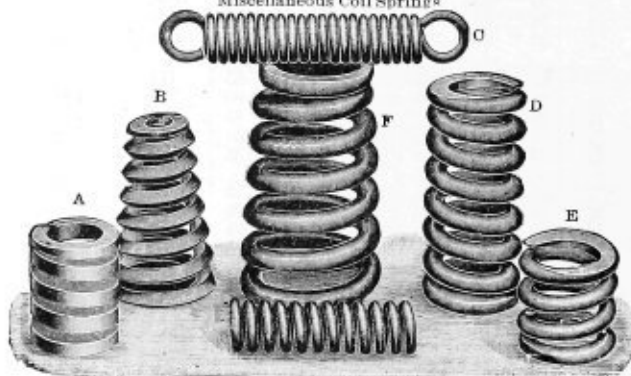
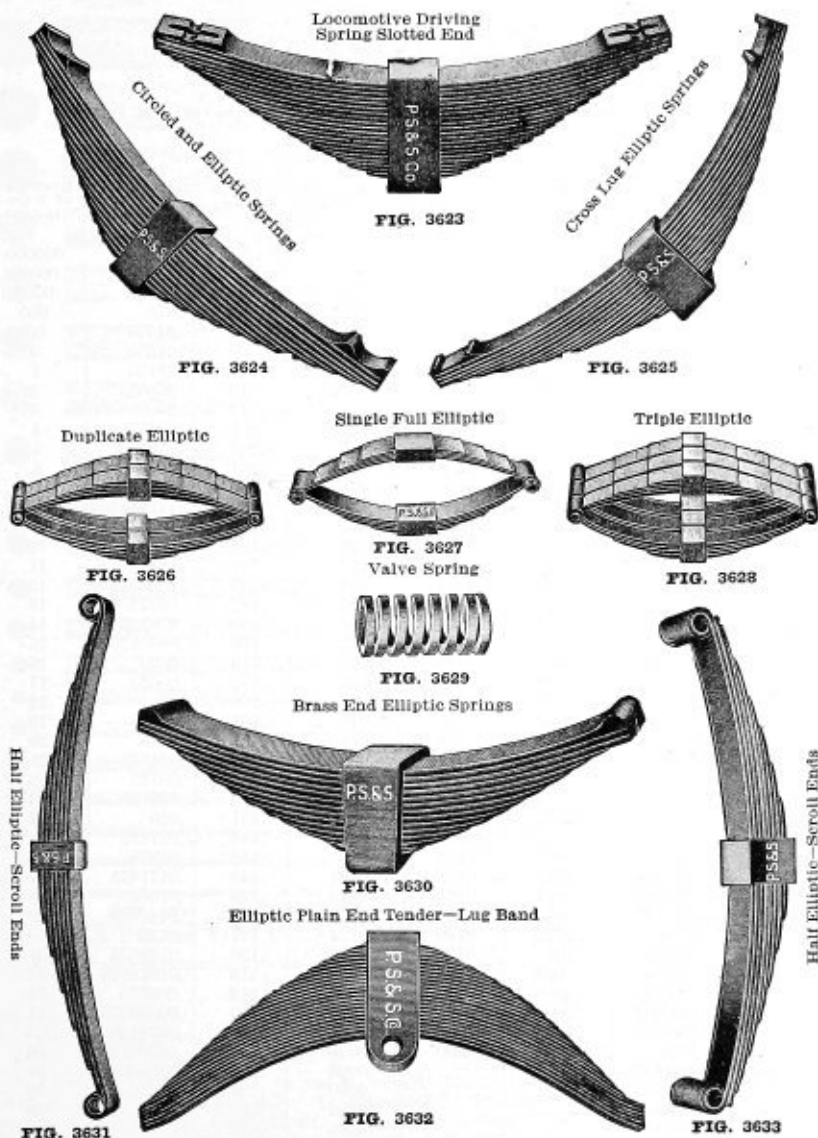


FIG. 3622

In ordering springs, give dimensions in detail. Prices on application.

STEEL SPRINGS



In ordering springs give dimensions in detail. Prices on application.

DIFFERENT STANDARDS FOR WIRE GAGE IN USE IN

THE UNITED STATES

DIMENSIONS OF SIZES IN DECIMAL PARTS OF AN INCH

Number of Wire Gauge	American or Brown & Sharpe	Birmingham or Stubs' Wire	Washburn & Moen Mfg. Co.	Imperial Wire Gauge	Stubs' Steel Wire	U. S. Standard for Plate	Number of Wire Gauge
000000				.464		.46875	000000
00000				.432		.4375	00000
0000	.46	.454	.3938	.400		.40625	0000
000	.40964	.425	.3625	.372		.375	000
00	.3648	.38	.3310	.348		.34375	00
0	.32486	.34	.3065	.324		.3125	0
1	.2893	.3	.2830	.300	.227	.28125	1
2	.25763	.284	.2625	.276	.219	.265625	2
3	.22942	.259	.2437	.252	.212	.25	3
4	.20431	.238	.2253	.232	.207	.234575	4
5	.18194	.22	.2070	.212	.204	.21875	5
6	.16202	.203	.1920	.192	.201	.203125	6
7	.14428	.18	.1770	.176	.199	.1875	7
8	.12849	.165	.1620	.160	.197	.171875	8
9	.11443	.148	.1483	.144	.194	.15625	9
10	.10189	.134	.1350	.128	.191	.140625	10
11	.090742	.12	.1205	.116	.188	.125	11
12	.080808	.109	.1055	.104	.185	.109375	12
13	.071961	.095	.0915	.092	.182	.09375	13
14	.064084	.083	.0800	.080	.180	.078125	14
15	.057068	.072	.0720	.072	.178	.0630125	15
16	.05082	.065	.0625	.064	.175	.0625	16
17	.045257	.058	.0540	.056	.172	.05625	17
18	.040303	.049	.0475	.048	.168	.05	18
19	.03589	.042	.0410	.040	.164	.04375	19
20	.031961	.035	.0348	.036	.161	.0375	20
21	.028462	.032	.03175	.032	.157	.034375	21
22	.025347	.028	.0286	.028	.155	.03125	22
23	.022571	.025	.0258	.024	.153	.028125	23
24	.0201	.022	.0230	.022	.151	.025	24
25	.0179	.02	.0204	.020	.148	.021875	25
26	.01594	.018	.0181	.018	.146	.01875	26
27	.014195	.016	.0173	.0164	.143	.0171875	27
28	.012641	.014	.0162	.0149	.139	.015625	28
29	.011257	.013	.0150	.0136	.134	.0140625	29
30	.010025	.012	.0140	.0124	.127	.0125	30
31	.008928	.01	.0132	.0116	.120	.0109375	31
32	.00795	.009	.0128	.0108	.115	.01015625	32
33	.00708	.008	.0118	.0100	.112	.009375	33
34	.006304	.007	.0104	.0092	.110	.00859375	34
35	.005614	.005	.0095	.0084	.108	.0078125	35
36	.005	.004	.0090	.0076	.106	.00703125	36
37	.004453			.0068	.103	.006640625	37
38	.003965			.0060	.101	.00625	38
39	.003531			.0052	.099		39
40	.003144			.0048	.097		40

SMOOTH STEEL WIRE

Full Sizes of Plain Wire		Steel Wire Gauge No.	Sizes of Wire		Weight One Mile Pounds	Pounds per Foot	Feet to Pound
			Common Fractions	Decimally			
		1		.2830	1128.0	.2136	4.681
		2	$\frac{3}{32}$	.28125	1114.0	.211	
		3	$\frac{1}{4}$	.2625	970.4	.1838	5.441
		4		.250	880.2	.1667	
		5		.2437	836.4	.1584	6.313
		6	$\frac{5}{32}$	.2253	714.8	.1354	7.386
		7		.21875	673.9	.1276	
		8		.2070	603.4	.1143	8.750
		9	$\frac{3}{16}$	.1920	519.2	.0983	10.17
		10		.1875	495.1	.0937	
		11		.1770	441.2	.0835	11.97
		12	$\frac{5}{32}$	.1620	369.6	.070	14.29
		13		.15625	343.8	.0651	
		14		.1483	309.7	.0586	17.05
		15	$\frac{1}{8}$	.1350	256.7	.0486	20.57
		16		.1250	220.0	.0416	
		17		.1205	204.5	.0387	25.82
		18	$\frac{3}{16}$	.1055	156.7	.0296	33.59
		19		.09375	123.8	.0234	
		20		.0915	117.9	.0223	44.78
			$\frac{1}{4}$	.0800	90.13	.0170	58.58
				.0720	73.01	.0138	72.32
			$\frac{5}{16}$	.0625	55.0	.0104	95.98
				.0540	41.07	.0077	128.6
				.0475	31.77	.006	166.2
				.0410	23.67	.0044	223.0
				.0348	17.05	.0032	309.6

FIG. 3634

EXTRAS ON PLAIN FENCE WIRE IN COILS
PER 100 POUNDS

		Nos. 6 to 9	10	11	12 and 12½	13	14	15	16
For Annealed Wire	Base	\$0.05	\$0.10	\$0.15	\$0.25	\$0.35	\$0.45	\$0.55	
For Galvanized Wire,									
add to Price of Annealed		\$0.70	.70	.70	.70	.70	.70	1.05	1.05

Annealed Baling Wire, in catch weight bundles, 10 cents per 100 lbs. extra over plain annealed fence wire. In even weight bundles, a further extra of 5 cents per bundle. Special Galvanized, extra over ordinary galvanized, per 100 lbs.: No. 14 and coarser, 50 cents; Nos. 15 and 16, \$1.00. Even Weight Bundles, 5 cents per bundle extra, except 100-lb. bundles, which are considered standard and take no extra charge.

SPOOL WIRE

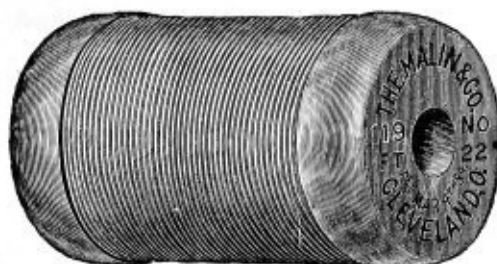


FIG. 3636

ANNEALED STEEL WIRE
PER DOZEN

Gauge.....	16	17	18	19	20	21	22	23
2 -ounce.....	\$0.64	\$0.64	\$0.64	\$0.68	\$0.68	\$0.72	\$0.73	\$0.74
$\frac{3}{4}$ -pound.....	.96	.96	.96	1.02	1.02	1.08	1.10	1.12
$\frac{1}{2}$ ".....	1.58	1.60	1.64	1.66	1.68	1.74	1.80	1.86
1 ".....	2.46	2.56	2.64	2.68	2.76	2.86	2.96	3.05
Gauge.....	24	25	26	27	28	29	30	
2 -ounce.....	\$0.76	\$0.79	\$0.80	\$0.80	\$0.81	\$0.84	\$0.89	.....
$\frac{3}{4}$ -pound.....	1.14	1.18	1.20	1.20	1.22	1.26	1.34	.....
$\frac{1}{2}$ ".....	1.94	2.00	2.04	2.06	2.13	2.21	2.35	.....
1 ".....	3.15	3.20	3.30	3.53	3.65	3.78	4.03	.....

ANNEALED TINNED STEEL WIRE
PER DOZEN

Gauge.....	16	17	18	19	20	21	22	23
2 -ounce.....	\$0.80	\$0.80	\$0.80	\$0.83	\$0.83	\$0.85	\$0.88	\$0.91
$\frac{3}{4}$ -pound.....	1.20	1.20	1.20	1.25	1.25	1.28	1.32	1.36
$\frac{1}{2}$ ".....	2.08	2.11	2.13	2.18	2.18	2.30	2.36	2.42
1 ".....	3.50	3.58	3.64	3.70	3.75	3.90	4.00	4.10
Gauge.....	24	25	26	27	28	29	30	
2 -ounce.....	\$0.93	\$0.97	\$1.00	\$1.05	\$1.10	\$1.15	\$1.19	.....
$\frac{3}{4}$ -pound.....	1.40	1.45	1.50	1.58	1.65	1.72	1.78	.....
$\frac{1}{2}$ ".....	2.48	2.55	2.60	2.77	2.89	3.00	3.11	.....
1 ".....	4.20	4.40	4.50	4.75	4.95	5.15	5.33	.....

SOFT BRASS WIRE
PER DOZEN

Gauge.....	16	17	18	19	20	21	22	23
2 -ounce.....	\$1.47	\$1.47	\$1.47	\$1.47	\$1.47	\$1.53	\$1.60	\$1.67
$\frac{3}{4}$ -pound.....	2.20	2.20	2.20	2.20	2.20	2.30	2.40	2.50
$\frac{1}{2}$ ".....	3.90	3.90	3.90	3.90	3.90	4.20	4.40	4.60
1 ".....	7.50	7.50	7.50	7.50	7.50	8.00	8.20	8.50
Gauge.....	24	25	26	27	28	29	30	
2 -ounce.....	\$1.73	\$1.80	\$1.80	\$2.08	\$2.31	\$2.46	\$2.80	.....
$\frac{3}{4}$ -pound.....	2.60	2.70	2.70	3.12	3.46	3.62	4.20	.....
$\frac{1}{2}$ ".....	4.70	4.80	4.90	5.52	6.12	6.48	7.44	.....
1 ".....	8.60	9.00	9.20	10.34	11.48	12.14	13.94	.....

CAST STEEL MUSIC WIRE

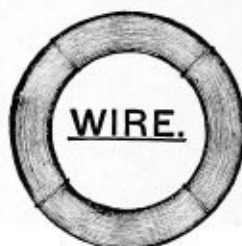


FIG. 3637

Number	Diameter	Feet Per Pound	List Price Per Pound	Number	Diameter	Feet Per Pound	List Price Per Pound
0000000	.003	39000	Prices on request	22	.049	156	\$1.20
0000000	.004	23433		23	.051	144	1.20
000000	.005	14997		24	.055	124	1.20
0000	.006	10415		25	.059	108	1.20
000	.007	7652		26	.063	94	1.20
00	.008	5858	\$12.00	27	.067	83	1.20
0	.009	4629	9.00	28	.071	74	1.20
1	.010	3749	7.50	29	.075	68	1.20
2	.011	2936	6.00	30	.080	58	1.20
3	.012	2604	5.00	31	.083	54	1.20
4	.013	2218	4.00	32	.086	51	1.20
5	.014	1913	3.50	33	.091	46	1.20
6	.016	1465	3.00	34	.094	43	1.20
7	.018	1157	2.75	35	.098	39	1.20
8	.020	927	2.50	36	.102	36	1.20
9	.022	775	2.25	37	.106	34	1.20
10	.024	651	2.00	38	.110	32	1.20
11	.026	560	1.80	39	.114	29	1.20
12	.029	447	1.80	40	.118	27	1.20
13	.031	391	1.60	$\frac{1}{8}$ "	.125	24	1.20
14	.033	344	1.60	$\frac{7}{16}$ "	.140	20	1.20
15	.035	305	1.60	$\frac{1}{2}$ "	.156	16	1.20
16	.037	274	1.40	$\frac{9}{16}$ "	.172	12	1.20
17	.039	247	1.40	$\frac{5}{8}$ "	.187	10	1.20
18	.041	223	1.40	$\frac{3}{4}$ "	.218	8	1.20
19	.043	203	1.20	$\frac{7}{8}$ "	.250	* 5 $\frac{1}{2}$	1.20
20	.045	185	1.20	$\frac{1}{2}$ "	.281	4 $\frac{3}{4}$	1.20
21	.047	170	1.20	$\frac{1}{2}$ "	.3125	4	1.20
				$\frac{3}{8}$ "	.375	2 $\frac{2}{3}$	1.20

Music Wire Gage is different from all other gages.

Order from above numbers.

GUARANTEED FULL WEIGHT COILS.

"PITTSBURGH PERFECT" BALE TIES



FIG. 3638

Standard List Prices—Per Bundle of 250
Ties—Adopted January 2, 1907Approximate Weight of Single Loop Bale
Ties Per Bundle of 250 Ties

Length in Feet	No. 12 Wire					Length in Feet	Sizes, Pittsburgh Steel Company Gauge				
	No. 12	No. 13	No. 14	No. 15	No. 16		No. 12	No. 13	No. 14	No. 15	No. 16
5	\$ 5.47	\$4.46	\$3.66	\$3.19	\$2.63	5	40.2	30.2	22.8	18.4	13.8
5½	5.70	4.64	3.80	3.32	2.72	5½	42.1	31.6	23.8	19.3	14.4
5½	5.92	4.82	3.94	3.44	2.82	5½	43.9	33.0	24.9	20.2	15.1
5¾	6.16	5.00	4.10	3.56	2.91	5¾	45.8	34.4	26.0	21.0	15.7
6	6.38	5.18	4.23	3.69	3.01	6	47.6	35.8	27.0	21.9	16.4
6¼	6.61	5.36	4.38	3.82	3.10	6¼	49.5	37.2	28.1	22.8	17.0
6½	6.83	5.54	4.53	3.93	3.21	6½	51.3	38.6	29.2	23.6	17.7
6¾	7.06	5.72	4.67	4.06	3.30	6¾	53.2	40.0	30.2	24.5	18.3
7	7.29	5.90	4.82	4.19	3.41	7	55.1	41.4	31.3	25.4	19.0
7¼	7.51	6.09	4.97	4.31	3.50	7¼	56.9	42.8	32.4	26.2	19.6
7½	7.74	6.27	5.10	4.44	3.60	7½	58.8	44.2	33.4	27.1	20.3
7¾	7.97	6.45	5.26	4.56	3.71	7¾	60.6	45.6	34.5	28.0	21.0
8	8.20	6.63	5.40	4.68	3.81	8	62.5	47.0	35.6	28.8	21.7
8¼	8.42	6.81	5.54	4.81	3.92	8¼	64.3	48.4	36.6	29.7	22.4
8½	8.65	6.99	5.69	4.92	4.01	8½	66.2	49.8	37.7	30.5	23.0
8¾	8.87	7.17	5.84	5.05	4.11	8¾	68.0	51.2	38.8	31.4	23.7
9	9.10	7.35	5.97	5.18	4.20	9	69.9	52.6	39.8	32.3	24.3
9¼	9.33	7.54	6.13	5.29	4.31	9¼	71.7	54.0	40.9	33.1	25.0
9½	9.56	7.72	6.28	5.42	4.40	9½	73.6	55.4	42.0	34.0	25.6
9¾	9.79	7.90	6.41	5.55	4.50	9¾	75.5	56.8	43.0	34.9	26.3
10	10.01	8.08	6.56	5.67	4.59	10	77.3	58.2	44.1	35.7	26.9
10¼	10.24	8.26	6.71	5.79	4.69	10¼	79.2	59.6	45.2	36.6	27.6
10½	10.46	8.42	6.85	5.92	4.78	10½	81.0	60.9	46.2	37.5	28.2
10¾	10.69	8.60	7.00	6.03	4.90	10¾	82.9	62.3	47.3	38.3	28.9
11	10.92	8.79	7.15	6.17	4.98	11	84.7	63.7	48.4	39.2	29.5
11¼	11.15	8.97	7.28	6.28	5.09	11¼	86.6	65.1	49.4	40.0	30.2
11½	11.38	9.15	7.43	6.41	5.18	11½	88.5	66.5	50.5	40.9	30.8
11¾	11.60	9.33	7.58	6.54	5.28	11¾	90.3	67.9	51.6	41.8	31.5
12	11.83	9.51	7.72	6.65	5.38	12	92.2	69.3	52.6	42.6	32.1

To get the length of Tie required, add three inches to the measure around the bale when under pressure.

STANDARD BALES

Standard Small Bales.....	{ 14 x 18 x 36 inches 16 x 18 x 36 inches
Standard Medium Bales.....	
Standard Large Bales.....	{ 17 x 22 x 36 inches 22 x 28 x 46 inches

For 17 x 22 Perpetual Presses, use Ties 8, 8½ or 9 feet long. No. 14 wire for heavy work, and No. 15 for light work.

For 14 x 18 Perpetual Presses, use Ties, 8, 8¼ or 8½ feet long. No. 14 wire for extra or extreme heavy work, No. 15 for heavy and medium work, and No. 16 for light work.

For Upright Hand Presses, use No. 14 and No. 15 wire.

For Upright Light Horse Presses, use No. 14 wire.

For Upright Heavy Portable or Light Stationary Horse Presses, use No. 13 wire.

For Upright Heavy Stationary and Beater Presses, use No. 10, No. 11 and No. 12 wire, according to the size of bale and number of Ties used.



FIG. 3642

WIRE FENCE STAPLES

Bright or Galvanized, all made of No. 9 wire. Put up in kegs containing 100 pounds.

Length	$\frac{3}{4}$	$\frac{7}{8}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2
No. to Pound.	132	120	108	96	87	72	65

Staples cut from wire smaller than No. 9, price as follows:

Cut from No. 10 wire, 16 cents, advance.

Cut from No. 11 wire, 20 cents, advance.

Cut from No. 12 wire, 35 cents, advance.

Cut from No. 13 wire, 60 cents, advance.



FIG. 3643

POULTRY NETTING STAPLES

Made from No. 14 Galvanized Wire.

Length, inches	$\frac{3}{4}$	$\frac{7}{8}$	1
Number to Pound.....	480	416	352

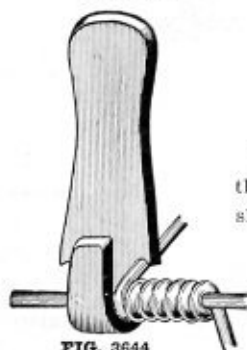


FIG. 3644

"PITTSBURGH PERFECT" WIRE SPLICER

The simplest and handiest splicer on the market. With this tool, splices are quickly and easily made without the slightest injury to the galvanizing.

List Price, 75 cents per doz.

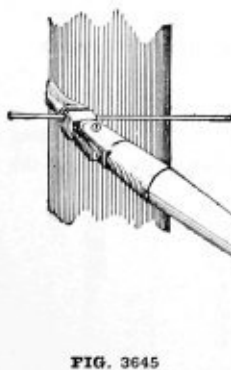


FIG. 3645

"PITTSBURGH PERFECT" SMOOTHGRIP WIRE STRETCHER

Has perfectly smooth curved jaws. There are no teeth to cut or injure the wire. Made of malleable iron.

Absolutely the best Barbed Wire Stretcher in the world.

List Price, complete with Hickory Handle, \$1.25 each.

IMPROVED AMERICAN DOUBLE JACK
FENCE STRETCHER

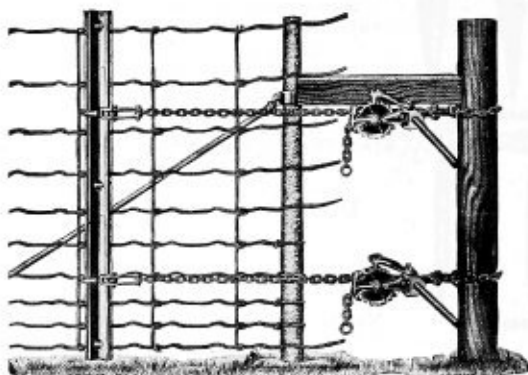


FIG. 3346

The American Double Jack Stretcher combines all the important features of a fence stretcher—Simplicity, Strength, and Safety.

It is made entirely of steel, therefore, strong and durable.

Its angle bars, or clamp bars, are rounded in such a way as to prevent injury to the wire during the stretching.

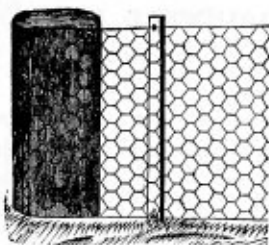
Only three bolts on clamp bars—which can be easily and quickly tightened.

It can be operated by one person.

This Stretcher consists of one pair of clamp bars, two jacks or stretching heads, two sets of chains and two levers, which makes it possible to stretch the fence at top or bottom, as desired.

Shipping weight approximately 105 pounds.

Prices upon application.



HEXAGON POULTRY NETTING

GALVANIZED

Galvanized before weaving.

Galvanized after weaving.

FIG. 3647

STOCK SIZES

20 WIRE

Mesh, Inches	Description	List, Per Square Foot
2	Width, Inches	12, 18, 24, 30, 36, 48, 60, 72
	Weight, per Roll, Pounds	9, 14, 18, 23, 27, 36, 45, 54
1	Width, Inches	12, 24, 36, 48
	Weight, per Roll, Pounds	18, 36, 54, 72
3/4	Width, Inches	12, 24, 36, 48
	Weight, per Roll, Pounds	21, 41, 62, 83

NO. 10 WIRE

2	Width, Inches	12, 18, 24, 30, 36, 48, 60, 72
	Weight, per Roll, Pounds	12, 17, 23, 29, 34, 46, 57, 68
3/4	Width, Inches	30, 36
	Weight, per Roll, Pounds	73, 88

NO. 16 WIRE

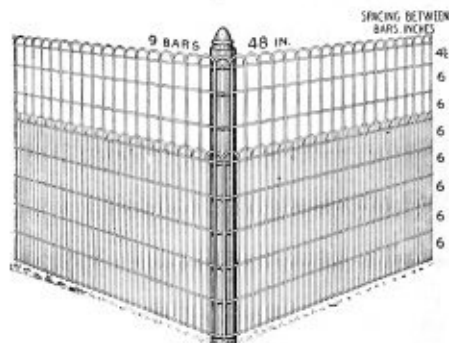
2	Width, Inches	24, 36, 48, 60, 72
	Weight, per Roll, Pounds	44, 68, 88, 100, 132

Put up in rolls of 150 lineal feet. Weights are approximate.

STANDARD LIST OF POULTRY NETTING

Size Mesh, Inches	Gage Wire, Number	List, Per Square Foot	Size Mesh, Inches	Gage Wire, Number	List, Per Square Foot
3	13	\$0.08 3/4	2	19	\$0.02 1/2
3	14	.06	2	20	.02 3/4
3	15	.05 3/8	1 1/2	16	.08 3/4
3	16	.04 1/2	1 1/2	17	.07 1/4
3	17	.03 1/2	1 1/2	18	.04 1/2
3	18	.02 1/2	1 1/2	19	.03 1/2
3	19	.02	1 1/2	20	.03
3	20	.01 3/4	1 1/4	16	.11
2 1/2	13	.10 3/4	1 1/4	17	.08 3/4
2 1/2	14	.08	1 1/4	18	.06
2 1/2	15	.06 3/4	1 1/4	19	.05
2 1/2	16	.04 1/4	1 1/4	20	.04 1/4
2 1/2	17	.03 1/4	1	16	.14
2 1/2	18	.02 1/4	1	17	.10
2 1/2	19	.02 1/8	1	18	.07 1/4
2 1/2	20	.02	1	19	.05 1/2
2	14	.06 1/2	1	20	.12 1/2
2	15	.07 1/4	3/4	18	.10 3/4
2	16	.05 1/2	3/4	19	.09
2	17	.04 1/2	3/4	20	.08 1/4
2	18	.03 1/4	3/4	21	

**"PITTSBURGH PERFECT" ORNAMENTAL LAWN FENCE
WITH DOUBLE SCROLL**



Made entirely of No. 9 gage wire.
Three heights, 36 in., 42 in., 48 in.
Horizontal wires, 6 in. apart except two upper wires which are 4½ in. apart.

Upper pickets, 2¾ in. apart, lower pickets, 1¾ in. apart. Put up in rolls of 100 and 150 lineal or running feet. When ordering always specify what sized rolls are wanted.

FIG. 3648

**SPECIAL NO. 9 ORNAMENTAL LAWN FENCE
WITH DOUBLE SCROLL**

Style Number	Number of Bars	Height, Inches	Inches Between Upper Pickets	Inches Between Lower Pickets	Approx. Weight per Foot	List Price Per Lineal or Running Foot
736x	7	36	2¾	1¾	1.69	20c
842x	8	42	2¾	1¾	1.98	22c
948x	9	48	2¾	1¾	2.27	25c

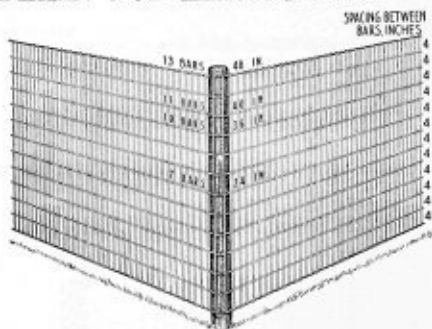
Full sizes of wires used



NO. 11 CLOSE MESH PLAIN TOP LAWN FENCE

Made entirely of No. 11 Gage Wire. Four heights, 24 in., 36 in., 40 in. and 48 in.

Horizontal wires, 4 in. apart. Picket wires, 1¾ in. apart. Non-climbable. Put up in rolls of 100 and 150 lineal or running feet. When ordering always specify what sized rolls are wanted.

**FIG. 3649**

**NO. 11 CLOSE MESH PLAIN TOP LAWN FENCE
Stays 1¾ Inches Apart.**

Style No.	Number of Bars	Height in Inches	Inches Between Stays	Weight per 100 Feet	List Price per Lineal or Running Foot
724	7	24	1¾	78 lbs.	11c
1036	10	36	1¾	112 lbs.	16c
1140	11	40	1¾	124 lbs.	17c
1348	13	48	1¾	147 lbs.	20c

Full sizes of wires used



"PITTSBURGH PERFECT" GATES

ELECTRICALLY WELDED PIPE FRAME CONSTRUCTION

Plain Top

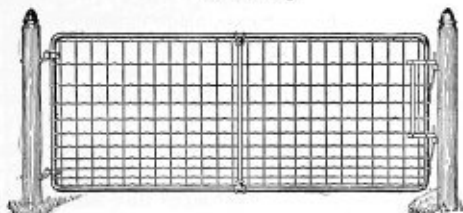


FIG. 3650

"Pittsburgh Perfect" Single Drive Gates furnished complete with latches and hinges for wooden posts. 34 inch and 42 inch gates have single latches. 50 and 58 inch gates have single action double latches (see cut).

For Single Drive and Yankee Gates covered with Plain or Ornamental Top Lawn Fence, add \$1.00 to net price.

Size Ft. In.	Approx. Weight	List Prices		Size Ft. In.	Approx. Weight	List Prices	
		Plain Top	Orna- mental Top			Plain Top	Orna- mental Top
10x34	64	\$5.15	\$5.90	12x50	85	\$6.55	\$7.30
10x42	69	5.50	6.25	12x58	88	6.95	7.70
10x50	75	5.85	6.60	14x34	79	6.25	7.00
10x58	77	6.25	7.00	14x42	81	6.60	7.35
12x34	73	5.75	6.50	14x50	85	7.05	7.80
12x42	77	6.10	6.85	14x58	93	7.50	8.25

YANKEE GATES

ELECTRICALLY WELDED PIPE FRAME CONSTRUCTION

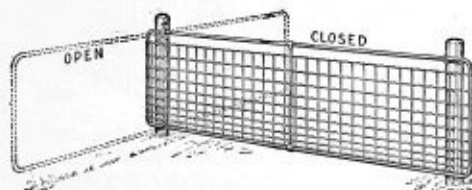


FIG. 3651

Yankee Gates furnished complete with hooks and pulleys for wooden posts.

Unless otherwise ordered, gates will be covered with No. 9 Farm Fence (all No. 9 wire), stays 6 inches apart.

48 inches high—14 feet 10 inches long for 14 foot opening, weight 85 lbs., each, \$8.50
48 inches high—16 feet 10 inches long for 16 foot opening, weight 90 lbs., each, 9.20

"PITTSBURGH PERFECT" Ornamental and Plain Top LAWN FENCES

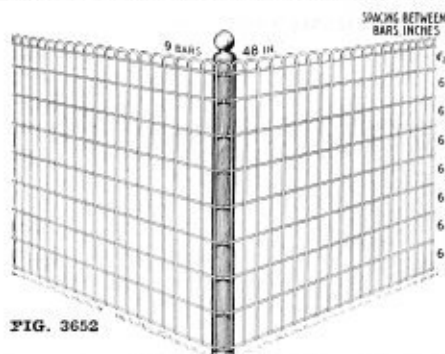


FIG. 3652

No. 9 Ornamental Lawn Fence—Stays 2 1/2 Inches Apart.

Style No.	Number of Bars	Height in Inches	Inches Between Stays	Weight Per 100 Feet	List Prices Per Lineal or Running Foot
524	5	24	2 1/2	85 lbs.	14c
630	6	30	2 1/2	103 lbs.	16c
736	7	36	2 1/2	121 lbs.	17c
842	8	42	2 1/2	138 lbs.	18c
948	9	48	2 1/2	156 lbs.	20c

"Pittsburgh Perfect" Plain Top Lawn Fences made entirely of No. 9 wire. Five heights. Picket Wires either 1 1/2 or 2 1/2 inches apart. 1 1/2 inch styles non-climbable. Perfectly protects without obstructing the view. Put up in rolls of 100 and 150 lineal or running feet. When ordering always specify what sized rolls are wanted.

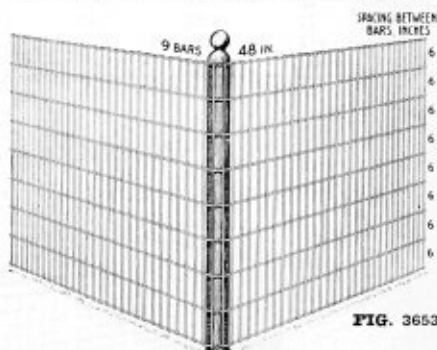


FIG. 3653

No. 9 Plain Top Lawn Fence—Stays 1 1/2 and 2 1/2 Inches Apart.

Style No.	Number of Bars	Height in Inches	Inches Between Stays	Weight Per 100 Feet	List Prices Per Lineal or Running Foot	Inches Between Stays	Weight Per 100 Feet	List Prices Per Lineal or Running Foot
524	5	24	1 1/2	106 lbs.	16c	2 1/2	80 lbs.	12c
630	6	30	1 1/2	129 lbs.	18c	2 1/2	98 lbs.	13c
736	7	36	1 1/2	153 lbs.	21c	2 1/2	115 lbs.	15c
842	8	42	1 1/2	176 lbs.	24c	2 1/2	133 lbs.	17c
948	9	48	1 1/2	200 lbs.	26c	2 1/2	150 lbs.	19c

'PITTSBURGH PERFECT' GATES

ELECTRICALLY WELDED PIPE FRAME CONSTRUCTION

Ornamental Top



FIG. 3654

Plain Top

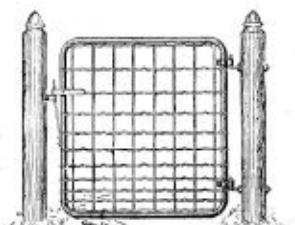


FIG. 3655

"Pittsburgh Perfect" Gates are made of steel pipe, electrically welded joints, a one-piece continuous frame of greatest strength, rigidity and durability.

For Walk Gates covered with Plain or Ornamental Top Lawn Fence, add 50 cents to net price. We cannot cover with Lawn Fence, gates over 50 inches high.

Size Ft. In.	Approx. Weight	List Prices		Size Ft. In.	Approx. Weight	List Prices	
		Plain Top	Orna- mental Top			Plain Top	Orna- mental Top
3x34	19	\$2.25	\$2.75	4x50	26	\$2.85	\$3.35
3x42	22	2.40	2.90	4x58	28	3.00	3.50
3x50	24	2.60	3.10	5x34	34	3.60	4.10
3x58	26	2.80	3.30	5x42	37	3.80	4.30
4x34	22	2.40	2.90	5x50	40	4.05	4.55
4x42	25	2.60	3.10	5x58	46	4.30	4.80

Ornamental Top

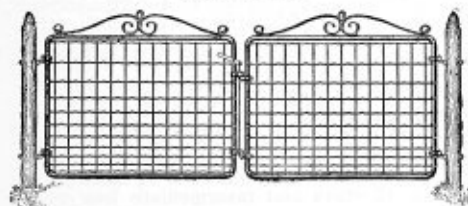


FIG. 3656

DOUBLE DRIVE Gates furnished complete with latches and hinges for wooden posts. 34-inch and 42-inch gates have single latches. 50-inch and 58-inch gates have single-action double latches (see cut). For Double Drive Gates covered with Plain or Ornamental Top Lawn Fence, add \$1.00 to net price. We cannot cover with Lawn Fence gates over 50 inches high.

When ordering specify whether Ornamental Top or Plain Top is desired. Unless otherwise ordered, Gates will be covered with No. 9 Farm Fence (all No. 9 wire), stays 6 inches apart.

Size Ft. In.	Approx. Weight	List Prices		Size Ft. In.	Approx. Weight	List Prices	
		Plain Top	Orna- mental Top			Plain Top	Orna- mental Top
10x34	77	\$7.25	\$8.75	12x34	79	\$7.70	\$9.20
10x42	80	7.75	9.25	12x42	85	8.25	9.75
10x50	85	8.25	9.75	12x50	96	8.80	10.30
10x58	88	8.80	10.30	12x58	99	9.40	10.90

"PITTSBURGH PERFECT" FARM FENCES

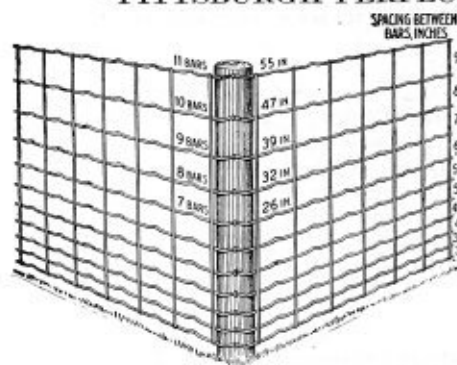
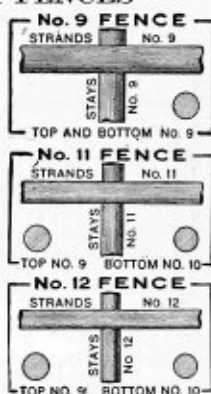


FIG. 3657

Full
Sizes
of
Wires
Used
in
"Pitts-
burgh
Perfect"
Farm
Fences



Style No.	No. of Bars	Height in Inches	Inches Between Stays	No. 9 Series		No. 11 Series		No. 12 Series	
				Approx. Weight per Rod	List Price per Rod	Approx. Weight per Rod	List Price per Rod	Approx. Weight per Rod	List Price per Rod
1155	11	55	12	15.2	.....	10.6	.....	8.5	.....
1047	10	47	12	13.6	.....	9.5	.....	7.7	.....
939	9	39	12	12.0	.....	8.4	.....	6.9	.....
832	8	32	12	10.5	.....	*7.3	.....	±5.9	.....
726	7	26	12	9.0	.....	*6.3	.....	±5.2	.....
845	8	45	12	11.5	.....	8.1	.....	6.6	.....
635	6	35	12	8.8	.....	6.3	.....	5.3	.....
1155	11	55	6	19.8	.....	13.6	.....	10.8	.....
1047	10	47	6	17.6	.....	12.1	.....	9.7	.....
939	9	39	6	15.3	.....	10.6	.....	8.6	.....
832	8	32	6	13.2	.....	*9.1	.....	±7.3	.....
726	7	26	6	11.3	.....	*7.8	.....	±6.3	.....

"Pittsburgh Perfect" Fences are made of full gage Open Hearth wire of uniformly high quality. Thoroughly and evenly coated with pure zinc galvanizing. Strong, durable, dependable. All wires ELECTRICALLY WELDED together at every crossing point. EVERY ROD GUARANTEED.

NOTE—No. 9 SERIES is made entirely of No. 9 gage wire; put up in 10 and 20 rod rolls. No. 11 SERIES has No. 9 top wire; No. 10 bottom wire, No. 11 stays and intermediate line wires; put up in 10, 20 and 40 rod rolls. No. 12 SERIES has No. 9 top wire, No. 10 bottom wire, No. 12 stays and intermediate line wires; put up in 10, 20 and 40 rod rolls.

*These styles of No. 11 SERIES have No. 10 top and bottom wires, No. 11 stays and intermediate line wires.

†These styles of No. 12 SERIES have No. 10 top and bottom wires, No. 12 stays and intermediate line wires.

IMPORTANT—When ordering, always give the Style Number of the fence desired, the Inches between Stays, and be sure to specify Series Number of Farm Fence (No. 9, No. 11 or No. 12) or the complete name of the other fences listed.

Fencing put up in the larger rolls entails less splicing during erection, and consequently is more rapidly and economically handled. Unless otherwise specified, fencing will be shipped in the largest sized rolls made. Farm Fence put up in 10 rod rolls, 25 cents extra per roll.

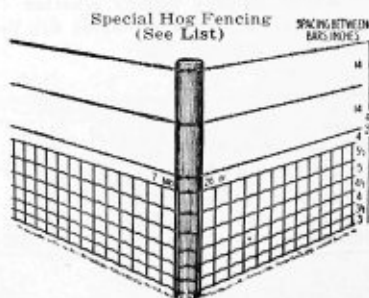
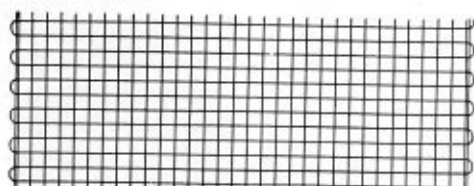


FIG. 3658

SCREEN WIRE CLOTH

DOUBLE SELVAGE, TWO WIRES ON EACH SELVAGE



12 MESH

FIG. 3659

For Window and Door Screens;
wrapped in paper and labeled.
Sold only in full rolls.

The No. 12 Mesh usually used.

Green; No. 12 Mesh; Painted; Width, in.	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
Steel Wire; No. 33 Wire, per sq. ft.	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
Black; No. 12 Mesh; Painted; Width, in.	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
Steel Wire; No. 33 Wire, per sq. ft.	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
Black; No. 14 Mesh; Painted; Width, in.	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
Steel Wire; No. 33 Wire, per sq. ft.	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
Black; No. 16 Mesh; Painted; Width, in.	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
Steel Wire; No. 33 & 34 Wire, per sq. ft.	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
Galvanized; No. 12 Mesh; Width, in.	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
No. 33 Wire, per sq. ft.	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
Galvanized; No. 14 Mesh; Width, in.	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
No. 33 Wire, per square foot.	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
Galvanized; No. 16 Mesh; Width, in.	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
Nos. 33 and 34 Wire, per square foot.	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
Galvanized; No. 18 Mesh; Width, in.	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
No. 34 Wire, per square foot.	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
Genuine Bronze Metal No. 14 Mesh;																
Width, inches	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
Combination of Nos. 31 and 32 Wires;																
No. 31 Lengthwise, No. 32 Side-																
ways, per square foot.																

Sold only in Full Rolls; 100 Lineal Feet in a Roll; Shipped loose.

WEIGHT OF WIRE CLOTH PER ROLL, ABOUT

Size Inches	18	20	22	24	26	28	30	32
Pounds	20	22	24½	26½	28½	31	33	35½
Square feet in roll	150	166⅔	183⅓	200	216⅔	233⅓	250	266⅔

Size Inches	34	36	38	40	42	44	46	48
Pounds	38	40	42	44	46½	48½	51	53
Square feet in roll	283⅓	300	316⅔	333⅓	350	366⅔	383⅓	400

WIRE CLOTH

3 x 3 MESH, No. 11 WIRE



FIG. 3660

4 x 4 MESH, No. 12

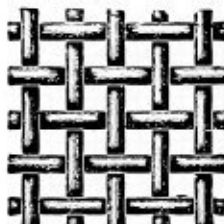


FIG. 3661

6 x 6 MESH, No. 14

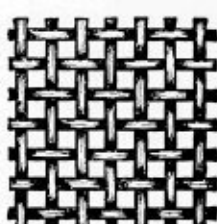


FIG. 3662

8 x 8 MESH, No. 16

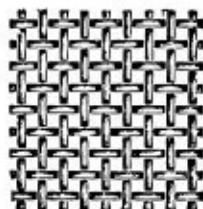


FIG. 3663

10 x 10 MESH, No. 18

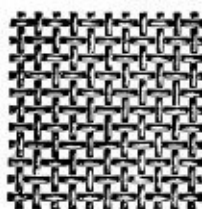


FIG. 3664

12 x 12 MESH, No. 20

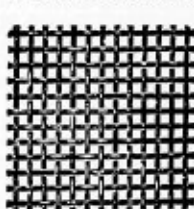


FIG. 3665

14 x 14 MESH, No. 21

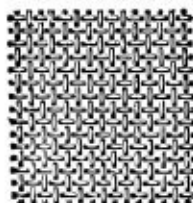


FIG. 3666

16 x 16 MESH, No. 22

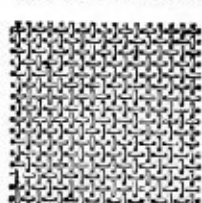


FIG. 3667

18 x 18 MESH

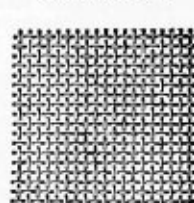


FIG. 3668

30 x 30 MESH

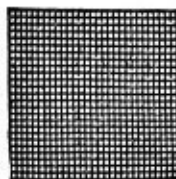


FIG. 3669

35 x 35 MESH

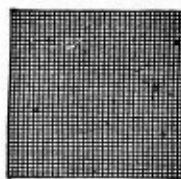


FIG. 3670

40 x 40 MESH

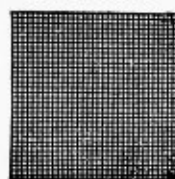


FIG. 3671

IRON OR STEEL DOUBLE CRIMPED WIRE CLOTH

The mesh in wire cloth is the distance from center to center of wire, all rolls 100 feet.

1	No. of Meshes per Inch	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	" " Wire	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	Price per Square Foot	\$0.88	.73	.60	.50	.44	.38	.32	.28	.24	.20	.17	.14	.12	.10	.09
3/4	No. of Meshes per Inch	3 1/4	3 1/2	3 3/4	4	4 1/4	4 1/2	4 3/4	5	5 1/4	5 1/2	5 3/4	6	6 1/4	6 1/2	6 3/4
	" " Wire	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Price per Square Foot	\$0.88	.73	.60	.50	.42	.38	.32	.27	.22	.19	.16	.14	.11	.09	.08
5/8	No. of Meshes per Inch	5 5/8	5 1/2	5 1/4	5	4 3/4	4 1/2	4 1/4	4	3 3/4	3 1/2	3 1/4	3 1/8	3 1/16	2 3/4	2 3/8
	" " Wire	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	Price per Square Foot	\$0.88	.73	.60	.50	.42	.35	.30	.25	.22	.18	.15	.13	.11	.09	.08
2	No. of Meshes per Inch	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	" " Wire	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Price per Square Foot	\$0.88	.75	.60	.50	.42	.35	.30	.25	.20	.17	.14	.12	.10	.09	.08
2 1/2	No. of Meshes per Inch	2 1/2	2 1/4	2 1/8	2 1/16	2 1/32	2 1/64	2 1/128	2 1/256	2 1/512	2 1/1024	2 1/2048	2 1/4096	2 1/8192	2 1/16384	2 1/32768
	" " Wire	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
	Price per Square Foot	\$0.72	.60	.50	.42	.35	.30	.25	.20	.17	.14	.12	.10	.09	.08	.07
3	No. of Meshes per Inch	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	" " Wire	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	Price per Square Foot	\$0.75	.60	.50	.40	.35	.30	.25	.20	.17	.14	.12	.10	.09	.08	.07
3 1/2	No. of Meshes per Inch	3 1/2	3 1/4	3 1/8	3 1/16	3 1/32	3 1/64	3 1/128	3 1/256	3 1/512	3 1/1024	3 1/2048	3 1/4096	3 1/8192	3 1/16384	3 1/32768
	" " Wire	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	Price per Square Foot	\$0.75	.65	.50	.40	.35	.30	.25	.20	.15	.13	.11	.10	.09	.08	.07
4	No. of Meshes per Inch	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	" " Wire	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	Price per Square Foot	\$0.80	.60	.48	.38	.32	.27	.22	.17	.14	.12	.11	.10	.09	.08	.07
4 1/2	No. of Meshes per Inch	4 1/2	4 1/4	4 1/8	4 1/16	4 1/32	4 1/64	4 1/128	4 1/256	4 1/512	4 1/1024	4 1/2048	4 1/4096	4 1/8192	4 1/16384	4 1/32768
	" " Wire	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
	Price per Square Foot	\$0.73	.55	.42	.35	.30	.25	.20	.17	.14	.12	.11	.10	.09	.08	.07
5	No. of Meshes per Inch	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	" " Wire	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
	Price per Square Foot	\$0.60	.48	.40	.35	.30	.25	.20	.17	.14	.12	.10	.09	.08	.07	.06
6	No. of Meshes per Inch	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	" " Wire	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
	Price per Square Foot	\$0.60	.48	.40	.35	.30	.25	.20	.17	.14	.12	.10	.09	.08	.07	.06
7	No. of Meshes per Inch	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	" " Wire	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
	Price per Square Foot	\$0.60	.48	.40	.35	.30	.25	.22	.17	.14	.12	.10	.09	.08	.07	.06
8	No. of Meshes per Inch	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	" " Wire	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	Price per Square Foot	\$0.60	.48	.42	.35	.30	.25	.22	.17	.14	.12	.10	.09	.08	.07	.06
9	No. of Meshes per Inch	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
	" " Wire	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	Price per Square Foot	\$0.60	.48	.42	.35	.32	.25	.22	.17	.14	.12	.10	.09	.08	.07	.06
10	No. of Meshes per Inch	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	" " Wire	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
	Price per Square Foot	\$0.60	.48	.40	.35	.30	.25	.20	.15	.12	.11	.10	.09	.08	.07	.06
12	No. of Meshes per Inch	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
	" " Wire	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
	Price per Square Foot	\$0.72	.60	.48	.45	.38	.30	.22	.17	.15	.13	.11	.10	.09	.08	.07

Prices on finer meshes upon application.

BOX STRAPPING

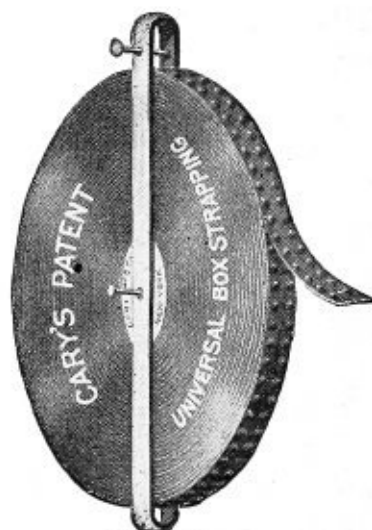


FIG. 3672

A continuous metal strap with a series of raised bosses along the edges to strengthen same and protect nailheads. Put up in coils of 300 feet each, and packed 20 coils in a case. On each coil we put our patent metal reel frame, ready to hang up.

No. 0.	$\frac{1}{2}$ inch wide, 300 feet on reel..	\$1.00
No. 1.	$\frac{5}{8}$ inch wide, 300 feet on reel..	1.25
No. 2.	$\frac{3}{4}$ inch wide, 300 feet on reel..	1.50
No. 3.	1 inch wide, 300 feet on reel..	2.00
No. 3.	1 inch wide, 300 feet on reel, extra heavy	2.50

CORRUGATED JOINT BOX FASTENERS

Saw Edge



FIG. 3673

Plain Edge



FIG. 3674

Divergent and Parallel Corrugations.

Put up in paper cartons of 500 and 1,000. Also packed in bulk in cases, kegs, and barrels.

LIST PRICES PER THOUSAND

Number of Corrugations	Inches in Depth						
	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
No. 3	\$0.60	\$0.75	\$0.85	\$1.00	\$1.15	\$1.35	\$1.45
No. 4	.75	.95	1.05	1.30	1.45	1.75	1.85
No. 5	.90	1.20	1.30	1.70	1.85	2.20	2.40
No. 6	1.10	1.40	1.50	1.85	2.15	2.55	2.85
No. 7	1.30	1.60	1.80	2.20	2.50	3.00	3.35
No. 8	1.50	1.80	2.10	2.55	2.90	3.45	3.85

When ordering give depth and number, as $\frac{1}{4}$ -inch. No. 3; $\frac{1}{2}$ -inch. No. 4, etc.

STENCIL CUTTING MACHINE AND BRUSH

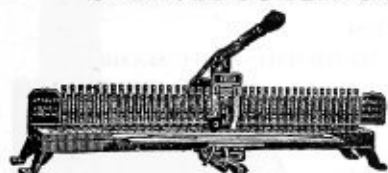


FIG. 3675



FIG. 3676

STENCIL CUTTING MACHINE

Cut letters, $\frac{3}{4}$ inch high. Use oiled paper only.....Price each \$....

STENCIL BRUSH

No. 8—Medium size\$0.50 No. 10—Medium size.....\$0.60

STENCIL PAPER

Heavy oiled paper for above machine.....Per 100 \$....



FIG. 3677

BRADLEY
BALL MARKING AND
STENCIL POT

Price, Tin\$0.70

Price, Copper 2.00

STENCIL AND MARKING INKS

JET BLACK, combination Stencil and Marking Pot Ink. Does not freeze,
fade or smudge. Cannot rub off.....Per gallon \$3.00
Red, Blue, White, Yellow or Green.....Per gallon \$.00

PASTE STENCIL INKS

Soluble in Kerosene or Turpentine

Black, in 1 lb. cans.....Per pound \$0.60
Red, White, green, yellow or blue.....Per pound 1.50

NAIL PULLER



FIG. 3678

Length, 18 inches. Weight, $4\frac{1}{2}$ pounds each.....Per dozen \$18.00

HAND MADE STEEL STAMPS ALPHABETS AND FIGURES

WE FULLY WARRANT THEM TO BE THE BEST MADE

Size	Style	Figures per set	Alphabet per set	Steel Stamps per letter
1-32	TAPPED	\$2.50	\$7.50	30c.
1-24	TAPPED	2.00	6.00	30c.
1-20	TAPPED	1.75	5.25	25c.
1-16	TAPPED	1.50	4.50	25c.
1-12	TAPPED	1.50	4.50	25c.
3-32	TAPPED	1.50	4.50	25c.
1-10	TAPPED	1.50	4.50	25c.
1-8	TAPPED	1.50	4.50	25c.
5-32	TAPPE	1.75	5.25	25c.
3-16	TAPE	2.00	6.00	25c.
7-32	TAP	2.25	6.75	25c.
1-4	TA	2.50	7.50	30c.
5-16	TA	3.00	9.00	35c.
3-8	TA	3.50	10.50	50c.
7-16	TA	4.50	13.50	55c.
1-2	TAP	5.00	15.00	60c.



FIG. 3681

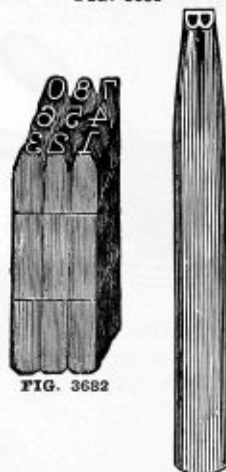


FIG. 3682

FIG. 3683

If you use this grade of Steel Letters and Stamps you will never want any other.

We not only carry the largest stock and make the best letters, both in white metal and brass, but we can fill orders more promptly than any competitor.

Always mention for what purpose the stamps are to be used. Hammer stamps with hole for handle, 50 cents per lb. extra for steel forging; 30 cents per lb. additional for forging on all steel stamps with letters larger than $\frac{5}{16}$ inch; 25 per cent additional to these prices on stamps of two or more lines, or stamps cut on curve; 25 to 50 per cent additional on stamps for stamping silverware or cutlery.

CAST-IRON LETTERS AND FIGURES

FOR STAMPING WOOD, LEATHER,
SOFT METALS, ETC.

For many purposes are fully equal to steel and are much cheaper.

They are cut very sharp and deep, are finely finished and adapted for marking wood patterns, leather goods and soft metals. Can be used for burning brands. Two sizes $\frac{1}{2}$ and $\frac{3}{4}$ inches.

Full set $\frac{1}{2}$ inch	Figures.....	\$2.00
" " $\frac{1}{2}$ "	Alphabet.....	6.00
" " $\frac{3}{4}$ "	Figures.....	3.50
" " $\frac{3}{4}$ "	Alphabet.....	10.00



FIG. 3684

Impression of $\frac{1}{2}$ inch

E 2

PATENT MOVABLE COPPER LETTER BURNING BRANDS

$\frac{3}{4}$ inch Name Burning Brands, including 9 letters..... \$1.00

$\frac{1}{2}$ inch Name Burning Brands, including 9 letters..... 1.50

Extra $\frac{1}{4}$ inch letters, 5 cents each. Extra $\frac{1}{2}$ inch letters, 8 cents each.

Solid Cast-Iron or Copper Burning Brands to order, at reasonable prices.



FIG. 3685

Impression of $\frac{3}{4}$ inch

E 2

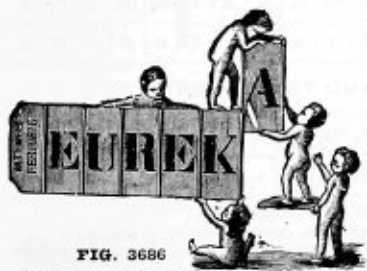


FIG. 3686

Single Letters and Figures extra.

$\frac{1}{2}$ inch, 2 $\frac{1}{2}$ c; $\frac{3}{4}$ inch, 3c; 1 inch, 4c.
 $1\frac{1}{2}$ inch, 5c; 2 inch, 6c; 2 $\frac{1}{2}$ inch, 8c.

STENCILS

$\frac{1}{2}$ inch	Alphabet 27 letters.....	\$0.85
$\frac{3}{4}$ "	" " 27 ".....	.90
1 "	" " 27 ".....	1.05
$1\frac{1}{2}$ "	" " 27 ".....	1.30
2 "	" " 27 ".....	1.80
$2\frac{1}{2}$ "	" " 27 ".....	2.60
$\frac{1}{2}$ "	Figures 15 Pieces.....	.35
$\frac{3}{4}$ "	" " 15 ".....	.40
1 "	" " 15 ".....	.45
$1\frac{1}{2}$ "	" " 15 ".....	.60
2 "	" " 15 ".....	.85
$2\frac{1}{2}$ "	" " 15 ".....	1.25

WHITE METAL PATTERN LETTERS AND FIGURES

FOR FOUNDRYMEN, MACHINISTS AND PATTERN MAKERS

ROMAN STYLE, STANDARD THICKNESS



FIG. 3687

Size.....in.	$\frac{1}{8}$	$\frac{9}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{2}$	3
Price,cts.ea.	2	2	2	2	$2\frac{1}{2}$	3	3	4	4	5	6	7	10	15	20	30	40	50

SHARP GOTHIC

MORE GENERALLY USED THAN ANY OTHER LETTER MADE



FIG. 3688

Size .....,in.	$\frac{9}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	
Price.....cts.ea.	3	2	2	2	$2\frac{1}{2}$	3	3	4	4	5	6	7	10	15	30	40	50

FLAT FACE GOTHIC—THIN LETTERS



FIG. 3689

Size.....in.	$\frac{1}{8}$	$\frac{9}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{2}$	3
Price.....cts. ea.	2	2	2	2	$2\frac{1}{2}$	3	3	4	4	6	7	10	15	20	30	40	50

ROUND FACE GOTHIC—STANDARD THICKNESS



FIG. 3690

Size.....in.	$\frac{9}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price.....cts. ea.	2	2	2	$2\frac{1}{2}$	3	4	5	6	7	10	15	30	40	50		

FANCY POINTED, OR ANTIQUE



FIG. 3691

Size.....in.	$\frac{9}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price.....cts.ea.	$2\frac{1}{2}$	3	4	5	6	7	10	15	30	40	50	75	100	150	200	300

HAIR LINE GOTHIC

FOR HOLLOW WARE, STOVE MANUFACTURERS, ETC.



FIG. 3692

Size.....in.	$\frac{9}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	
Price.....cts. ea.	3	2	2	2	2½	3	3	4	4	5	6	7	10	15	30

FLATTENED FACE SHARP GOTHIC NO. 1



FIG. 3693

Size.....in.	$\frac{9}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price.....cts.ea.	2	2	2	$2\frac{1}{2}$	3	3	4	4	5	6	7	10	15	30	40	50

DORIC—STANDARD THICKNESS



FIG. 3694

Size	in.	$\frac{9}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3
Price	cts. ea.	2	2	2	2 $\frac{1}{2}$	3	4	4	5	7	10	15	30	40	50	

REVERSED SHARP GOTHIC

FOR STAMPING IN ARTIFICIAL STONE, CONCRETE WALKS, ETC.

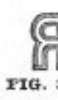


FIG. 3695

Size.....in.	$\frac{1}{4}$	$\frac{9}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	3
Price.....cts.ea.	2	2	$2\frac{1}{2}$	3	3	4	4	5	6	7	10	15	30	50

We can furnish all other styles and sizes of Reversible letters and figures.

MOLDERS' TOOLS

SQUARE TROWELS



FIG. 3696

Length, inches	4½	5	5½	6	6½	7
1 in., each	\$0.50	.55	.60	.65		
1½ in., each		.55	.60	.65	.70	
1½ in., each		.65	.70	.75	.80	.85
1½ in., each		.80	.85	.90	.95	1.05
2 in., each		.90	.95	1.00	1.05	1.15

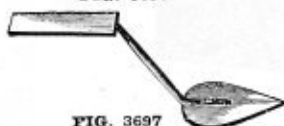


FIG. 3697

HEART AND SQUARE

Width, inches	¾	1	1¼	1½	1¾	2
Price, each	\$.045	.50	.60	.70	.80	.90



FIG. 3698

SLICK AND OVAL SPOON

Width, inches	¾	1	1¼	1½	1¾	2
Price, each	\$.045	.50	.60	.70	.80	.90



FIG. 3699

HEART AND SQUARE SPOON

Width, inches	1	1¼	1½
Price, each	\$.50	.60	.70



FIG. 3700

HEART AND LEAF

Width, inches	1	1¼	1½
Price, each	\$.50	.60	.70



FIG. 3701

OVAL STOVE

Width, inches	5/8
Price, each	\$.040



FIG. 3702

NO. 1 BENCH LIFTER

Width, inches	¼	¾	1½	5/8	¾
Price, each	\$.035	.45	.50	.55	.60

LIFTER



FIG. 3703

Size, inches	10	12	14	16	18	20
¾ in. price, each	\$0.40	.45	.50	.55		
¾ in. price, each		.45	.50	.55	.60	
¾ in. price, each		.50	.55	.60	.65	
¾ in. price, each		.55	.60	.65	.70	.75
¾ in. price, each		.65	.70	.75	.80	
¾ in. price, each		.70	.75	.80	.85	.90
1 in. price, each			.85	.90	.95	\$1.00



FIG. 3704

SQUARE CORNER SLICK

Width, inches	2	2½	3
Price, each	\$.60	.65	.70

DIAMOND SNAP FLASKS



FIG. 3705

These flasks are adaptable to either molding machines or squeezers and are constructed to withstand severe strains. They are quickly and easily operated and are specially adapted to foundries doing repetition work.

The accurate construction of the flasks eliminates all molding troubles, assuring greater production and less castings in the scrap pile.

Diamond Master Flask

Straight side, two-part, any size and depth, list price.....	\$24.00
Taper side, two-part, any size and depth, list price.....	26.00

Diamond Standard Flask

Straight side, two-part, any size and depth, list price.....	16.00
Taper side, two-part, any size and depth, list price.....	18.00

Diamond Round Flask, any size and depth..... 25.00

Special shapes and cuts. Prices on application.

Bracing, extra 1.00

DIAMOND STANDARD FLASK CLAMP



FIG. 3706

HEADS

Number Head	For Bar Iron Tail	List, Per Dozen
1	$\frac{5}{8}$ x $\frac{5}{8}$	\$4.80
2	$\frac{3}{4}$ x $\frac{3}{4}$	6.00
3	$\frac{7}{8}$ x $\frac{7}{8}$	7.20
4	1 x 1	8.40

CLAMPS COMPLETE

No. Clamp	No. Head	Adjustment, Inches	List Per Doz.	No. Clamp	No. Head	Adjustment, Inches	List Per Doz.
6	1	from 10 to 14	\$12.00	12	2	from 22 to 27	\$14.00
7	1	from 14 to 18	12.00	13	3	from 8 to 14	16.00
8	1	from 18 to 22	12.00	14	3	from 14 to 20	16.00
9	2	from 7 to 12	14.00	15	3	from 20 to 26	16.00
10	2	from 12 to 17	14.00	16	3	from 26 to 32	16.00
11	2	from 17 to 22	14.00				

"FIT-WELL" BRASS DOWELS

A complete line of brass dowels, grooved and smooth sides in the popular sizes.

Our "Fit-Well Dowels" embody every good point and contain no bad features. To properly dowel any pattern, both halves should be drilled at the same time and with the same bit. Remember that a peg and tube dowel or any dowel without a shoulder requires two bits, which means twice as much time to fit and there is only one chance out of ten that you center it properly.

"Fit-Well Dowels" can not come other than in absolutely correct register as the hole in both halves of the pattern should be continuous. The hole for the tube part of the dowel should be drilled clear through the pattern but in the other half only far enough to admit the dowel.

Beware of any dowel in which the tube part is not open all the way through—as soon as the sand fills this up you will lose a mold. "Fit-Well Dowels" are open clear through and the sand will automatically free itself.

Dowels which screw in and out are sure to become loose by vibration in rapping the pattern. A loose dowel very often means the loss of a mold or casting. Our "Fit-Well Dowels" can not come loose and their outside dimensions are such that they can be fitted with standard size bits.

They are also interchangeable.

LIST ADOPTED FEBRUARY 25, 1900
GROOVED OR SMOOTH



FIG. 3707

No.	Outside Dimension	Diameter of Pin, Inches	Price Per 100
1	$\frac{5}{8} \times \frac{3}{16}$	$\frac{1}{8}$	\$2.50
2	$\frac{3}{4} \times \frac{1}{4}$	$\frac{3}{16}$	3.50
2½	$\frac{7}{8} \times \frac{3}{16}$	$\frac{7}{32}$	4.50
3	1 x $\frac{3}{8}$	$\frac{9}{32}$	5.50
4	1¼ x ½	11/32	8.50
5	1½ x 5/8	½	12.00



FIG. 3708

"FIT-WELL" BRASS PLATE DOWELS—ROUND

NO MORTISING REQUIRED—USE A BIT



FIG. 3709

No.	Diameter of Plate, Inches	Pin, Inches	Price Per 100
1	$\frac{3}{4}$	$\frac{1}{4}$	\$3.00
2	1	$\frac{5}{16}$	4.50
3	1¼	$\frac{3}{8}$	6.50
4	1½	$\frac{7}{16}$	9.00
5	2	½	15.00

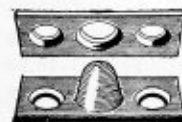
"FIT-WELL" BRASS PLATE DOWELS—OBLONG

FIG. 3710

No.	Length, Inches	Diameter of Pin, Inches	Price Per 100
1	$\frac{3}{4}$	$\frac{1}{4}$	\$3.00
2	1	$\frac{5}{16}$	4.50
3	1¼	$\frac{3}{8}$	6.50
4	1½	$\frac{7}{16}$	9.00
5	2	½	13.00
6	2½	$\frac{9}{16}$	17.00

CHAPLETS—SINGLE HEAD, FORGED



FIG. 3711

Square plates fitted are always furnished unless otherwise specified and we believe they are preferred in the majority of instances. We are also prepared to furnish chaplets of any size with plates curved to fit the diameter of the core.

LIST PRICE, PER HUNDRED

Diameter of plates, in.	$\frac{3}{4}$ and 1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{2}$	3
Thickness of plates, in.	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{7}{16}$	$\frac{1}{2}$	$1\frac{1}{16}$	$\frac{3}{16}$	$\frac{1}{4}$
Diameter of stem, in.	$\frac{1}{8}$ and $\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
Length 3 inches	\$3.40	\$4.00	\$5.00	\$6.30	\$8.00	\$12.00	\$20.00
Length 4 inches	3.50	4.20	5.40	6.80	9.00	13.50	22.00
Length 5 inches	3.60	4.40	5.80	7.30	10.00	15.00	24.00
Length 6 inches	3.70	4.60	6.20	7.80	11.00	16.50	26.00
Length 7 inches	3.80	4.80	6.60	8.30	12.00	18.00	28.00
Length 8 inches	3.90	5.00	7.00	8.80	13.00	19.50	30.00
Length 9 inches	4.00	5.20	7.40	9.30	14.00	21.00	32.00
Length 10 inches	4.10	5.40	7.80	9.80	15.00	22.50	34.00
Length 11 inches	4.20	5.60	8.20	10.30	16.00	24.00	36.00
Length 12 inches	4.30	5.80	8.60	10.80	17.00	25.50	38.00
Net price for curving plates to suit diameter of core...	.35	.35	.50	.60	.75	.90	1.25

CHAPLETS—SINGLE HEADS, FORGED

The standard type of this chaplet, is carefully made. The head for same is forged in such a manner as to make it absolutely uniform in thickness and perfectly round and perfectly centered over the stem.

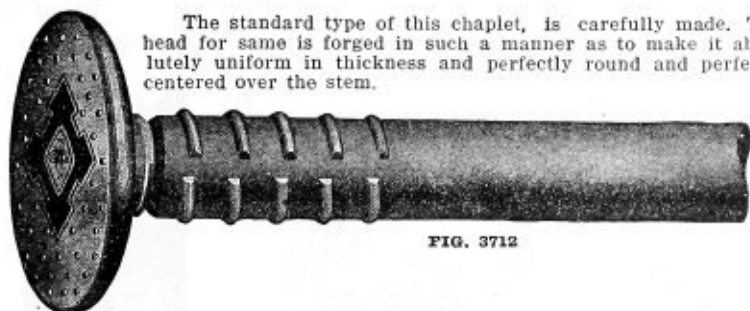


FIG. 3712

CHAPLET STEMS

We likewise are in position to supply Chaplet Stems to which foundrymen can fit any size plate desired at the same list as shown for single head forged Chaplets below.



FIG. 3713

PRICE LIST EFFECTIVE JAN. 25, 1910

WROUGHT IRON CHAPLETS WITH FORGED HEADS AND WROUGHT IRON CHAPLET STEMS

Length, Inches	Diameter of Stem, Inches						
	$\frac{1}{8}$ and $\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
3	\$2.40	\$3.00	\$3.70	\$4.30	\$6.00	\$8.00	\$11.00
4	2.50	3.20	4.10	4.80	6.90	9.40	13.00
5	2.60	3.40	4.50	5.30	7.80	10.80	15.00
6	2.70	3.60	4.90	5.80	8.70	12.20	17.00
7	2.80	3.80	5.30	6.30	9.60	13.60	19.00
8	2.90	4.00	5.70	6.80	10.50	15.00	21.00
9	3.00	4.20	6.10	7.30	11.40	16.40	23.00
10	3.10	4.40	6.50	7.80	12.30	17.80	25.00
11	3.20	4.60	6.90	8.30	13.20	19.20	27.00
12	3.30	4.80	7.30	8.80	14.10	20.60	29.00
Net price for pointing ..	.40	.40	.60	.75	1.00	1.25	1.50

To obtain the price on lengths over 12 inches, add to the list price of the 12-inch length, the difference between the 11-inch and 12-inch lengths for each additional inch in length.

DOUBLE HEAD CHAPLETS



FIG. 3714

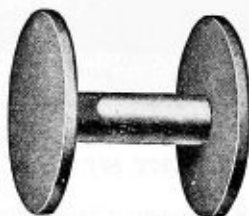


FIG. 3715

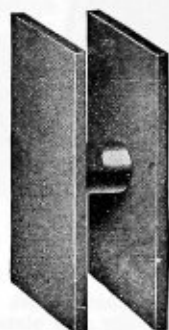


FIG. 3716

SQUARE OR ROUND PLATES FITTED

PLAIN OR TINNED

Square plates always furnished unless otherwise specified.

LIST PRICE PER HUNDRED

Length, inches	Diameter of Stem						
	No. 8 Ga & 10	1/4	5/16 & 3/8	1/2	3/8	3/4	7/8
1/4 to 1/2	\$4.00	\$6.00	\$8.00	.....	.....	.....	.....
5/8 to 1	4.50	6.00	8.00	\$10.00	\$12.00	\$14.00	\$17.00
1 1/4 to 1 1/2	5.00	6.50	9.00	12.00	14.00	16.00	19.00
1 5/8 to 2	5.50	7.00	10.00	14.00	16.00	18.00	21.00
2 1/8 to 2 1/2	6.00	7.50	11.00	16.00	18.00	20.00	23.00
2 5/8 to 3	6.50	8.00	12.00	18.00	20.00	22.00	25.00
3 1/8 to 3 1/2	.....	.....	.....	20.00	22.00	24.00	27.00
3 5/8 to 4	.....	.....	.....	22.00	24.00	26.00	29.00
4 1/8 to 4 1/2	.....	.....	.....	24.00	26.00	28.00	31.00
4 5/8 to 5	.....	.....	.....	26.00	28.00	30.00	33.00

Special size Chaplets made to order.

LEATHER FILLET

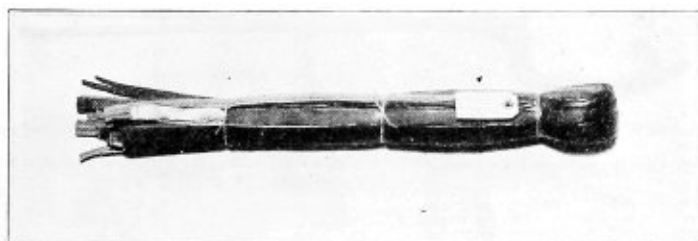


FIG. 3717

Leather Fillet is commonly recognized by the best pattern-makers as being indispensable on the majority of pattern work.

It costs one-half less than filleting by any other method, time considered. It makes the best job, is not affected by moisture, will not shrink out of place and is easily adjustable to any shape or angle.

No.	1	2	3	4	5	6	8	10	12	14	16
Size or radius.....	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
Width of flat face.....	$\frac{3}{32}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{5}{8}$
Weight per 100 ft., ounces	2	3	7	9	15	20	32	48	68	74	80
Price per 100 feet.....	\$2.00	2.00	3.00	4.00	5.00	6.00	8.00	10.00	12.00	14.00	16.00

WOOD FILLET

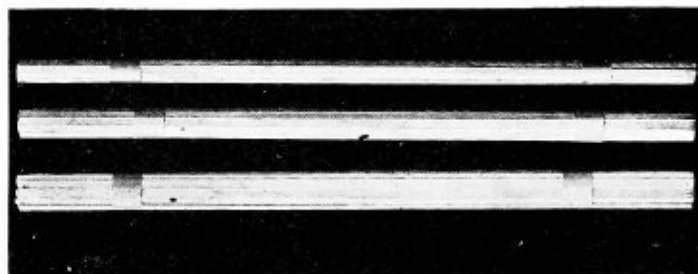


FIG. 3718

Size, inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2
Price, per 100 feet.....	\$2.00	2.50	3.00	3.50	4.00	4.50	5.00	7.00	9.00	12.00	15.00

CRUCIBLE TONGS

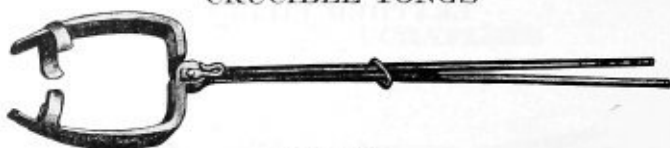


FIG. 3719

We can furnish these tongs either with eye or hook placed at hinge or at any desired point on the handle.

To hold Crucibles, from No.	1 to 10	list price, per pair	\$11.00
" " " "	12 " 20	" " " "	13.75
" " " "	25 " 50	" " " "	16.50
" " " "	60 " 100	" " " "	21.00
" " " "	125 " 150	" " " "	27.50
" " " "	200 " 300	" " " "	38.50

DOUBLE CARRYING SHANKS



FIG. 3720

These Shanks are made exceptionally strong. There are no welds where the handle joins the ring, nor in the ring. All metal between the center of one handle and the center of the other is forged from a single piece without welding.

To hold Crucibles, from No.	25 to 50	list price, each	\$11.00
" " " "	60 " 100	" " " "	13.75

SINGLE CARRYING SHANKS



FIG. 3721

To hold Crucibles, from No.	1 to 10	list price, each	\$4.35
" " " "	12 " 20	" " " "	5.50

SEAMLESS STEEL MELTING LADLES

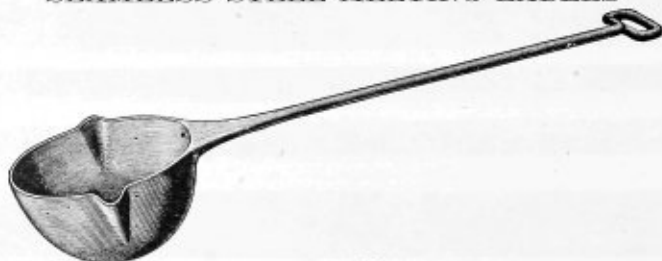


FIG. 3722

Diameter of Bowl...inches	2½	3	4	5	6	7	8	9	10	11	12	14
Length of Handle...inches	17½	17½	19½	23	29	30	33	35	40	40	44	44
List price.....each	\$1.00	1.15	1.30	1.45	1.75	2.05	2.65	3.25	3.85	4.45	5.05	5.65



FIG. 3723

PLUMBAGO CRUCIBLES

Adapted for every purpose
for general and special re-
quirements of metal melting.

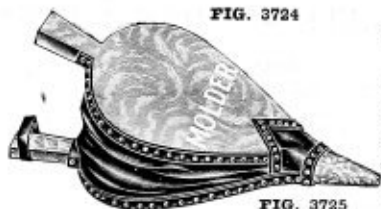
STANDARD SIZES

No.	Height Outside Inches	Diameter at Top Outside Inches	Diameter at Bilge Outside Inches	Diameter at Bottom Outside Inches	Holding Capacity Liquid Measure Pints
0	2	1 1/2	1 1/2	1 1/2	0
00	2 1/4	1 1/2	1 1/2	1 1/2	0
000	2 1/2	1 1/2	1 1/2	1 1/2	0
0000	2 3/4	1 1/2	1 1/2	1 1/2	0 1/4
1	3	2 1/4	2 1/4	2 1/4	0 1/2
1 1/2	3 1/4	2 1/4	2 1/4	2 1/4	0 3/4
2	4 1/2	3 1/4	3 1/4	3 1/4	1
3	5 1/4	4 1/4	4 1/4	4 1/4	1 1/2
4	5 5/8	4 5/8	4 5/8	4 5/8	1 3/4
5	6	4 7/8	4 7/8	4 7/8	2 1/4
6	6 1/2	5 1/2	5 1/2	5 1/2	2 1/2
7	6 3/4	5 1/2	5 1/2	5 1/2	3
8	7 1/8	5 3/4	5 3/4	5 3/4	3 1/2
9	7 5/8	5 3/4	5 3/4	5 3/4	4 1/2
10	8	6 1/8	6 1/8	6 1/8	4 1/2
12	8 1/4	6 3/4	6 3/4	6 3/4	5 5/8
14	8 5/8	7	7 1/4	7 1/4	6 1/2
16	9 1/2	7 1/2	7 1/2	7 1/2	6 3/4
18	10	7 3/4	8	8	9 1/5
20	10 3/8	7 3/4	8 1/2	8 1/2	10 5/8
25	11	8 1/4	9	9	11 5/8
30	11 1/2	8 3/4	9 3/8	9 3/8	14 1/2
35	12 1/4	9 3/8	10	10	16 3/8
40	12 3/4	9 5/8	10 1/4	10 1/4	19 1/4
45	13 1/4	10	10 3/8	10 3/8	23
50	13 1/2	10 1/4	11 1/2	11 1/2	24 1/2
60	14 1/8	10 1/2	11 1/2	11 1/2	26
70	14 3/8	10 3/4	12	12	30 1/2
80	15 1/2	11 1/2	12 1/2	12 1/2	36 1/2
90	16	11 3/4	12 3/4	12 3/4	38 1/2
100	16 1/4	12 1/4	13 1/4	13 1/4	43 3/4
125	16 3/4	12 3/4	14	14	55 1/4
150	16 5/8	12 3/4	14 3/8	14 3/8	69 3/4
175	19 3/4	14 3/8	16	16	80 3/4
200	20 3/8	15	16 3/4	16 3/4	96 1/4
225	20 3/8	15	16 3/4	16 3/4	104 3/8
250	21	15 1/2	17 1/4	17 1/4	129 3/4
275	22 1/2	16 1/4	17 3/4	17 3/4	
300	22 3/4	16 1/4	17 3/4	17 3/4	
400	24 1/2	17 1/2	19 1/2	19 1/2	

**HAND BELLOWS NO. 102**

For removing dust from pianos, typewriters, furniture, etc.

Size, in.	6	7	8	9	10	11	12
Per doz.	12.00	14.00	16.00	18.00	20.00	22.00	26.00

FIG. 3724**MOLDERS' BELLOWS NO. 100**

These bellows are built for heavy work and are especially adapted for use in foundries and machine shops and should be used in every factory for removing dust from dynamos, motors and other machinery.

Size, in.	8	9	10	11	12	14	16
Per doz.	16.00	18.00	20.00	22.00	26.00	32.00	36.00

FIG. 3725**BENCH RAMMERS****FIG. 3726**

List per pair

- No. 199. Well Seasoned Hard Wood, Oil Finished, Butts $3\frac{3}{8}$ in. diameter....\$1.00
 No. 200. Well Seasoned Hard Wood, Oil Finished, Butts $4\frac{1}{2}$ in. diameter.... 1.25

When ordering Bench Rammers, be particular to state the number or size desired. No. 199 is the size generally used.

FLOOR RAMMERS**FIG. 3727**

List per dozen

- No. 205. Floor Rammer complete, Hickory Handle, Iron Butt and Pean.
 Length over-all 48 in.\$28.50
 No. 206. Floor Rammer complete, Hickory Handle, Iron Butt, Rubber Tipped
 Pean. Length over-all 48 in. 42.00
 No. 208. Floor Rammer complete, Iron Handle, Iron Butt and Pean. Length
 over-all 54 in. 36.00

LUMP CHARCOAL

Price, per 100 lbs.\$.....

FOUNDRY RIDDLES

Foundry



FIG. 3728

Scrap Iron



FIG. 3729

		Per doz.
Foundry—Standard Grade Steel.....	Nos. 2 to 16 Mesh, Diam. 18 x 4 3/4 in.	\$13.00
Foundry—Extra Heavy Grade Steel.....	Nos. 2 to 16 Mesh, Diam. 18 x 4 3/4 in.	15.00
Foundry—Standard Grade Galvanized.....	Nos. 2 to 10 Mesh, Diam. 18 x 4 3/4 in.	16.00
Foundry—Extra Heavy Grade Galvanized.....	Nos. 2 to 10 Mesh, Diam. 18 x 4 3/4 in.	18.00
Foundry—Standard Grade Brass.....	Nos. 2 to 16 Mesh, Diam. 18 x 4 3/4 in.	32.00
Foundry—Extra Heavy Grade Brass.....	Nos. 2 to 16 Mesh, Diam. 18 x 4 3/4 in.	36.00
Scrap Iron, for small castings, etc., Steel, Nos. 2 to 16 Mesh, Diam. 18 x 4 3/4 in.		24.00

In ordering, specify Mesh required.

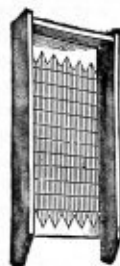


FIG. 3730

SAND SCREENS

NO. 4—STEEL WIRE

The new process of lacing or wrapping these screens makes them the strongest and most durable screens made of this kind.

Regular, 5 1/2 feet by 24 inches.....each, \$10.00

Large, 6 feet by 26 1/2 inches.....each, 11.00

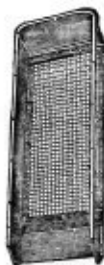


FIG. 3731

COAL SCREENS

NO. 7—CRIMPED WIRE

Made with heavy hardwood frame and extra heavy crimped wire.

5 feet by 30 inches.....each, \$18.00

6 feet by 36 inches.....each, 22.00

REVOLVING SAND AND COAL SCREENS

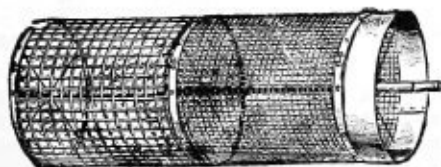


FIG. 3732

These revolving screens are used in various coal mines throughout the country for separating pea coal from dust. Are made from very heavy steel wire cloth bolted to a heavy iron frame. The coarse part is generally 5/8 to 1-inch and the fine part 3/8 to 1/2-inch.

Are also made for gas works and coke companies for screening coke, etc.

PLAIN STEEL WIRE CASTING BRUSHES



FIG. 3733

Made of first quality fine tempered steel wire on well finished solid hardwood blocks, strong and durable, and will withstand the severe use.

			List Per Gross
No. 1	4x10 rows, length of wire 2 in., block $7\frac{3}{4} \times 2\frac{1}{4}$ in.	List per gross...	\$40.00
No. 2	4x10 rows, length of wire 3 in., block $7\frac{3}{4} \times 2\frac{1}{4}$ in.	List per gross...	46.00
No. 3	4x10 rows, length of wire 4 in., block $7\frac{3}{4} \times 2\frac{1}{4}$ in.	List per gross...	52.00
No. 4	4x10 rows, length of wire 5 in., block $7\frac{3}{4} \times 2\frac{1}{4}$ in.	List per gross...	58.00
No. 5	5x10 rows, length of wire 2 in., block $7\frac{3}{4} \times 2\frac{1}{2}$ in.	List per gross...	51.00
No. 5½	5x10 rows, length of wire 2½ in., block $7\frac{3}{4} \times 2\frac{1}{2}$ in.	List per gross...	53.00
No. 6	5x10 rows, length of wire 3 in., block $7\frac{3}{4} \times 2\frac{1}{2}$ in.	List per gross...	58.00
No. 7	5x10 rows, length of wire 4 in., block $7\frac{3}{4} \times 2\frac{1}{2}$ in.	List per gross...	63.00
No. 8	5x10 rows, length of wire 5 in., block $7\frac{3}{4} \times 2\frac{1}{2}$ in.	List per gross...	72.00
No. 9	5x10 rows, length of wire 6 in., block $7\frac{3}{4} \times 2\frac{1}{2}$ in.	List per gross...	90.00

Casting Brushes will be furnished with leather straps, when desired.

List per gross.....extra, \$7.00

RICE'S PATENT BRIDLED CASTING BRUSHES

Made of Flat Tempered Steel Wire

These brushes contain more wire than is used in any ordinary Casting Brush. They are equipped with our Rice's Patent Hinged Bridles. These bridles are fitted to the two rows of wire at each end of the brush, thus minimizing the vibration and stopping the breakage of the wires. This adds considerably to the life of the brushes and the saving is apparent. Although Rice's Patent Bridled Casting Brushes cost a little more than regular Casting Brushes, they will give from two to three times the amount of service.

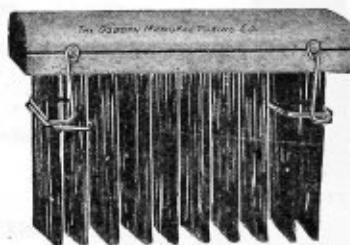


FIG. 3734

This line of brushes contains more wire than is used in any ordinary Casting Brushes.

No. 23	4x10 rows, length of wire 4 in., block $7\frac{1}{2} \times 2\frac{3}{8}$ in.	List per gross...	\$75.00
No. 24	4x10 rows, length of wire 5 in., block $7\frac{1}{2} \times 2\frac{3}{8}$ in.	List per gross...	80.00
No. 27	5x10 rows, length of wire 4 in., block $7\frac{1}{2} \times 2\frac{3}{8}$ in.	List per gross...	88.00
No. 28.	5x10 rows, length of wire 5 in., block $7\frac{1}{2} \times 2\frac{3}{8}$ in.	List per gross...	95.00
No. 29	5x10 rows, length of wire 6 in., block $7\frac{1}{2} \times 2\frac{3}{8}$ in.	List per gross...	102.00

STEEL WIRE ROUND CASTING BRUSHES



FIG. 3735

No.	Dia.	Length		List per gross
		Wire	Over-all	
10	3	5	12	\$73.00
11	3	6	13	81.00

STEEL WIRE GEAR BRUSHES
HANDLED CASTING BRUSHES

FIG. 3736

No.	Rows	Length Wire	Width Block	List per gross
15	4x10	3	2 1/4	\$65.00
20	4x10	4	2 1/4	70.00
16	5x10	3	2 5/8	73.50
21	5x10	4	2 5/8	80.00
26	5x10	5	2 5/8	86.00



FIG. 3737

"ECONOMY" STEEL WIRE WHEEL BRUSHES

Can be run on an ordinary emery grinder. Suitable for cleaning all kinds of castings. Especially designed for Platers, Stove Manufacturers and Hardware Manufacturers. "Economy" Wheel Brushes Complete, including Metal Hub.

No.	Diameter, Inches	Width of Face, Inches	Diameter of Hub, Inches	Shaft Width	List, Each
50C	15	2 1/2	6 1/4	2 3/8	\$19.00
53C	12	2	5	2 3/8	14.00
54C	10	1 3/4	5	2 3/8	13.50
55C	8	1 1/2	4	2	10.30
56C	7	1 1/4	3	1 3/8	9.10
57C	6	1 1/8	3	1 3/8	8.70

SECTIONS OF FILLERS

For "Economy" Steel Wire Wheel Brushes

Section No.	Brush No.	Diam. Section in.	Sections Per set	List Per set
3314	50C	15	6	\$7.50
3411	53C	12	5	6.00
358	54C	10	5	5.50
364	55C	8	4	4.30
373	56C	7	4	3.60
392 1/2	57C	6	4	3.20



FIG. 3738

When ordering, state size of arbor hole required.

No. 50C regularly made for arbors 2 inches diameter and smaller.

Nos. 53C and 54C for arbors 1 1/4 inches diameter and smaller.

Nos. 55C, 56C, and 57C for arbors 1 inch diameter and smaller.

For larger sized arbors, there will be an additional cost.

MOULDER'S HARD OR PATTERN BRUSHES



FIG. 3739

Brush Part $4\frac{1}{2}$ inches Long, Length Overall 10 inches

No.		List Per Gross
310	Extra Stiff Black China Bristle, length of stock $\frac{7}{8}$ inch, 3 rows.....	\$57.50
277	Prepared Stiff Bristle, length of stock 1 inch, 3 rows.....	48.00
278	Grey Tampico, length of stock 1 inch, 4 rows.....	26.00
274	Black China Bristle, length of stock $\frac{7}{8}$ inch, 4 rows.....	52.00
280	Prepared Stiff Bristle, length of stock 1 inch, 4 rows.....	60.00

CORE BOX BRUSHES



FIG. 3740

Solid Blocks, Brush Part $5\frac{1}{2}$ inches Long, Length Overall 12 inches,
Length of Stock 1 inch

No.		List Per Gross
261-A.	Prepared Stiff Bristle, 2 rows, width of block $\frac{5}{8}$ inch	\$23.00
262-A.	Prepared Stiff Bristle, 3 rows, width of block $\frac{7}{8}$ inch	25.00
263-A.	Prepared Stiff Bristle, 4 rows, width of block $1\frac{1}{8}$ inches.....	29.00
265-A.	Prepared Stiff Bristle, 6 rows, width of block $1\frac{1}{2}$ inches.....	46.00

MOULDERS' SOFT BRUSHES



FIG. 3741

250	Pure Black or Grey Hair, length of stock $2\frac{7}{8}$ inches, 4 rows, block 9x1 $\frac{1}{2}$ inches	List per gross \$115.00
-----	---	-------------------------

MOULDERS' DOUBLE BRUSHES



FIG. 3742

No.		List Per Gross
218	Soft Part: Pure Black Hair, length of stock $2\frac{1}{2}$ inches, 4 rows, length of brush part $8\frac{1}{2}$ inches. Top of Hard Part: Grey Tampico, length of stock $1\frac{1}{2}$ inches, 4 rows, length of brush part $4\frac{1}{2}$ inches. Length of block overall 14 inches, width of block 2 inches.....	\$86.50

THE CAPITAL FLOOR BRUSH

Made of pure Russian Bristle, extra heavy and cemented. Block mahogany finish, with two threaded handle holes. Handle polished.



FIG 3743

List Price Per Doz

No. 120, 14 inches.....	\$60.00
No. 121, 16 inches.....	67.50
No. 122, 18 inches.....	75.00

"GACO" FACTORY AND GARAGE BRUSH



FIG 3744

Made on a hardwood, mahogany finished block, with two handle holes and a 5-foot polished handle. This brush is designed especially for factory sweeping or any sweeping on cement floors, rough wood floors and sidewalks.

The center of this brush is made from an imported fibre which cuts the dirt loose and wears like wire. The outside of the brush is made with Tampico Fibre which is the nearest substitute for bristle that can be had.

The Tampico Fibre will remove the finest dirt, and the imported, stiff fibre in the center will cut the dirt loose that bristle or Tampico would skim over.

There is a great demand for a brush that will be satisfactory for this class of sweeping. We recommend this as the most suitable for this class of trade.

Net Price

No. 170, 16 inches long, each.....	\$1.50
No. 171, 18 inches long, each.....	1.75
No. 172, 24 inches long, each.....	2.50

COUNTER OR BENCH BRUSHES

No. 133



FIG. 3745

Our Counter Brushes are made in best hardwood blocks, with handsome finish. The lengths given below are the actual brush part. In all cases the handle is six inches long in addition to the brush lengths given.

No. 129, 8 inches, Gray Fibre	per dozen	\$ 6.87
No. 130, 10 inches, Gray Fibre	per dozen	8.12
No. 131, 8 inches, Black Hair	per dozen	10.00
No. 132, 10 inches, Black Hair	per dozen	11.87
No. 133, 8 inches, China Bristle	per dozen	12.50
No. 134, 10 inches, China Bristle	per dozen	15.00
No. 231, 10 inches, China Bristle, extra stiff	per dozen	22.50
No. 135, 8 inches, Russia Bristle	per dozen	17.50
No. 136, 10 inches, Russia Bristle	per dozen	22.50
No. 137, 12 inches, Russia Bristle	per dozen	25.00

Extra Heavy Mill Sweeps

No. 139, 10 inches, Russia Bristle	per dozen	27.50
No. 140, 12 inches, Russia Bristle	per dozen	31.25

No. 8 BENCH DUSTER



FIG. 3746

Made of Tampico, the most durable fibre known. Better than bristle for heavy work. Designed for shavings, sawdust, iron filings and shop-litter. No pretension to finish; cheap and durable. Handle and block 14 inches, brush 8 inches, with 2½-inch projection. Packed in one, two and three dozen boxes.

List Price, per dozen.....\$4.37

SOLID BACK SCRUBBING BRUSHES



FIG. 3747

SELECTED FIBRE

No. 0, White center, grey wings. Per dozen.....	\$1.10
No. 00, White center, grey wings. Per dozen.....	1.30
No. 1, White center, grey wings. Per dozen.....	1.80
No. 2, White center, grey wings. Per dozen.....	1.85
No. 3, White center, grey wings. Per dozen.....	2.35
No. 4, White center, grey wings. Per dozen.....	2.60
No. 17, Grey fibre. Per dozen.....	2.35
No. 136, Grey fibre. Per dozen.....	3.00
No. 166, Grey fibre. Per dozen.....	1.60
No. 3, Extra. Per dozen.....	3.00

WHITewASH BRUSHES

LEATHER BOUND—DOUBLE NAILED

EXTRA

Double nailed. All Grey Russia Bristle.
Best brush for practical use.

No. 303—8½ in. Per dozen.....	\$28.00
No. 304—9 in. Per dozen.....	36.00



FIG. 3748



FIG. 3749

KNOTTED ROOFING BRUSHES

Used for painting car decks and roofs and particularly suitable for applying tar.

FIBRE

2 Knot. Per dozen.....	\$ 9.00
3 Knot. Per dozen.....	12.00
4 Knot. Per dozen.....	15.00

MIXED

2 Knot. Per dozen.....	\$14.00
3 Knot. Per dozen.....	20.00
4 Knot. Per dozen.....	26.00

PAINTERS WALL BRUSHES

Tin Bound, Cement Set and Nailed

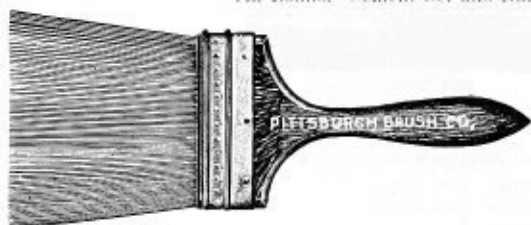


FIG. 3750



FIG. 3751

STUCCO WALL BRUSHES

Leather Bound, Single Nailed



FIG. 3752

INDIA

Red polished handle. Black Russia and Chinese bristle. Very long and full.

No. 25—3 inch.....	per dozen	\$16.00
No. 30—3½ inch.....	per dozen	20.00
No. 35—4 inch.....	per dozen	24.00
No. 40—4½ inch.....	per dozen	28.00

PAINT BRUSHES



FIG. 3753

Extra super-round. All white Russia bristle. Very long and full.

No. 1-0	per dozen	\$14.00
No. 2-0	per dozen	18.00
No. 3-0	per dozen	20.00
No. 4-0	per dozen	25.00
No. 5-0	per dozen	30.00
No. 6-0	per dozen	34.00
No. 7-0	per dozen	38.00
No. 8-0	per dozen	42.00
No. 9-0	per dozen	45.00

EXTRA BLACK

All black Chinese bristle. Nickeled tin ferrule. Hardwood handle, mahogany finish.

3 inch....	per doz.	\$8.00
3½ inch....	per doz.	10.00
4 inch....	per doz.	12.00
4½ inch....	per doz.	14.00

BLACK SUPER

Red polished handle. Very long and full. Black Russia and Chinese bristle.

3 inch....	per doz.	\$14.00
3½ inch....	per doz.	18.00
4 inch....	per doz.	22.00
4½ inch....	per doz.	24.00
5 inch....	per doz.	28.00
5½ inch....	per doz.	32.00
6 inch....	per doz.	36.00
6½ inch....	per doz.	40.00

OVAL CHISEL VARNISH BRUSHES



FIG. 3754

BLACK KEYSTONE

Nickel ferrule or patent seamers steel ferrule, black Chinese bristle, neatly chiseled.

No.	1-0	2-0	3-0	4-0	5-0	6-0	7-0	8-0	9-0
Per dozen	\$7.50	8.50	10.00	11.00	12.00	15.00	16.00	19.00	22.00

FLAT BRISTLE VARNISH BRUSHES



FIG. 3755

Chisel point, Nickel bands, Fancy polished cherry handles, Triple thick, Black Chinese bristle. A specially selected brand. This line of varnish brushes is very well known and always gives entire satisfaction.

Width	inches	1	1½	2	2½	3
Per dozen		\$3.20	4.80	6.40	9.00	12.00

CAMEL HAIR MARKING BRUSHES—ROUND



FIG. 3756

No.	1	2	3	4	¼
Per dozen	\$1.00	1.20	1.30	1.50	1.30

COMMON BRISTLE MARKING BRUSHES

Cedar handles, Medium quality. For general use.

No.	1	2	3	4	5	6
Per dozen	\$0.64	.80	.96	1.12	1.32	1.76

GENUINE AFRICAN BASS PUSH BROOMS

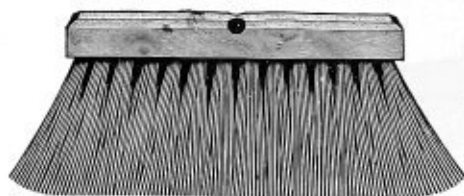


FIG. 3757

Two Handle Holes List Price
Per Doz.

No. 60, 4 rows, 14 in. long...	\$10.00
No. 61, 4 rows, 16 in. long...	11.25
No. 62, 4 rows, 18 in. long...	13.75
No. 63, 5 rows, 14 in. long...	12.50
No. 64, 5 rows, 16 in. long...	13.75
No. 65, 5 rows, 18 in. long...	16.25
No. 82, 4 rows, 20 in. long...	17.50

RATTAN PUSH BROOM



FIG. 3758

Made from best Rattan, which is solidly stapled in block. This method prevents the rattan from coming out, and is much superior to wire-drawn or pitch-set.

Two Handle Holes List Price
Per Doz.

No. 66, 4 rows, 14 in. long...	\$ 8.75
No. 67, 4 rows, 16 in. long...	10.00
No. 68, 4 rows, 18 in. long...	13.75
No. 83, 4 rows, 20 in. long...	15.00
No. 69, 5 rows, 14 in. long...	10.00
No. 70, 5 rows, 16 in. long...	12.50
No. 71, 5 rows, 18 in. long...	15.62

BAMBOO PUSH BROOM



FIG. 3759

Made of Bamboo and solidly stapled as above. The cheapest broom on the market, but renders such splendid service that it is rapidly becoming deservedly popular.

Two Handle Holes List price
Per Doz.

No. 72, 4 rows, 14 in. long...	\$ 7.50
No. 73, 4 rows, 16 in. long...	8.75
No. 74, 4 rows, 18 in. long...	10.62
No. 78, 4 rows, 20 in. long...	12.50
No. 75, 5 rows, 14 in. long...	9.37
No. 76, 5 rows, 16 in. long...	10.62
No. 77, 5 rows, 18 in. long...	12.50

FLAT TEMPERED WIRE PUSH BROOMS



FIG. 3760

Made of Flat Tempered Steel Wire.

No.	Size of Blocks, Inches	Rows	Length of Wire, Inches	List Per Gross	No.	Size of Blocks, Inches	Rows	Length of Wire, Inches	List Per Gross
119	12x2 $\frac{3}{8}$	4	3 $\frac{1}{2}$	\$ 80.00	121A	14x2 $\frac{1}{2}$	5	5	\$134.00
120	12x2 $\frac{3}{8}$	4	5	86.50	122A	16x2 $\frac{1}{2}$	5	5	153.00
121	14x2 $\frac{3}{8}$	4	5	102.00	120B	12x3	6	5	166.00
122	16x2 $\frac{3}{8}$	4	5	115.00	121B	14x3	6	5	194.50
120A	12x2 $\frac{1}{2}$	5	5	115.00	122B	16x3	6	5	223.00

IRON COVERED STEEL WIRE BROOMS

For removing scale from hot iron plates, etc.

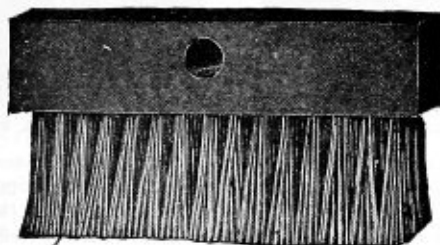


FIG. 3761

EXTRA HEAVY. Made of Very Heavy Flat Tempered Steel Wire.

No.	Block	Size	Length of Wire	Rows	List Per Dozen
130	Block	12x2 $\frac{3}{8}$ inches	4 rows, length of wire 3 $\frac{1}{2}$ inches		\$19.00
131	Block	12x2 $\frac{3}{8}$ inches	4 rows, length of wire 5 inches		20.00
132	Block	14x2 $\frac{3}{8}$ inches	4 rows, length of wire 3 $\frac{1}{2}$ inches		24.00
133	Block	14x2 $\frac{3}{8}$ inches	4 rows, length of wire 5 inches		26.00
134	Block	17x2 $\frac{3}{8}$ inches	4 rows, length of wire 3 $\frac{1}{2}$ inches		30.00
135	Block	17x2 $\frac{3}{8}$ inches	4 rows, length of wire 5 inches		33.00

PUSH BROOM HANDLES

FIG. 3762

These handles are especially selected for use with Push Brooms, the ends being chucked to fit handle holes.

When handles are ordered with Push Brooms, the No. 120 is the one regularly furnished, unless otherwise specified.

No.	Length	Diameter	Material	List Per Gross
120	4 $\frac{1}{2}$ feet long	1 $\frac{1}{8}$ inches	Hardwood	\$14.40
121	5 feet long	1 $\frac{1}{8}$ inches	Hardwood	18.75
122	6 feet long	1 $\frac{1}{8}$ inches	Hardwood	25.25

BROOMS

FOR MILLS, RAILROADS, FACTORIES, ETC.

"BESTOVALL" and
"FORT PITT"

"GAGE SPECIAL" Split Bamboo



FIG. 3763



FIG. 3764

Money can be saved in buying brooms if they are purchased on an economical basis. Economy in buying means, first, the selection of a broom that is best suited for your own service, and second, to select a broom of the highest quality. "BESTOVALL" and "FORT PITT" brooms give 100 per cent efficiency for general work, but for some particular purpose a broom of different construction might give better service. The following pages describe a variety of brooms. Please aim to select what best suits your special requirement, and bear in mind that you are protected by the following:

End View Showing Bamboo Mixture



The above cut shows construction of
"BESTOVALL" and "FORT PITT" Broom.

GUARANTEE

We guarantee our Brooms to be entirely satisfactory in every way. You assume no risk in placing your order with us, for you are at liberty to return within thirty days, at our expense, any Brooms that may prove unsatisfactory or which may fail to measure up to our representation.

Complete Description of Brooms for Every Purpose on Following Pages.

"BESTOVALL" CORN AND BAMBOO MIXED BROOMS

Made in a metal case, from the best of broom corn, with a mixture of imported Bamboo Fibre. Reinforced by an additional metal band and two seams of special wax twine. Is designed for heavy sweepings around factories, foundries, mills and warehouses. Also makes an excellent snow broom. Full 17 inch trim. Weight about 39 pounds per dozen.

"FORT PITT" CORN AND BAMBOO MIXED BROOMS

Our "FORT PITT" Broom is of the same construction as our "BESTOVALL," only lighter in weight. Full 16 inch trim. Weighs about 33 to 34 pounds per dozen. This broom is in popular demand for railroad and street railway use.

"No. 33 SHEET MILL" CORN AND BAMBOO BROOMS

This broom differs from our "BESTOVALL" and "FORT PITT" only in the way the bamboo is mixed with the corn. It has a solid center of bamboo, with corn around outside. Designed for sweeping scale from sheets in tin and sheet mills. We are obligated to the management of a large sheet mill in the Pittsburgh District for the suggestion of a broom for this particular purpose. The increasing demand from this class of trade proves that our "SHEET MILL SPECIAL" is satisfactory for the purpose for which it is designed. Weight about 36 pounds per dozen.

"ALLEGHENY" ALL CORN BROOMS

An all corn metal case broom for light sweeping around warehouses, also very satisfactory for use on trolley cars. Has full 16 inch trim and weighs 29 to 30 pounds per dozen.

"No. 144 ALL CORN" BROOMS

Made in a metal case with metal band and two seams of special wax twine sewing. Designed for heavy sweeping where there is no heavy or bulky rubbish. They give the same rugged service and long wear that you get in the "BESTOVALL" Broom. 16½ inch trim. Weight 35 to 36 pounds per dozen.

"GAGE SPECIAL" ALL BAMBOO BROOMS

The "GAGE SPECIAL," all Japanese Fibre, or commonly called bamboo broom, is made in a metal case, as shown in cut on preceding page. This broom is especially adapted for sweeping or scrubbing brick, rough cement or rough board floors. It is in popular demand for glass factory use, as the fibre will not burn up as quickly as broom corn. It is also largely used by railroads as a snow or switch broom. Full 16 inch trim. Weight, per dozen, 36 pounds.

"MONARCH" SNOW AND SWITCH BROOMS

Made of all round rattan in a metal case. Recommended only as a snow and switch broom. Full 14 inch trim. Weight, per dozen, 30 pounds.

CHISEL HANDLES**FIG. 3767**

Our "GAGE SPECIAL" is the only Chisel Handle Broom carried in stock. Any of our other brooms can be furnished with Chisel Handles for prompt factory shipment if desired. Price, per dozen, extra.....\$3.00

MILL BROOMS

The cut shown here represents the brooms described below. They are made of superior material throughout, sewed with three seams of waterproof twine and made more secure by an electric welded band. High grade handles that will not pull out.

No. 30. All Corn. Weight, per dozen, 30 pounds.

Priceper dozen \$.....

No. 30BM. Corn and Bamboo Mixed. Weight, per dozen, 30 pounds.

Priceper dozen \$.....

No. 36. All Corn. Weight, per dozen, 36 pounds.

Priceper dozen \$.....

No. 36BM. Corn and Bamboo Mixed. Weight, per dozen, 36 pounds.

Priceper dozen \$.....

No. 40. All Corn. Weight, per dozen, 40 pounds.

Priceper dozen \$.....

No. 40BM. Corn and Bamboo Mixed. Weight, per dozen, 40 pounds.

Priceper dozen \$.....



FIG. 3768

HOUSE BROOMS

Made from best selected stemless and soft tip corn. High grade polished maple handles. Colored twine sewing.

No. 4. 4 sewed, polished natural wood handles.

Per dozen \$.....

No. 5. 5 sewed, polished natural wood handles.

Per dozen \$.....

No. 104. 4 sewed, blue enameled handles.

Per dozen \$.....

No. 105. 5 sewed, blue enameled handles.

Per dozen \$.....



FIG. 3769

RAILROAD LANTERNS

"BESTOVALL" No. 39

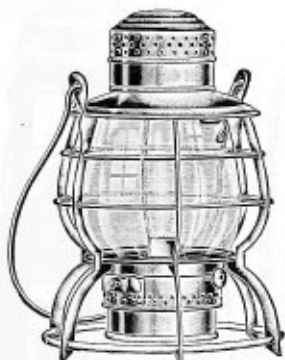


FIG. 3770

"FORT PITT" No. 39



FIG. 3771

"BESTOVALL" NO. 39 RAILROAD LANTERN

Made with a frame of stamped steel, with a double wire guard, and stamped fount and top. The globe is removed through the frame by turning back the hinged top. The wing-lock (slip collar) burner is firmly attached to the fount by patented locking lugs and the fount fastens to the frame by a patented positive-locking device operated by a twist of the hand. Fount has a safety oil well.

For strength and long life, ease in cleaning, filling, lighting and regulating (outside wick raiser) and dependability in making signals, "BESTOVALL" No. 39 Lanterns are unexcelled.

Equipped with No. 2 slip collar wing-lock ratchet burners for burning lard oil or railroad signal oil. Can be fitted with No. 1 wing-lock convex burner for kerosene oil.

Price, without globe.....per dozen \$20.60

"FORT PITT" NO. 39 RAILROAD LANTERN

Same description as "BESTOVALL" except entire frame is made of wire.

Price, without globe.....per dozen \$19.75

"WATCHMAN'S" MILL LANTERN

Watchman's Mill Lantern, burning signal oil, is for use where kerosene is forbidden. It burns the same oil as the common types of Railroad Hand Lanterns.

To prevent a watchman tampering with the flame, the fount and globe are inserted through a hinged top which may be locked to the frame by a small padlock.

An outside wick raiser provides for the regulation of the flame and a wick scraper attachment removes the char. The lantern is nicely finished in Red Enamel.

Price, without globe.....per dozen \$....



FIG. 3772

LANTERNS

No. 2—Cold Blast

No. 6—Tubular



FIG. 3773

No. 2—"Blizzard" Mill



FIG. 3776



FIG. 3774



FIG. 3775

"NO. 6 TUBULAR" HOT BLAST LANTERN

An excellent lantern which will burn under most trying weather conditions. For kerosene. Has No. 411 burner, $\frac{5}{8}$ inch wick, No. 6 globe. Bright tin.....per dozen \$11.25

NO. 2 COLD BLAST LANTERN

A good low-priced lantern for contractors, etc. For kerosene. Has No. 262 burner, 1 inch wick, No. 2 Cold Blast Globe. Bright tin.....per dozen \$15.60

"UNDERWRITERS" MILL LANTERN

Light in weight and strong. Guard may be padlocked, preventing access to flame. For kerosene. No. 421 burner, $\frac{5}{8}$ inch wick, "Fitzall" globe. Red enamel.....per dozen \$30.30

NO. 2 "BLIZZARD" MILL LANTERN

Approved by Insurance Inspection Department. Cold Blast. For kerosene. No. 252 burner, 1 inch wick, "Blizzard" globe. Gives a light of ten candlepower. May be padlocked to prevent access to flame. Finish, red enamel.....per dozen \$43.20

LANTERN BURNERS

No. 262—Kerosene



FIG. 3777

No. 401—Kerosene



FIG. 3779

No. 272—Kerosene



FIG. 3778

No. 2—Wing Lock

Signal Oil

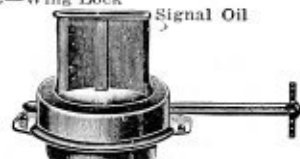


FIG. 3780

No. 1—Wing-Lock
Convex Burner
Kerosene— $\frac{5}{8}$ -inch Wick

FIG. 3781

No. 262.	Blizzard Burner for 1 inch wick.....	price, per dozen	\$1.70
No. 272.	Blizzard Coneless Burner for 1 inch wick.....	price, per dozen	1.70
No. 401.	Fitzall Burners for $\frac{5}{8}$ inch wick.....	price, per dozen	1.20
No. 2.	Wing-Lock Ratchet Burner for 1 inch wick.....	price, per dozen	1.40
No. 1.	Wing-Lock Convex Burner for $\frac{5}{8}$ inch wick.....	price, per dozen	1.10

FLAT LAMP AND LANTERN WICKS

No. 1.	8 inches long, $\frac{5}{8}$ inches wide.....	per gross	\$1.60
No. 2.	8 inches long, 1 inch wide.....	per gross	2.10
No. 3.	8 inches long, $1\frac{1}{2}$ inches wide.....	per gross	3.50

LANTERN GLOBES

No. 0



FIG. 3782

No. 2



FIG. 3783

No. 39



FIG. 3784

No. 0	Tubular, Clear	per dozen	\$....
No. 0	Tubular, Ruby	per dozen	....
No. 2	Cold Blast, Clear	per dozen	....
No. 2	Cold Blast, Ruby	per dozen	....
No. 39	Railroad, Clear	per dozen	....
No. 39	Railroad, Ruby	per dozen	....
No. 39	Railroad, Green	per dozen	....

LANTERNS

"Junior" Wagon



FIG. 3785

"Imperial"



FIG. 3787

"Beacon" Wall

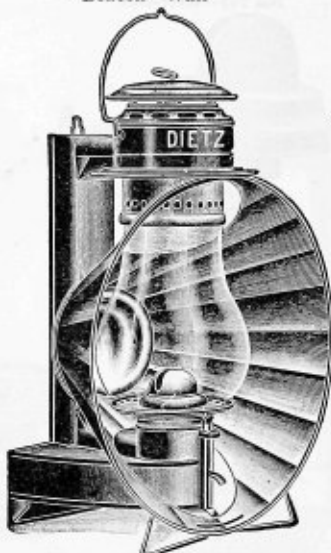


FIG. 3786

JUNIOR WAGON LANTERN

Is but 12 inches high. Made both right and left hand. Shows a 2¼ inch danger signal in rear. Complies with all night driving laws. No. 201 burner, ⅝ inch wick, "Junior" globe. For kerosene. Cold Blast. Black enamel finish..... per dozen \$20.70

BEACON WALL LANTERNS

Have large fluted reflectors and are powerful light givers. Suitable for horse sheds, boat landings, etc. Made in two sizes. For kerosene. Cold Blast. Green enamel finish.

No. 30. Has No. 262 burner, 1 inch wick and Blizzard globe. per doz..\$33.00

No. 60. Has. No. 323 burner, ½ inch wick and No. 2 tubular globe..ea. 8.75

"IMPERIAL" PLATFORM LANTERN

Used on railroad platforms, etc., where a big, safe light is required. Cold Blast. For kerosene. Has No. 303 burner, 1½ inch wick, 8 inch silvered reflector. Green enamel finish.

Priceeach \$12.60

LANTERNS

"Pioneer" Street

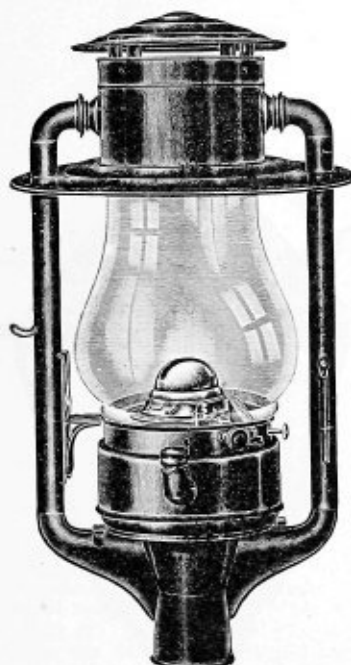


FIG. 3788

"PIONEER" STREET LANTERN

The Standard Platform Lantern. Gives double light of a common gas street lamp. May be filled and regulated from outside and is self-extinguishing. Cold Blast. Has No. 313 burner, 1½ inch wick, "Pioneer" globe. For kerosene. Green enamel. Price.....each \$7.25

"PIONEER" HANGING LANTERN

Same as above, but has bail for hanging and stamped base. Priceeach \$8.75

"Pioneer" Hanging

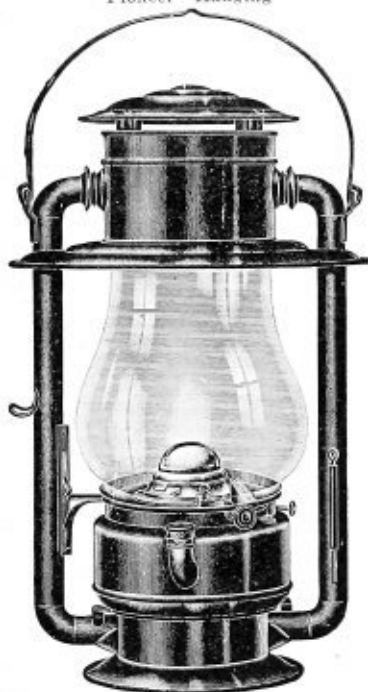


FIG. 3789

BANJO TORCHES

These torches produce an intense white light, far superior to any other in brilliancy. They are indispensable for lighting factories, foundries, machine shops, etc.

- | | |
|--|-------------------|
| No. 10. Single burner vapor or gasoline torches. | |
| List | per dozen \$26.00 |
| No. 11. Single burner coal oil torches. | |
| List | per dozen 28.00 |
| No. 14. Single burner "giant" vapor or gasoline torches. | |
| List | per dozen \$61.00 |
| No. 12. Double burner vapor or gasoline torches. | |
| List | per dozen 52.50 |
| No. 13. Double burner coal oil torches. | |
| List | per dozen 57.50 |



FIG. 3790

STREET LAMPS

Suitable for use with natural gas mantle or tip burners.

Cottage Post Lamp



FIG. 3791

Extra Square Lamp



FIG. 3792

COTTAGE POST LAMP

Height 2 feet 7 inches. Globe $10\frac{1}{4} \times 11\frac{1}{2}$.

Price	each \$ 8.00
Arranged with bracket.....	10.00
Copper Top, extra.....	1.00

EXTRA SIZE SQUARE LAMP

Height 3 feet 5 inches. Width $17\frac{1}{2}$ inches. Double Bars. Heavy galvanized iron top and cast iron sockets.
Priceeach \$12.00

STORM BURNER

With Feeder

$4\frac{1}{2}$ inch Discs. Price, complete.....each \$1.60

This is the original Storm Burner.



FIG. 3793

GAS ARC LAMPS

No. 26—Outdoor



FIG. 3794

No. 25—Outdoor



FIG. 3795

No. 17—Indoor



FIG. 3796

NO. 26. OUTDOOR ARC. Five mantle burner. All adjustable parts are exposed and conveniently situated. Suitable for every outdoor lighting purpose. Glassware 10x7 inch fitter, clear top, frosted or alabaster. Enameled reflector. Enamel housing, absolutely wind, rain and dust proof. List price.....each \$19.00

NO. 25. PORTICO ARC. Single mantle burner. All adjustable parts are exposed and conveniently situated. Suitable for every outdoor lighting purpose. Especially adapted for porches, open halls, private driveways and railway station platforms. Glassware 5x3 3/8 inch fitter, clear and alabaster. Enamel reflector. Enamel housing, absolutely wind, rain and dust proof. List price.....each \$9.50

NO. 17. INDOOR ARC. Can be furnished with either three, four or five mantle burner, for natural or artificial gas. All adjustable parts are exposed and conveniently situated. Glassware 10x7 inch fitter, clear, frosted top and alabaster. Snap globe holder. Housing white enamel.

No. 28—Indoor.



FIG. 3797

No. 17. Five Mantle Arc.

List priceeach \$13.50

No. 18. Three Mantle Arc (same style

as No. 17). List price.....each \$13.00

No. 19. Four Mantle Arc (same style as

No. 17). List price.....each \$13.50

No. 28. NITROLEER ARC. Single

mantle, suitable for interior lighting for Stores, Offices, Hotels, Restaurants, Billiard Halls, Bowling Alleys, in fact, any place of business. All adjustable parts exposed and conveniently situated. Glassware, clear inner chimney. Shade ribbed glass. Spring holder for glassware.

No. 28. Arc. List price...each \$11.00

No. 29. Arc (same as No. 28, except white enamel shade). List price...each \$9.50

No. 27. Arc (same as No. 28, except cone shaped ribbed shade).

List priceeach \$10.50

No. 30 Arc (same as No. 28, except has plain alabaster glass). List price, each \$10.00

ELECTRIC PIPE LINE HEADLIGHTS

No. 69



FIG. 3798

This little headlight was designed to be attached to a telegraph pole running along the right of way of a Pipe Line Company. Serves its purpose of illuminating the pipe very efficiently. Also used to illuminate outside of large oil storage tanks.

Rear view shows method of attaching by removable bracket.

Is weather and water proof, brass castings, all japanned black.

Reflector generally used is 10 inches in diameter and $4\frac{1}{2}$ inches deep, made of brass nickel plated or steel white enameled on inside.

Burns a Tungsten lamp. Thousands of these are in use in Pennsylvania, Texas, Oklahoma, etc.

Also used on Motor Trucks, Patrol Wagons, Boats, etc.

No. 69. With heavy brass nickel plated reflector.....\$....

No. 69A. With heavy steel white enameled reflector.....\$....

No. 69B. With acetylene burner and draft hood.....\$....

NO. 303 16-INCH PORTER STANDARD HEADLIGHT

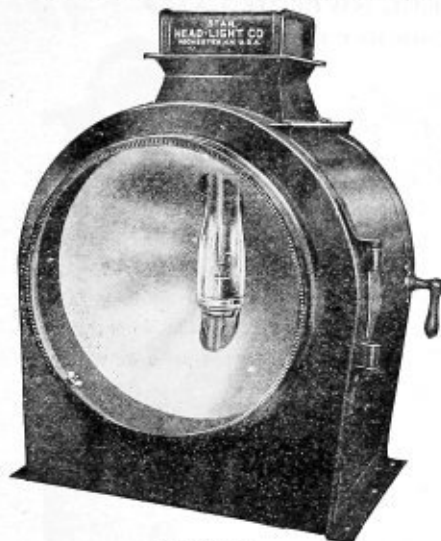


FIG. 3799

Standard with several locomotive builders.

In designing this headlight the lines were so drawn as to get great strength and rigidity as well as pleasing lines.

Size	in. 16	18
Height	in. $14\frac{1}{4} \times 19\frac{3}{4}$	$16\frac{1}{2} \times 22$
Reflector depth,	in. 16x7	18x9
Size, no glass, in.	$6\frac{1}{8} \times 10\frac{3}{8}$	$6\frac{3}{8} \times 10\frac{3}{8}$
Wt., crated..lbs.	75	100
Price	each \$.....	.....

NO. 27 STAR ALL STEEL WABASH PLAIN CASE HEADLIGHT

18 Inch

Height	in. 32
Base	in. 15x21
Slide	in. $16\frac{3}{4} \times 10\frac{3}{4}$
Price	\$.....

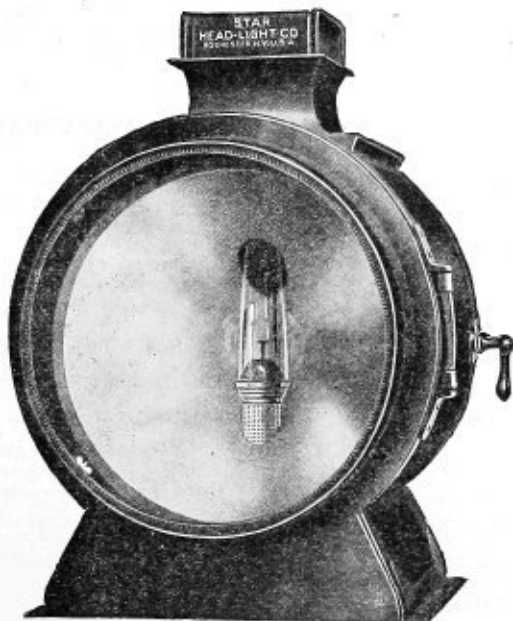


FIG. 3800

**NO. 57 PRESSED STEEL SWITCH LAMP
WITH SPRING SOCKET BASE**

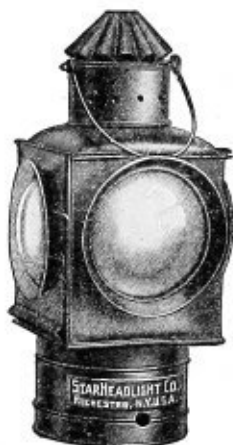


FIG. 3801

The spring device prevents the flame from going out from any jar by passing trains. Non-sweating. Made of heavy steel copper plated and japanned. Equipped with side door or hinged top as desired. Also made with round body with spiral spring fork tubes where fork style stand is used. Outside wick raiser. Fitted with 4, 4½, 5 or 5¾ inch lenses, with or without colored slides.

Priceeach \$.....

NO. 54 JACKS EUREKA TAIL LAMP



FIG. 3802

Has 4 inch red glass or 4 inch semaphore. This is a serviceable and cheap changeable tail light for rear dash.

Very useful for rear end of coal mine trains.
Priceeach \$.....

THE NEW MILBURN CARBIDE LIGHTS

No. 12—12,000 C. P.
No. 8—8,000 C. P.

No. 3U
15,000 C. P.



FIG. 3803

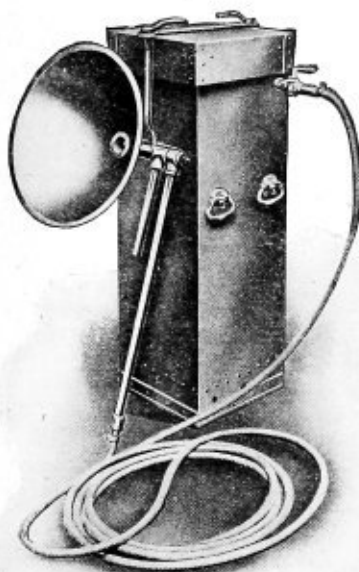


FIG. 3804

The New Milburn Carbide Lights have the following improvements:

1. New Carbide holder one piece, easily filled and emptied; can't be overcharged.
2. No waste of gas by over or after generation.
3. No need to fill with water at every charge.
4. Uses ORDINARY carbide, costing less than special "cakes" and yielding more gas. Can be bought anywhere.
5. Water is automatically expelled from carbide when light is turned off. They burn continuously or intermittently without loss of gas.

The U. S. Government has standardized them for the Navy yards, and for service in France. They are used by leading contractors, railroads, mines, quarries, industrial plants, etc. They give from 1,000 to 15,000 candlepower and light as far as 3,000 feet.

APPROVED BY NATIONAL BOARD OF FIRE UNDERWRITERS

No.	Height	Tank Size Inches	Weight Packed Pounds	Candle Power	Carbide Charge Pounds	Burning Capacity Hours	Cost Per Hour	Price
12	6 ft. 6 in.	12x12x36	112	12,000	12	12 to 18	4c to 5c	\$85.00
8	6 ft.	10x10x30	85	8,000	8	12 to 16	3c to 3½c	70.00
U3	38 in.	12x12x30	140	15,000	16	10	4c to 6c	98.00
Reliance	50 in.	7 (Diam.)x25	32	1,000	1½	12	¾c	35.00

MILBURN HAND LIGHTS

Using ORDINARY Carbide

Milburn Light No. 22

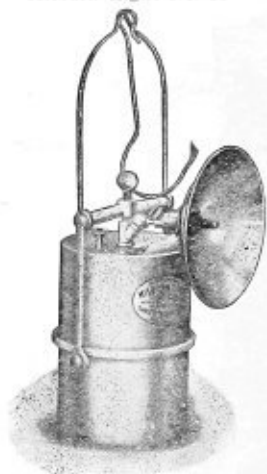


FIG. 3805

Height over ball, 11 in.
 Diameter, 6 in.
 Reflector, 6 in.
 Weight Empty, 3 lb.
 Carbide Charge, 1 lb.
 Burning Capacity, 8 to 12 hr.
 Operating Cost, $\frac{1}{2}$ c per hr.

THE MILBURN "BUILDER" LIGHT

This contractors' acetylene hand light gives 500 candle-power—an illumination of unusual brilliance, producing working conditions equal to daylight. An area of 40 feet radius is brightly lighted.

A polished aluminum reflector, 10 inches in diameter, concentrates the light, while two swing joints on the reflector arm enable it to be directed at any angle up or down.

The "Builder" Light burns 10 hours without recharging and costs about 10 cents per charge. Only carbide and water are required. The body is fitted with a water tight cover. The construction is extremely simple and durable throughout.

Price\$25.00

METAL MINE LAMP NO. 22

This little 100 candle-power lamp is a handy friend on almost any kind of work. Burns 8 hours on a charge. Has a long bail and a hook. Hangs easily at arm's length or hooks anywhere. Strongly made of seamless steel stampings with steel and malleable fittings. May be had with or without reflector, or with special windshield.

The lamp is extremely simple. The water feed is automatic and uniform, generating gas only as needed. It is started and shut off by the needle valve on top. The carbide chamber has a wide mouth for easy charging and dumping. The water chamber has a funnel top, making filling easy, even in the dark. A positive-acting screw cap closes the water inlets and prevents slopping.

Price, without Reflector.....\$ 9.00

Price, with Reflector or Windshield..... 10.00

Milburn "Builder" Light

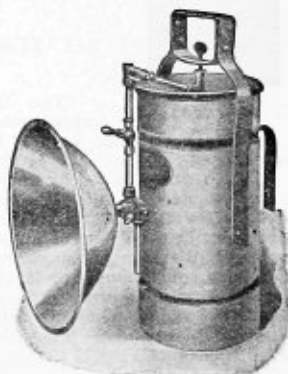


FIG. 3806

500 Candlepower for 10 Hours
 Body, 7x14 inches.
 Reflector, 10 inches in diameter.
 Weight, empty, 11 lb.
 Carbide charge, $2\frac{1}{4}$ lb.
 Operating cost, 1c per hour.

MILBURN OXY-ACETYLENE APPARATUS

Portable Plant on Truck



FIG. 3807

This compact outfit is readily moved anywhere for welding repairs and has ample capacity for every requirement of this kind. It may be taken to the work instead of bringing the work to the plant, often saving heavy dismantling expense. For scrapping structural steel, cars, bridges, ships, etc., its portability is an important factor.

It may be equipped with either a welding or cutting torch, or both, as required. Both gases are supplied from pressure storage tanks, which are exchangeable everywhere when exhausted. The plant may be purchased without the truck for stationary work.

WELDING PLANT

- 1 Model K Welding Torch with 6 tips
- 1 Acetylene Regulator.
- 1 Oxygen Regulator.
- 12½ Ft. Best Acetylene Hose.
- 12½ Ft. Best Oxygen Hose.
- 1 Pair Oxy-Acetylene Goggles.
- 1 Friction Torch Lighter.
- Wrenches.
- Supply Cast Iron and Steel Filler Rods.
- Cast Iron Flux.
- Instructions.

Price (f. o. b. factory).....\$125.00

CUTTING PLANT

- 1 Model F Cutting Torch with 3 tips.
- 1 Acetylene Regulator.
- 1 Oxygen Regulator.
- 12½ Ft. Best Acetylene Hose.
- 12½ Ft. Best Oxygen Hose.
- 1 Pair Oxy-Acetylene Goggles.
- 1 Friction Torch Lighter.
- Wrenches.
- Instructions.

Price (f. o. b. factory).....\$150.00

Truck, \$20.00 extra.

MILBURN OXY-ACETYLENE APPARATUS

"CUT WELD" COMBINATION TORCH



FIG. 3808

An all-purpose torch with tips for cutting and tips for welding—quickly interchangeable by simply unscrewing the nut.

It works speedily and economically with any acetylene gas, generator or cylinder. It is unquestionably the sturdiest torch made—with reinforced head and a design that uses the heat to the best advantage while affording protection to the hand of the operator.

There is absolutely no flash-back. There is no danger of burning the tips, even with its nose deep in the molten metal. The valves are readily accessible and easily cleaned.

The Milburn Cutting Torch is substantially built, well balanced, easy to handle, rapid. It cuts any thickness of metal within range of the process.

The Milburn Welding Torches are the products of years of successful manufacturing. They have been used extensively by the largest plants in the country, and are recognized as the best made.

Price\$75.00

MILBURN WELDING TORCH

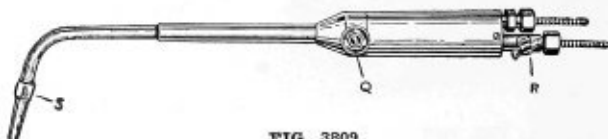


FIG. 3809

This torch produces a uniformly perfect welding flame with greatest possible economy of gases, due to its special method of mixing under accurate control throughout a long chamber. Back-firing at the tip is also eliminated by production of proper gas mixture at positive pressure and by correct design of passages.

Mixing of the gases begins just ahead of the grip, where both the acetylene and oxygen enter a conical chamber under pressure, and continues throughout the passage to the head, being finally perfected within the tip itself. Pressure on the mixture becomes absolutely uniform through this thorough inter-mixing, resulting in great steadiness and fine quality of the flame. Both the operation of the torch and quality of its work are highly satisfactory as the result of these features. Comparison of gas consumption with other torches shows a material saving, and service tests indicate greater speed in accomplishing work.

The Milburn torch is substantially built of tubing and parts having ample weight for strength, but the torch as a whole is of comfortable weight and balance. The arrangement of grip and valves insures ease in handling. It is extremely simple and has few parts. It is finished in polished brass.

Six interchangeable copper welding tips are provided to cover all ordinary ranges of work. Union hose couplings are used, facilitating connection and change of torches.

Price\$40.00

WELDING RODS AND FLUXES.

WELDING RODS

Welding rod is cast in convenient 24-inch lengths for the operator, and in diameter from $\frac{1}{8}$ to $\frac{3}{8}$ inch. They are scientifically prepared from close chemical analysis, and assure a clean, strong, fine grained weld, that can be easily machined. The quality is always maintained to the highest degree because it is sold mostly to users of our welding outfits.

Prices are subject to conditions of the market on raw material.

Norway Iron Welding Rod. Used in welding the best grades of steel, cold-rolled and higher grades of steel, such as shafting, die steel, etc.

Size inches $\frac{1}{8}$ $\frac{3}{16}$ $\frac{1}{4}$
Price per pound \$....

Low Carbon Welding Rod. Used in welding the cheaper grades of steel, such as plates, sheets, angles, etc.



FIG. 3810

Size inches $\frac{1}{8}$ $\frac{3}{16}$ $\frac{1}{4}$
Price per pound \$....

Cast Iron Welding Rod. Used in welding all grades of cast iron.

Size inches $\frac{3}{16}$ $\frac{1}{4}$ $\frac{5}{16}$
Price per pound \$....

Cast Brass Welding Rod. Used in welding yellow brasses, brasses of less than 85 per cent copper mixture. Ordinary brass wire will not do for welding.

Price, $\frac{3}{16}$ inch..... per pound \$.... Price, $\frac{1}{4}$ inch..... per pound \$....

Cast Bronze Welding Rod. Used in welding best grades of brasses. Brass of 85 per cent to 90 per cent copper mixture. This special cast bronze contains deoxidizing and purifying chemicals, which give extra strength by cleaning the weld.

Price, $\frac{3}{16}$ inch..... per pound \$.... Price, $\frac{1}{4}$ inch..... per pound \$....

Cast Tobin Bronze Welding Rod. For welding cheaper grades of malleable iron, also to fill blowholes in hard bronze castings, etc.

Price, $\frac{3}{16}$ inch..... per pound \$.... Price, $\frac{1}{4}$ inch..... per pound \$....

Cast Manganese Bronze Welding Rod. Used in welding the best grades of malleable iron. Unexcelled for malleable iron brazing. In fact, a tough malleable bronze that gives very good joints with iron of all kinds.

Size inches $\frac{3}{16}$ $\frac{1}{4}$ $\frac{5}{16}$
Price per pound \$....

Cast Aluminum Welding Rod. Aluminum welding, the most difficult of all, requires very carefully picked rods.

Price, $\frac{3}{16}$ inch..... per pound \$.... Price, $\frac{1}{4}$ inch..... per pound \$....

Cast Copper Rod. Price, $\frac{3}{16}$ in., per pound \$.... Price, $\frac{1}{4}$ in., per pound \$....

FLUXES

Scientifically and especially prepared for use in welding with the different rods.

Price, Copper, Bronze and Brass Flux..... per pound \$....

Price, Cast Iron Flux..... per pound \$....

Price, Aluminum Flux..... per pound \$....

Packed in either $\frac{1}{2}$ or 1-pound sealed tin boxes.

GAS FIXTURE FITTINGS

IRON PIPE SIZES



FIG. 3812



FIG. 3813

Hose Cock (Female)

No. 5171.	$\frac{3}{4}$ inch.....	per doz.	\$4.00
No. 5068.	$\frac{1}{2}$ inch.....	per doz.	2.60
No. 5069.	$\frac{3}{8}$ inch.....	per doz.	2.45
No. 5070.	$\frac{1}{4}$ inch.....	per doz.	2.25
No. 5071.	$\frac{1}{8}$ inch.....	per doz.	2.10

Hose Cock (Male)

No. 5189.	$\frac{3}{4}$ inch.....	per doz.	\$4.50
No. 5072.	$\frac{1}{2}$ inch.....	per doz.	2.75
No. 5073.	$\frac{3}{8}$ inch.....	per doz.	2.60
No. 5074.	$\frac{1}{4}$ inch.....	per doz.	2.45
No. 5075.	$\frac{1}{8}$ inch.....	per doz.	2.25

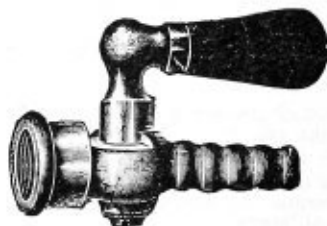


FIG. 3814

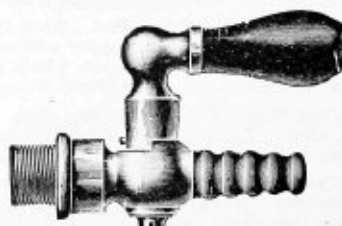


FIG. 3815

Nickel Plated

Hose Cock

Wood Handle (Female)

No. 6889.	$\frac{1}{2}$ inch.....	per 100	\$35.00
No. 6890.	$\frac{3}{8}$ inch.....	per 100	32.00
No. 6891.	$\frac{1}{4}$ inch.....	per 100	25.00
No. 6892.	$\frac{1}{8}$ inch.....	per 100	25.00

Hose Cock

Wood Handle (Male)

No. 6893.	$\frac{1}{2}$ inch.....	per 100	\$40.00
No. 6894.	$\frac{3}{8}$ inch.....	per 100	35.00
No. 6895.	$\frac{1}{4}$ inch.....	per 100	30.00
No. 6896.	$\frac{1}{8}$ inch.....	per 100	30.00

GAS FIXTURE FITTINGS **IRON PIPE SIZES**

Two-Light Bracket or Y Body



FIG. 3816
No. 270

$\frac{3}{8} \times \frac{3}{8}$ Doz. \$1.95

Hose End (male)



FIG. 3817

No.		Doz.
5322	$\frac{3}{4}$ male.....	\$3.50
5323	$\frac{1}{2}$ male.....	1.50
5324	$\frac{3}{8}$ male.....	1.25
5325	$\frac{1}{4}$ male.....	1.10
5326	$\frac{1}{8}$ male.....	1.00

Hose End (female)



FIG. 3818

No.		Doz.
5327	$\frac{3}{4}$	\$3.00
5328	$\frac{1}{2}$	1.50
5329	$\frac{3}{8}$	1.25
5330	$\frac{1}{4}$	1.10
5331	$\frac{1}{8}$	1.00

Independent Cock

Brass Chandelier Hook (Female)



FIG. 3819

No.		Doz.
5368	$\frac{1}{2}$	\$1.60
5369	$\frac{3}{8}$	1.45
5370	$\frac{1}{4}$	1.45
5371	$\frac{1}{8}$	1.45

Brass Chandelier Hook (Male)



FIG. 3820

No.		Doz.
5372	$\frac{1}{2}$	\$1.60
5373	$\frac{3}{8}$	1.45
5374	$\frac{1}{4}$	1.45
5375	$\frac{1}{8}$	1.45



FIG. 3821

No.		Doz.
5846	$\frac{3}{4} \times \frac{3}{4}$	\$7.00
5063	$\frac{1}{2} \times \frac{1}{2}$	4.00
5172	$\frac{1}{2} \times \frac{3}{8}$	4.00
5064	$\frac{3}{8} \times \frac{3}{8}$	3.25
5065	$\frac{1}{4} \times \frac{1}{4}$	3.00
5066	$\frac{1}{8} \times \frac{1}{8}$	2.75

Pillar Cock (male)



FIG. 3823

No.		Doz.
5125	$\frac{1}{2}$ to Burner.....	\$3.10
5126	$\frac{3}{8}$ to Burner.....	2.75
5127	$\frac{1}{4}$ to Burner.....	2.60
5128	$\frac{1}{8}$ to Burner.....	2.45

Independent Cock for Burner



FIG. 3822

5067 $\frac{3}{8} \times \frac{3}{8}$ \$3.25

L Pendant Cock



FIG. 3824

No.		Doz.
5082	$\frac{3}{8} \times \frac{3}{8}$	\$3.10
5083	$\frac{3}{8} \times \frac{1}{4}$	2.60
5084	$\frac{3}{8} \times \frac{3}{8}$	2.60
5085	$\frac{1}{4} \times \frac{1}{4}$	2.60
5086	$\frac{1}{4} \times \frac{1}{8}$	2.45
5087	$\frac{1}{8} \times \frac{1}{8}$	2.45

GAS FIXTURE FITTINGS

IRON PIPE SIZES



FIG. 3825



FIG. 3826

Two-Light Pendant Cock

No. 5148.	$\frac{1}{2} \times \frac{1}{2}$	per doz.	\$2.80
No. 5149.	$\frac{3}{8} \times \frac{3}{8}$	per doz.	2.45
No. 5150.	$\frac{3}{8} \times \frac{1}{4}$	per doz.	2.25
No. 5151.	$\frac{3}{8} \times \frac{1}{8}$	per doz.	2.25
No. 5152.	$\frac{1}{4} \times \frac{1}{4}$	per doz.	2.25
No. 5153.	$\frac{1}{4} \times \frac{1}{8}$	per doz.	2.10
No. 5154.	$\frac{1}{8} \times \frac{1}{8}$	per doz.	1.95

No. 5088.	$\frac{1}{2} \times \frac{3}{8}$	per doz.	\$5.30
No. 5089.	$\frac{3}{8} \times \frac{3}{8}$	per doz.	5.05
No. 5090.	$\frac{3}{8} \times \frac{1}{4}$	per doz.	4.55
No. 5091.	$\frac{3}{8} \times \frac{1}{8}$	per doz.	4.55
No. 5092.	$\frac{1}{4} \times \frac{1}{4}$	per doz.	4.55
No. 5093.	$\frac{1}{4} \times \frac{1}{8}$	per doz.	4.20
No. 5094.	$\frac{1}{8} \times \frac{1}{8}$	per doz.	4.20



FIG. 3827



FIG. 3828

Revolving Pendant Cock

No. 5135.	$\frac{3}{8} \times \frac{3}{8}$	per doz.	\$4.25
No. 5136.	$\frac{3}{8} \times \frac{1}{4}$	per doz.	4.05
No. 5137.	$\frac{3}{8} \times \frac{1}{8}$	per doz.	3.90
No. 5138.	$\frac{1}{4} \times \frac{1}{4}$	per doz.	3.75
No. 5139.	$\frac{1}{4} \times \frac{1}{8}$	per doz.	3.55
No. 5140.	$\frac{1}{8} \times \frac{1}{8}$	per doz.	3.55

Bracket Swing Cock

No. 5095.	$\frac{3}{8} \times \frac{3}{8}$	per doz.	\$4.55
No. 5096.	$\frac{3}{8} \times \frac{1}{4}$	per doz.	4.20
No. 5097.	$\frac{3}{8} \times \frac{1}{8}$	per doz.	4.05
No. 5098.	$\frac{1}{4} \times \frac{1}{4}$	per doz.	4.05
No. 5099.	$\frac{1}{4} \times \frac{1}{8}$	per doz.	3.90
No. 5100.	$\frac{1}{8} \times \frac{1}{8}$	per doz.	3.90

GAS BURNERS, CUPS, TIPS, ETC.

Burner Cup

Bracket Back



FIG. 3829



FIG. 3830

STAMPED BURNER CUPS

Dipped and Lacquered.....per gross \$1.25

STAMPED BRACKET BACKS

No. 616, 2½ inch, Dipped and Lacquered.....per gross \$2.00

No. 617, 3 inch, Dipped and Lacquered.....per gross 3.00

Lava Gas Tip

E. H. LAVA GAS TIPS

Per gross\$1.25

BRASS PILLAR

Per gross\$1.50

Brass Pillar



FIG. 3831

Jumbo



FIG. 3832

JUMBO BURNER

For Natural Gas—40, 60, and 80 Candle Power

No. 673. Burner ...Per gross \$9.00 Per doz. \$1.00

No. 1808. TipPer gross 5.00 Per doz. .50

No. 1809. Pillar ...Per gross 4.00 Per doz. .40



FIG. 3833

THE TODD BURNER

For Natural Gas.

The Todd Burner is made of the best cast steel and is virtually indestructible; is so constructed that the air supplied to the flame is thoroughly superheated while the gas is supplied at a nominal heat, thereby insuring a perfect mixture of air and gas at a point of combustion, and preventing any deposit of soot and graphite on the burner. The No. 1, or large size burner, consumes from 33 to 40 feet of natural gas per hour, and produces a light 10 to 11 inches in diameter, of about 200 candle power. It is especially adapted for general lighting in mills, machine shops, foundries, large works and open street lights. When encased in a large lantern, it is an excellent light for front of hotels, stores or public buildings. The No. 2, or small size burner, is constructed on the same principle as the No. 1; consumes from 9 to 12 feet of gas per hour, and gives a light of 16 candle power. This size is designed especially for bench or shop light, and for use in stores and dwellings, where they are giving entire satisfaction. This burner can be placed on the ordinary gas-burner connection.



FIG. 3834

No. 1 Large Burner, complete with nipple and valve.....list per dozen \$30.00

No. 2 Small Burner, complete with nipple and valve.....list per dozen 13.50

No. 1 Large Burners only.....list per dozen 25.20

No. 2 Small Burners only.....list per dozen 9.00

Nipples for either size of Burner.....list each .10

Needle Valves for either size of Burner.....list each .40

STAPLE GAS BRACKETS ROPE TUBE



FIG. 3835

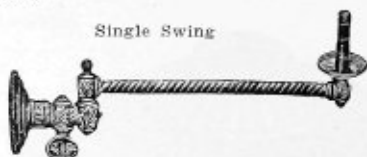


FIG. 3836

List
Price
No. 1602. 6-inch Gilt.....each \$0.60
No. 1604. 8-inch Gilt.....each .70

List
Price
No. 1607. Gilteach \$0.90

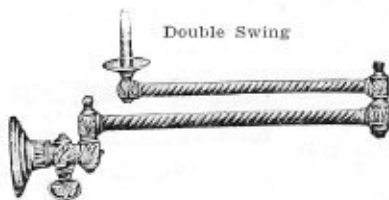


FIG. 3837

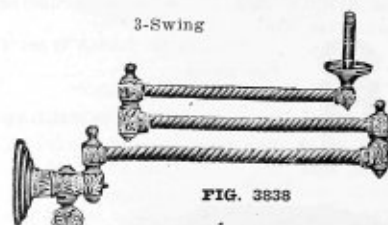


FIG. 3838

No. 1608. Gilteach \$1.50 No. 1609. Gilteach \$2.20

SQUARE TUBE BRACKETS

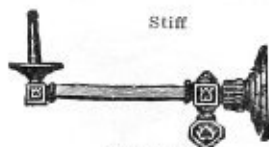


FIG. 3839

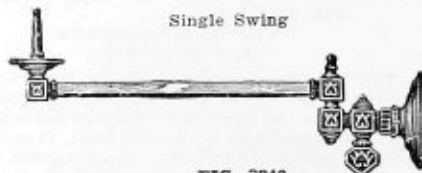


FIG. 3840

No. 5032. Stiff, 7 in., polished, ea. \$1.30
No. 5187. Stiff, 8 in., polished, ea. 1.50 No. 5035. Polishedeach \$1.80

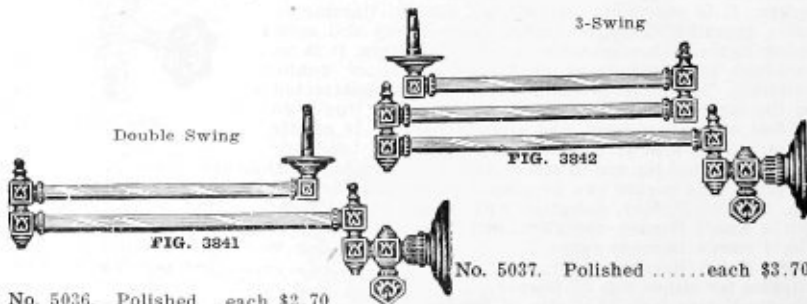


FIG. 3841

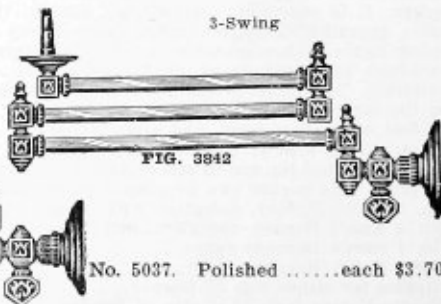


FIG. 3842

No. 5036. Polished each \$2.70

No. 5037. Polishedeach \$3.70

GAS MANTLES

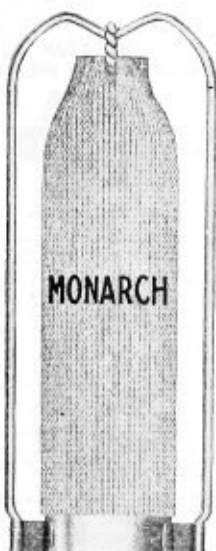


FIG. 3843



FIG. 3844



FIG. 3845



FIG. 3846

"MONARCH"—Mounted on cap with double nickel wire support. Extra brilliant, powerful and durable. Single weave.

List price.....per dozen, \$1.80

"FORT PITT"—Double weave. Extra strong and durable. Mounted on cap with double nickel wire support.

List price.....per dozen, \$2.70

"BESTOVALL"—Triple weave. Red. High grade. Mounted on cap with double nickel wire support.

List price.....per dozen, \$3.50

"BUCKEYE"—Single weave. Unshrinkable. Mounted on cap with double nickel wire support.

List price.....per dozen, \$2.25

4½ dozen (50) mantles in a box.

NATURAL GAS GOODS. KITANNING MIXING CHAMBERS.

PLAIN
Solid Pin

FIG. 3847

HEXAGON
Solid Pin

FIG. 3848

HEXAGON
Loose Pin

FIG. 3849

HEXAGON
Solid Pin, with Set Screw

FIG. 3850

Description	ROUGH		FINISHED		NICKEL PLATED	
	Solid Pin	Loose Pin	Solid Pin	Loose Pin	Solid Pin	Loose Pin
Price, Plain, 1x $\frac{3}{8}$ or $\frac{1}{2}$ -inch	.30	.35	.35	.40	.45	.50
" " 1 $\frac{1}{4}$ x $\frac{3}{8}$ or $\frac{1}{2}$ -inch	.40	.45	.45	.50	.55	.60
" Hexagon, 1x $\frac{3}{8}$ or $\frac{1}{2}$ -inch	.35	.40	.40	.45	.50	.55
" " 1 $\frac{1}{4}$ x $\frac{3}{8}$ or $\frac{1}{2}$ -inch	.45	.50	.50	.55	.60	.65
" " 1 $\frac{1}{2}$ x $\frac{3}{8}$ or $\frac{1}{2}$ -inch	.55	.60	.60	.65	.75	.80
" " Set Screw, 1x $\frac{3}{8}$ or $\frac{1}{2}$ -inch	.40	.....	.45	.....	.55	.....
" " " 1 $\frac{1}{4}$ x $\frac{3}{8}$ or $\frac{1}{2}$ -inch	.50	.....	.55	.....	.65	.....
" " " 1 $\frac{1}{2}$ x $\frac{3}{8}$ or $\frac{1}{2}$ -inch	.60	.....	.65	.....	.80	.....

MIXER PINS

Mixer Pins, $\frac{3}{8}$ or $\frac{1}{2}$ -inch..... Price, each .15

MIXING CHAMBERS

GLOBE



FIG. 3551

HALF GLOBE
Loose Pin

FIG. 3852

OPEN SIDE
With Set Screw

FIG. 3853

LOCK SHIELD
Loose Pin

FIG. 3854

Description	ROUGH	FINISHED	NICKEL PLATED
Price Globe, 1x $\frac{3}{8}$ or $\frac{1}{2}$ -inch	.50	.65	.80
" " 1 $\frac{1}{4}$ x $\frac{3}{8}$ or $\frac{1}{2}$ -inch	.55	.70	.85
" " 1 $\frac{1}{2}$ x $\frac{3}{8}$ or $\frac{1}{2}$ -inch	.65	.80	1.00
" Half Globe 1x $\frac{3}{8}$ or $\frac{1}{2}$ -inch	.65	.75	.85
" " 1 $\frac{1}{4}$ x $\frac{3}{8}$ or $\frac{1}{2}$ -inch	.75	.85	.95
" Open Side 1x $\frac{3}{8}$ or $\frac{1}{2}$ -inch	.40	.45	.60
" " 1 $\frac{1}{4}$ x $\frac{3}{8}$ or $\frac{1}{2}$ -inch	.50	.60	.70
" Adjustable Ring 1x $\frac{3}{8}$ or $\frac{1}{2}$ -inch .....	.....	.70	.80

MUSHROOM WITH SHIELD



FIG. 3855

MUSHROOM MIXING CHAMBER

CAST IRON

Size 1 $\frac{1}{2}$ x1

Size 2 x1

each \$0.40

each .45

GAS MIXERS
DIAMOND SHAPE ADJUSTABLE MIXER WITH GLOBE VALVE



FIG. 3857

Size, $\frac{3}{8}$ x $\frac{3}{4}$ inch	list price \$1.20
Size, $\frac{3}{8}$ x 1 inch	list price 1.40
Size, $\frac{3}{8}$ x $1\frac{1}{4}$ inch	list price 1.50

We can furnish lock shield valve with key, instead of globe valve, as shown in cut, if desired, at additional cost.

"ADVANCE" FRANKLIN VALVE AND MIXER.
BRASS, WITH SET SCREW.



FIG. 3858

Size, $\frac{3}{8}$ x $\frac{3}{4}$ inch	list price \$0.60
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GAS BURNERS

ONE-PIECE SOLID ROUND BURNERS

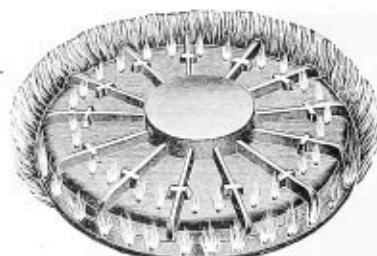


FIG. 3859

All Round Burners drilled on side and top unless otherwise ordered.

1 1/4 inch inflow unless otherwise ordered.

No. 7.	4 in. diam.	price	\$0.60
No. 10.	6 in. diam.	price	.75
No. 11.	7 in. diam.	price	1.00
No. 12.	8 in. diam.	price	1.25
No. 13.	10 in. diam.	price	1.50
No. 14.	12 in. diam.	price	2.00
No. 15.	15 in. diam. Made in 2 half round pieces.	price	3.00
No. 16.	18 in. diam. Made in 2 half round pieces.	price	4.00

ONE-PIECE RECTANGULAR BURNER



FIG. 3860

End and center inflow. 1 1/4 inch inflow unless otherwise ordered. Can be had with 1 inch inflow if desired.

No. 0.	4x10	price	\$1.10
No. 1.	4x12	price	1.25
No. 2.	4x14	price	1.50
No. 3.	4x16	price	1.75
No. 4.	4x18	price	2.00
No. 5.	5x20	price	2.25
No. 6.	6x22	price	3.00

ONE-PIECE SPLIT RING BURNER



FIG. 3861

4 inch.	1/2 inch side inflow.	price	\$0.50
5 inch.	1/2 inch side inflow.	price	.50
5 inch.	3/4 inch side inflow.	price	.55
6 inch.	3/4 inch side inflow.	price	.65
8 inch.	1 inch side inflow.	price	1.00

These burners are very convenient and useful for placing under vertical boilers for hot water, as there is no need of disconnecting the pipes as with other burners.

ONE-PIECE RING BURNER SIDE INFLOW



FIG. 3862

4 inch.	1/2 inch side inflow.	price	\$0.50
5 inch.	3/4 inch side inflow.	price	.60
6 inch.	3/4 inch side inflow.	price	.70
8 inch.	1 inch side inflow.	price	1.10

All Ring Burners drilled on top unless otherwise ordered. Specially adapted for attaching close to cover of Range or Cook Stove and Water Heaters.

GAS BURNERS



FIG. 3863

RING FURNACE BURNER

Size in.—

12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30

List price—

\$2.00 | 2.50 | 3.00 | 3.75 | 4.50 | 5.25 | 6.00 | 7.00 | 8.50 | 10.00

These Burners made in two sections, excepting the 26 inch, 28 inch and 30 inch, these sizes are made in three sections. Each section tapped 1½ inch at side and bottom.

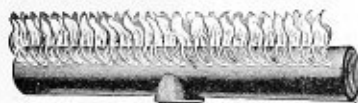


FIG. 3864

WATER BACK TUBE BURNER

Tapped 1 inch at end and center. Plug furnished.

Size, inches	10	12	14	16	18
List price	\$0.75	.80	.90	1.00	1.25

CROWN RING FURNACE BURNERS

One Section



FIG. 3865

Two Section



FIG. 3866

ONE-SECTION RING BURNERS

One section 3 Crown Burners for 8 to 10 in. fire pit.....	List Price \$2.80
One section 5 Crown Burners for 10 to 12 in. fire pit.....	List Price 4.60
One section 6 Crown Burners for 12 to 14 in. fire pit.....	List Price 5.80

TWO AND THREE-SECTION RING BURNERS

Two section 10 Crown Burners for 16 to 17 in. fire pit.....	List Price \$ 9.80
Two section 14 Crown Burners for 18 to 19 in. fire pit.....	List Price 11.40
Two section 16 Crown Burners for 20 to 21 in. fire pit.....	List Price 12.80
Three section 18 Crown Burners for 22 to 24 in. fire pit.....	List Price 14.00
Three section 20 and 22 Crown Burners for 26 to 30 in. fire pit....	List Price 16.00

The above cuts illustrate Crown Ring Furnace Burners, consisting of a series of Crown Burners mounted on a ring. Each Crown Burner is complete in itself, and when assembled in different combinations as listed above, makes a very effective and economic Burner for use in steam or hot water boilers and hot air furnaces.

All inflows tapped 1 inch.

KIRKWOOD NATURAL GAS BURNERS

FOR HEATING, ANNEALING, TEMPERING AND MELTING
FURNACES AND FORGES

Used for any kind of work where heat control must be assured at all times.

Can be applied to any type of furnace.

Kirkwood Natural Gas burners are guaranteed to be made of the best materials and to render efficiently, the service for which they are made.

The burner consists of an outer and inner casing. The space between these casings contains a number of small pipes, perforated with very fine holes and placed spirally. The gas enters the space between the casings, then into the pipes and issues through the small holes in a number of fine jets, mixes with the air blown through the burner and produces a thorough mixture of air and gas of the right proportions for combustion.

An air blast of 4 to 6 ounces pressure is introduced in back of the burner and is regulated by the blast gate on the burner.



FIG. 3867

TABLE OF SIZES AND CAPACITIES

Size	Capac. in cubic ft. per min. at			Size Gas Pipe	Size Air Connection*		Weight
	4 oz.	6 oz.	8 oz.		Slip	Thread	
1½ in.	4	5	6	½ in.	.....	1¼ in.	10 lb.
2 in.	11	13	15	¾ in.	2½ in.	2 in.	16 lb.
3 in.	18	22	25	1½ in.	3½ in.	3 in.	28 lb.
5 in.	119	145	170	2 in.	6 in.	.....	75 lb.

*2-in. and 3-in. burners are supplied with slip connections for galvanized sheet pipe or threaded connections for standard wrought iron pipe.

KIRKWOOD NATURAL GAS BURNERS

FOR STEAM BOILERS



FIG. 3868

The burner illustrated here consists of an outer and inner casing and a nozzle. Into the inner casing is driven a large number of small brass spuds, which are drilled half way through in two directions. These two holes meet and form a passage for the gas from the space between the casings to the inner cylindrical space of the burner. The gas enters the column of air in a number of very fine jets and mixes thoroughly with the air forming an absolutely correct mixture for combustion.

The burner is strongly made; will not get out of order or become clogged; spuds will not rust. Stands shipment and rough usage of the boiler room. Works under gas pressure of 2 to 8 ounces.

Shipped complete with Stop Cock, Graduated Dial and Handle.

STANDARD SIZES KIRKWOOD GAS BURNERS

Size, Inches	Boiler Capacity, H. P.	Gas Connection Size	Maximum Capacity Cubic Feet per Minute			Shipping Weight
			4 oz. Air	6 oz. Air	8 oz. Air	
5 in.	25	1½ in.	29	37	42	75
3 in.	15	1½ in.	8½	11	12½	28
2 in.	8	¾ in.	4¼	5¼	6	16

TATE-JONES OIL BURNERS FOR HEAT TREATING FURNACES

The illustration shows the No. 6 fitted with cast iron funnel and yoke for attaching to the furnace. It can be supplied with a tuyere casting for building into a brick wall instead of the funnel and yoke. This burner can be used with all types of furnaces as well as dryers and ovens.

The oil supply is controlled by a needle valve in the burner proper. The supply of compressed air (or steam) for perfect atomization, is controlled by a suitable valve on the supply line. The burner will operate on a wide range of pressures from 5 pounds up on the oil and 10 pounds and up on the atomizing agent.

As the control of oil and atomizing agent are separate, this burner is to be recommended where it is impractical to maintain uniform pressure on the oil. At 15 pounds pressure, the working limit of this burner is 1—10 gallons per hour. Net weight, 2 pounds. Size of oil inlet and size of steam inlet, each $\frac{3}{4}$ in.



FIG. 3869

TATE-JONES COMBINATION NATURAL GAS AND OIL BURNERS FOR HEAT TREATING FURNACES NO. 7



FIG. 3870

This is a combination gas and oil burner that is valuable where the immediate shifting from gas to oil, or oil to gas is necessary.

Burns oil at 20—25 lbs. pressure; compressed air or dry steam for atomization at 15 to 20 pounds; air for combustion at 4—6 oz. pressure. Simply turn the handle and the proper mixture of oil and atomizing agent is automatically made. Not noisy in operation.

At the top of the oil burner, a gas chamber is attached, from the top of which, the gas connection is made.

Burners are properly adjusted before leaving the factory. Ignorance or lack of skill cannot impair the adjustment.

TATE-JONES OIL BURNER B-8

This burner is particularly adapted for use under boilers, though it can be used under stills and in many different kinds of furnaces. The handle of the burner proper controls the oil supply by means of a needle valve close to the point where the oil leaves the burner, thus maintaining the full pressure on the oil at the point of exit. The steam supply is controlled by means of a valve in the steam line close to the burner. The steam completely surrounds the oil, keeping it at the same temperature as the steam. The most successful results are obtained by arranging the nozzle length and nozzle tip to suit each particular installation. Supplied in 3 sizes rated at 25, 75, and 175 Boiler H. P.



FIG. 3871

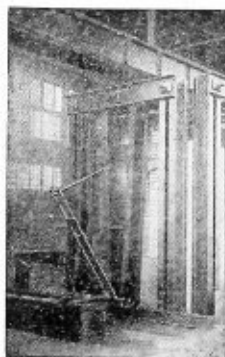


FIG. 3872

TATE-JONES OPEN HEARTH OIL BURNER

(SWINGING TYPE)

One burner is placed in each end of the furnace and they are arranged so they can be readily swung out of position when the furnace is reversed. This burner is also supplied in the water cooled type for use where construction of the furnace does not permit the use of swinging type equipment.

TATE-JONES REVERSING VALVE STAND

(For use with open hearth furnaces)

This stand is located on the charging floor and reverses the flow of oil and atomizing agent when the furnace is reversed. The atomizing agent is reversed by means of a three-way cock. On the oil side, a cross needle valve is fitted to regulate the amount of oil passed. The flow of oil from burner to burner is reversed by opening or closing two other valves on the stand and without varying the amount of oil being fed. The valve stems are protected. Gauges for indicating the pressure of oil and the pressure of the atomizing agent are mounted on the stand.

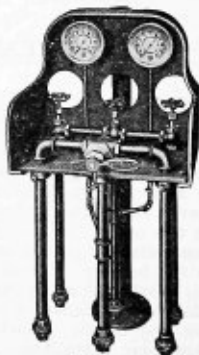


FIG. 3873

TATE-JONES PUMPING SYSTEMS FOR OIL BURNING INSTALLATIONS

Steam driven. They deliver the oil from tanks to burners at the proper pressure and in the right condition for the most effective use. The system is fitted with strainers that remove any foreign matter that might clog the piping or burners. These strainers can easily be cleaned. Exhaust steam is used to preheat the oil as it passes through a coil in the body of the system. The pulsations of the pump are compensated for by an air dome. Relief valve permits any pressure desired. A steady and uniform flow of oil at the right pressure and temperature is assured.

All systems except S-1 are fitted with duplicate pumps so that with one pump disabled, the other one can be used, thus preventing a shut down. These pumping systems are made of the best materials in the most skillful manner, and are guaranteed to efficiently and satisfactorily perform the work for which they are intended.

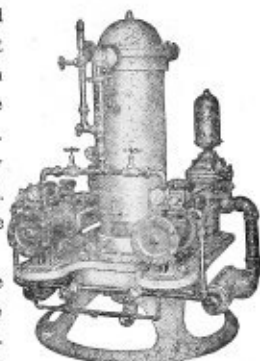


FIG. 3874

SIZES AND CAPACITIES—STEAM-DRIVEN PUMPING SYSTEMS

The capacities given here are very conservative ratings and are figured on only one pump operating at a time.

No.	No. Pumps	Size of Pumps	Capacity Gallons Per Hour	Pipe Sizes				Floor Space	Height	Shipping Weight Lbs.
				Suction	Discharge	Overflow	Steam			
S-1	1	3 "x1 $\frac{1}{4}$ "x3"	160	1 "	1 "	3 $\frac{3}{4}$ "	3 $\frac{3}{4}$ "	22 $\frac{1}{2}$ "x21"	4'0"	480
S-2	2	3 "x1 $\frac{1}{4}$ "x3"	160	1 "	1 "	3 $\frac{3}{4}$ "	1 $\frac{1}{2}$ "	22 $\frac{1}{2}$ "x21"	4'0"	550
S-3	2	4 "x2 $\frac{1}{2}$ "x5"	500	1 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "	39 "x34"	4'9"	1250
S-4	2	5 "x3 "x6"	800	2 "	1 $\frac{1}{4}$ "	1 $\frac{1}{4}$ "	1 $\frac{1}{2}$ "	42 "x46"	6'7"	1550
S-5	2	5 $\frac{1}{2}$ "x3 $\frac{1}{2}$ "x7"	1100	2 $\frac{1}{2}$ "	2 "	1 $\frac{1}{4}$ "	3 $\frac{3}{4}$ "	51 "x51"	6'7"	2650

Can also supply Motor or Belt Driven Systems.

FULTON GAS REGULATORS

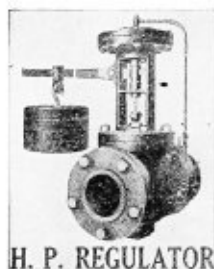


FIG. 3875



FIG. 3876



FIG. 3877

PRICES ON ABOVE REGULATORS

Inlet .....ins.	1	1 1/4	1 1/2	2	2 1/2	3	4
Outlet .....ins.	1, 1 1/4, 1 1/2, 2	1 1/4, 1 1/2, 2	1 1/2, 2, 2 1/2	2, 2 1/2, 3, 4	2 1/2, 3, 4	3, 3 1/2, 4, 6	4, 4 1/2, 5, 5 1/2, 6
Price .....each	\$20.00	\$25.00	\$30.00	\$40.00	\$55.00	\$70.00	\$90.00
Inlet .....ins.	6	8	10	12	16	18	.....
Outlet .....ins.	6, 8	8, 10	10	12	16	18	.....
Price .....each	\$150.00	\$225.00	\$325.00	\$450.00	\$650.00	\$900.00	.....



FIG. 3878



FIG. 3879



FIG. 3880

HOUSE SERVICE REGULATORS

Inlet Pressure.....pounds	100 to 500		10 to 100	
Inlet .....inches	1	1 1/4	1	1 1/4
Outlet .....inches	1, 1 1/4, 1 1/2, 2	1 1/4, 1 1/2, 2	1, 1 1/4, 1 1/2, 2	1 1/4, 1 1/2, 2
Price .....each	\$20.00	\$25.00	\$20.00	\$30.00

LOW PRESSURE SPRING REGULATOR

Inlet .....inches	3/4	1	1 1/4	1 1/2
Outlet .....inches	3/4	1	1 1/4	1 1/2
Price .....each	\$9.00	\$10.00	\$12.00	\$15.00

BOILER GOVERNOR

Size .....inches	1	1 1/4	1 1/2	2	2 1/2	3	4	6	8	10	12
Price .....each	\$18.00	\$23.00	\$28.00	\$40.00	\$48.00	\$55.00	\$75.00	\$110.00	\$165.00	\$250.00	\$375.00

FULTON GAS REGULATORS



DEAD WEIGHT REG.

FIG. 3881



DUPLEX REGULATOR

FIG. 3882



LITTLE HERCULES

FIG. 3883

DEAD WEIGHT REGULATOR

Size, in..	1	1 1/4	1 1/2	2	2 1/2	3	4	6	8
Price, each..	\$16.00	\$20.00	\$24.00	\$30.00	\$40.00	\$52.00	\$66.00	\$120.00	\$180.00

DUPLEX HIGH PRESSURE REGULATOR

Inlet in.	2	2 1/2	3	4	6	8	10	12	16	18	20
Outlet in.	2 or 3	2 1/2 or 3	3 or 4	4 or 6	6 or 8	8 or 10	10	12	16	18	20
Price each	\$55.00	70.00	95.00	115.00	185.00	260.00	370.00	490.00	750.00	\$1,100	\$1,400

LITTLE HERCULES HIGH PRESSURE REGULATOR

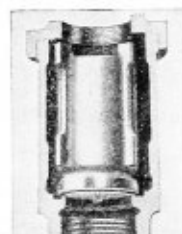
Will reduce 1,000 lbs. to 25 lbs. Has both 1/2 and 1-inch connections.

Priceeach \$10.00



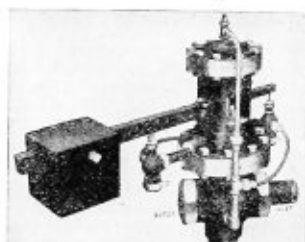
H. P. SPRING REG.

FIG. 3884



D. W. SAFETY VALVE

FIG. 3885



GAS RELIEF VALVE

FIG. 3886

HIGH PRESSURE SPRING REGULATOR

1-inch Inlet and 1-in. Outlet....\$16.00 1 1/4-in. Inlet and 1 1/4-in. Outlet....\$20.00

DEAD WEIGHT SAFETY VALVE

Pipe size, set to service required, in.	3/8	1/2	2	3	4	6
Price .....each	\$1.50	\$2.00	\$8.00	\$22.00	\$30.00	\$50.00

GAS RELIEF VALVE
For Natural Gas Gasoline Plants.

Inlet	inches	1 1/2x2	2x2	2x2 1/2	2 1/2x2 1/2	2 1/2x3	3x3
Outlet	inches	2	2	2 1/2	2 1/2	3	3
Price	each	\$67.00	\$67.00	\$92.00	\$92.00	\$117.00	\$117.00

THE CRAWFORD SENSITIVE REGULATOR

FOR GAS ENGINES, STREET MAINS,
INDUSTRIAL WORK, ETC.



FIG. 3837

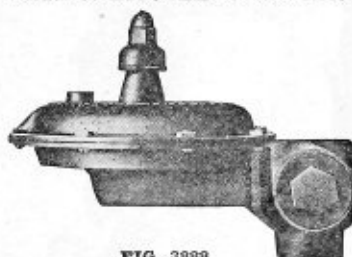
For over 15 years the Crawford Sensitive Regulator has been the "Acme" of Sensitive Regulators. It is safe; simple in construction; easy to adjust to any desired pressure without shutting off the gas; it is very sensitive, being free from stuffing boxes, bearings, fulcrums; needs no mercury and has no levers. The valve opening is full size of inlet pipe and connections are horizontal in line.

The adaptability of this regulator covers a large field; its use for Gas Engine work is today practically a standard in both the Artificial and Natural Gas Fields; and there are today thousands in use for this work giving the utmost satisfaction. As a regulator where close and sensitive regulation is necessary such as Incandescent Lighting, Industrial Fuel Installations, Linotype Machines, Gas Ranges, etc., its field is unlimited.

The Crawford Sensitive Regulator $\frac{3}{4}$ in. to 3 in. is built with two types of adjustment, the Compression Spring adjustment for ordinary work, or the "Dead Weight" adjustment which will give a finer and more sensitive regulation.

Regulators 4 in. and larger have "Dead Weight" adjustment only.

Size	Connections	Capacity at 4" Inlet Pres. 5/16" Outlet. Cubic Ft.	Capacity at 8" Inlet 3" Outlet. Cubic Ft.	Shipping Weight Lbs.	List Price	Extra for Counterspring
$\frac{3}{4}$	Screwed	360	585	12	\$ 12.50	\$.60
1	Screwed	535	865	40	16.00	.75
1 $\frac{1}{4}$	Screwed	720	1,170	43	17.50	.75
1 $\frac{1}{2}$	Screwed	1,200	2,795	44	18.00	.85
2	Screwed	4,400	7,148	58	21.00	.95
2 $\frac{1}{2}$	Screwed	5,700	9,360	60	30.00	1.10
3	Screwed	11,360	18,472	84	50.00	2.00
4	Flanged	16,000	27,000	195	100.00	3.00
6	Flanged	41,600	67,600	450	160.00	4.00
8	Flanged	66,000	107,000	600	220.00	5.00
10	Flanged	85,000	162,000	950	450.00	6.00
12	Flanged	100,000	250,000	1,200	600.00	8.00

"EMCO" SERVICE REGULATOR**"WITH REMOVABLE VALVE SEAT AND DISC AND ADJUSTABLE STEM"****FIG. 3888**

Designed for service work, either high or low pressure, artificial or natural gas. Furnished with or without mercury seal.

Maintains a constant outlet pressure.

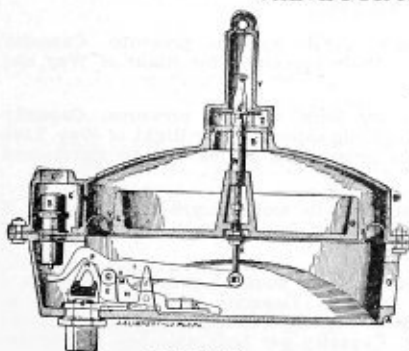
Outlet pressure can be changed instantly while in service and without shutting off the gas.

Will reduce 100 pounds or less inlet pressure to 2 in. of water or up.

Size Inlet and Outlet, Inches	List Price	Measurement Overall Inches	Capacity 8" Inlet 3" Water Outlet Cubic Ft.	Shipping Weight lbs.
$\frac{3}{4}$	\$ 7.00	$10\frac{1}{2}$	500	$11\frac{1}{4}$
1	7.00	$10\frac{1}{2}$	535	$11\frac{1}{4}$
$1\frac{1}{4}$	14.00	$16\frac{1}{4}$	750	$28\frac{1}{2}$
$1\frac{1}{2}$	15.00	$16\frac{1}{4}$	1,860	$28\frac{1}{2}$
2	36.00	$21\frac{3}{4}$	4,200	59

All Service Regulators are set to give a delivery pressure of 4 in. of water unless otherwise specified.

$\frac{3}{4}$ in. and 1 in. Service Regulators can be furnished with mercury seals, which adds 25 cents to list.

YOUNG'S FUEL REGULATOR**AUTOMATIC CUT-OFF AND DEAD-WEIGHT SAFETY VALVE FOR NATURAL GAS****FIG. 3889**

This Regulator and Cut-off is designed expressly for supplying Natural Gas to dwelling houses for both fuel and illuminating purposes, and is guaranteed to be a perfect regulator. It will deliver the gas at the same pressure, be the amount large or small. A perfect stop-off; it will automatically close the inlet valve when the pressure in the main ceases, and remain closed until readjusted. Perfectly safe; in case of breakage or failure of any of the parts from any cause, the large dead-weight safety valve will open and relieve all pressure from service lines.

Both sizes are set to deliver gas at about 2-ounce pressure, which is enough for all ordinary houses, but where a heavier pressure is desired we can furnish cast-iron weights to make about

8 ounces or more, if required, although we advise in all cases the use of as low a pressure as will do the work properly.

When you order give the ordinary pressure in your main line, about what variation it is subject to, and at what pressure you want the gas delivered.

Size "A."—To reduce from 50 pounds or less to two ounces.....Price, \$25.00
Size "B."—To reduce from 100 pounds or less to two ounces.....Price, 25.00

INLET in both sizes for 1-inch pipe, outlet for $1\frac{1}{2}$ -inch pipe.

Both sizes are set to deliver gas at about 2 ounce pressure.

"EMCO" GAS METERS



FIG. 3890

The "ACME" of Gas Meters. For Artificial or Natural Gas.

No. 0 Standard	180 cubic feet per hour, 1	-in. Connections
No. 0 High Pressure	180 cubic feet per hour, 1	-in. Connections
No. 1 Standard	250 cubic feet per hour, 1½	-in. Connections
No. 2 Standard	375 cubic feet per hour, 1½	-in. Connections
No. 2 High Pressure	375 cubic feet per hour, 1½	-in. Connections
No. 2½ Standard	900 cubic feet per hour, 2	-in. Connections
No. 3 Standard	1,100 cubic feet per hour, 3	-in. Connections
No. 3 High Pressure	1,100 cubic feet per hour, 3	-in. Connections
No. 4 Standard	2,500 cubic feet per hour, 4	-in. Connections
No. 4 High Pressure	2,500 cubic feet per hour, 4	-in. Connections
No. 4 Extra H. P.	2,500 cubic feet per hour, 4	-in. Connections

(All capacities are at ½-in. absorption, Water.)

No. 0 "EMCO" High Pressure will withstand 50-lb. working pressure, and at this pressure gas being corrected to 4 ozs. will pass.

No. 0 "EMCO" High Pressure Meter for 50-lb. working pressure. Capacity per hour at 4 ozs. at 50-lb. 1,435 cubic ft. (Made especially for Right of Way and Line Consumers.)

No. 2 "EMCO" High Pressure Meter for 50-lb. working pressure. Capacity per hour at 4 ozs. at 50-lb. 3,125 cubic feet. (Made especially for Right of Way, Line Consumers and Drilling Outfits, where the pressure of 50 lbs. can be maintained on the inlet of the meter.)

No. 3 "EMCO" Standard Meter will stand 50-lb. working pressure. The No. 3 High Pressure will stand 100-lb. working pressure. Capacity per hour at 4 ozs. at 100 lbs. 15,333 cubic feet.

No. 4 "EMCO" Standard Meter will stand 50-lb. working pressure. The No. 4 High Pressure will stand 100-lb. working pressure. Capacity per hour at 4 ozs. at 100 lbs. 34,500 cubic feet. The No. 4 "EMCO" Meter Extra Heavy High Pressure will stand a working pressure of 500 lbs. Capacity per hour at 4 ozs. at 500 lbs. 86,083 cubic feet.

The No. 3 Standard Meter is excellent for drilling wells, where a pressure of less than 50 lbs. down to 15 pounds can be maintained, also for small wells with low pressure. For small wells with pressure of 100 lbs. or less the No. 3 High Pressure is excellent.

The No. 4 Standard Meter is excellent for drilling wells, where a pressure of less than 15 lbs. is maintained.

Prices on application.

WYLIE IMPROVED PROPORTIONAL METERS

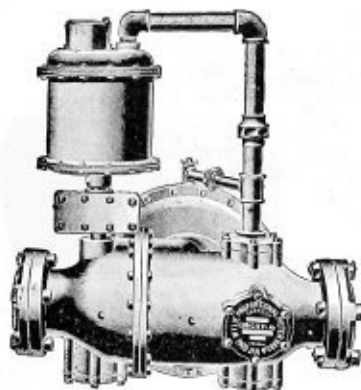


FIG. 3891

NOTE.—Wylie Improved Proportional Meters will measure gas accurately at any volume or pressure up to their rated capacity and pressure.

WYLIE IMPROVED PROPORTIONAL
3' METERS

50-Pound Test

2,000 ft. 3-inch flanges.....	\$120.00
3,000 ft. 3-inch flanges.....	150.00
4,000 ft. 3-inch flanges.....	190.00
5,000 ft. 3-inch flanges.....	220.00

500-Pound Test

2,000 ft. 3-inch flanges.....	\$200.00
3,000 ft. 3-inch flanges.....	225.00
4,000 ft. 3-inch flanges.....	275.00
5,000 ft. 3-inch flanges.....	350.00

Price for Pressure under 50 Pounds		Under 100 Pounds	Under 500 Pounds
No. 1			
5,000 cubic ft. per hr. capacity, 4-in. flanges,	\$ 220.00	No. 1 \$ 335.00	No. 1 \$ 350.00
6,000 cubic ft. per hr. capacity, 4-in. flanges,	235.00	No. 1 350.00	No. 1 380.00
8,000 cubic ft. per hr. capacity, 4-in. flanges,	250.00	No. 1 380.00	No. 1 400.00
10,000 cubic ft. per hr. capacity, 4-in. flanges,	265.00	No. 1 400.00	No. 1 425.00
15,000 cubic ft. per hr. capacity, 4-in. flanges,	280.00	No. 1 425.00	No. 1 465.00
No. 2			
20,000 cubic ft. per hr. capacity, 6-in. flanges,	\$ 330.00	No. 2 \$ 510.00	No. 2 \$ 555.00
25,000 cubic ft. per hr. capacity, 6-in. flanges,	350.00	No. 2 555.00	No. 2 600.00
30,000 cubic ft. per hr. capacity, 6-in. flanges,	400.00	No. 2 650.00	No. 2 695.00
40,000 cubic ft. per hr. capacity, 6-in. flanges,	500.00	No. 2 740.00	No. 2 785.00
50,000 cubic ft. per hr. capacity, 6-in. flanges,	600.00	No. 2 835.00	No. 2 880.00
No. 3			
60,000 cubic ft. per hr. capacity, 8-in. flanges,	\$ 700.00		
75,000 cubic ft. per hr. capacity, 8-in. flanges,	800.00		
No. 4			
75,000 cubic ft. per hr. capacity, 12-in. flanges,	.....	No. 4 \$1480.00	No. 4 \$1665.00
100,000 cubic ft. per hr. capacity, 12-in. flanges,	1000.00	No. 4 1850.00	No. 4 2220.00
125,000 cubic ft. per hr. capacity, 12-in. flanges,	1200.00	No. 4 2040.00	No. 4 2590.00
150,000 cubic ft. per hr. capacity, 12-in. flanges,	1500.00	No. 4 2220.00	No. 4 2780.00
200,000 cubic ft. per hr. capacity, 12-in. flanges,	1300.00		No. 4 3335.00

U. S. G. CO'S. MOTOR AND GENERATOR BRUSHES

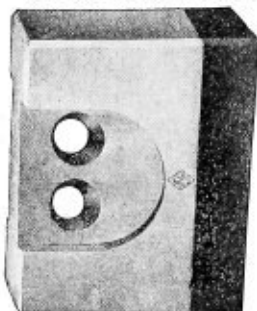


FIG. 3892

Composed of pure Mexican Graphitic Carbon, compounded with other low resistance carbons, these brushes are made in a number of different varieties and the composition of each variety is adjusted in the

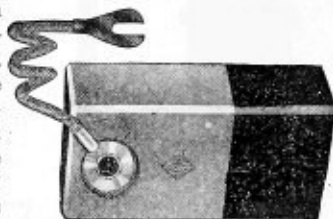


FIG. 3893

course of manufacture to suit any known condition to which the brush may be subjected under operating conditions.

U. S. G. Brushes are so thoroughly impregnated with the lubricating qualities of the graphite used in their composition that they not only minimize the electrical power losses ordinarily occurring during commutation, but accomplish this without undue wear on the brush itself or on the copper.

Each type of brush is especially designed for the service in which it is to operate and upon receipt of data concerning the machine and service we are able to recommend the grade of brush which is guaranteed to fulfill requirements satisfactorily.

The following is an outline of the characteristics of our brushes for the various types of service as required by the different users.

For D. C. Industrial Motors, Elevator and Crane Motors, small Industrial Motors, Mill Motors in Steel Mills, etc., we offer a number of grades for both slotted and unslotted commutator, all of which are self lubricating and give good quiet running with exceptionally light wear on the commutator. A wide range of hardness and electrical resistance to meet all conditions.

For slip ring Induction Motors and A. C. Generators we have a variety of brushes of pure graphite and metal graphite composition having carrying capacities ranging from 35 to 150 amperes per square inch. The specially selected graphite these brushes contain reduces friction and prolongs the life of the rings.

For Electric Railway Motors, Dynamotors, Air Compressors, we offer a hard, dense type of brush featuring clean commutation, long life and requiring but little labor attention. Particularly recommended for non-interpole and interpole machines of medium and high speeds.

For small Industrial Motors we have a variety of fairly hard brushes of high carrying capacity, designed to withstand severe service without chipping, breaking, heating or producing undue wear on the commutator. Made in varying textures and adapted for use on slotted or unslotted commutators.

These brushes are furnished with any standard type of pigtail connection and if desired we can furnish connections of special design.

Prices upon application.

AMERICORE LAMP CORD AND REINFORCED CORD

N. E. CODE STANDARD



FIG. 3894

American Wire Gauge (B. & S.)	No. Wires	Diam. Rubber, Inches	Twisted Pair (Type C)				Duplex Parallel (Type P. O.)			
			Cotton Covered		Silk Covered		Cotton Covered		Silk Covered	
			List No.	Wt.	List No.	Wt.	List No.	Wt.	List No.	Wt.
10	104	3-64	1100	122.00	1120	116.71	1400	120.0	1420	117.0
12	65	3-64	1102	89.36	1122	84.77	1402	88.9	1422	86.1
14	41	3-64	1104	65.49	1124	61.53	1404	66.1	1424	63.6
16	26	1-32	1106	37.70	1126	34.61	1406	38.7	1426	36.8
18	16	1-32	1108	29.33	1128	26.47	1408	30.2	1428	28.5
20	10	1-32	1110	23.44	1130	20.83	1410	24.5	1430	22.9
22	6	1-32	1112	20.15	1132	17.50	1412	20.9	1432	19.3

SOLID TINNED COPPER CONDUCTOR

FOR LOW POTENTIAL—0-600 VOLTS

N. E. CODE STANDARD



FIG. 3895

American Wire Gauge (B. & S.)	Megohms per Mile after 12 Hours Immersion	Thickness of Rubber Inches	Approx. Diam. Over		List Numbers			Stand. Pkgs. Approx. Quantities Ft.
			Single Braid Inches	Double Braid Inches	Sin. Braid Bk. Finish Type Letter R. S.	Sin. Braid, W'te Fin. Type Letter R. S.	D'ble Braid Bk. Finish Type Letter R. D.	
0000	.100	5-64	44-64	47-64	810C	830C	850C	1000
000	.100	5-64	40-64	43-64	810B	830B	850B	1000
00	.125	5-64	37-64	40-64	810A	830A	850A	1000
0	.125	5-64	34-64	37-64	810	830	850	1000
1	.150	5-64	32-64	35-64	811	831	851	1000
2	.125	4-64	28-64	31-64	812	832	852	1000
3	....	4-64	26-64	29-64	813	833	853	1000
4	.150	4-64	24-64	27-64	814	834	854	1000
5	....	4-64	23-64	26-64	815	835	855	1000
6	.200	4-64	21-64	24-64	816	836	856	500
8	.200	3-64	17-64	20-64	818	838	858	500
10	.225	3-64	15-64	18-64	820	840	860	500
12	.250	3-64	14-64	17-64	822	842	862	500
14	.300	3-64	13-64	16-64	824	844	864	500
16	....	2-64	10-64	13-64	826	846	866	500
18	....	2-64	9-64	12-64	828	848	868	500

SPECIFICATIONS: Solid tinned annealed copper wire of highest conductivity, insulated with code thickness of high grade vulcanized rubber, protected with one or two smooth, closely woven, strong and elastic cotton braids, saturated in black weatherproof compound for outside, or white for inside use; special finish for unlined conduit work.

AMERICORE FLEXIBLE CABLES
FLEXIBLE TINNED COPPER CONDUCTOR, BLACK FINISH
N. E. CODE STANDARD

**FIG. 3896**

FOR LOW POTENTIAL, 0-600 VOLTS

American Wire Gage (D. & S.)	Number and Diam. of Wires in Strand Inches	Thick-ness of Rubber Inches	Approx. Diam. Over		List Number		Standard Packages Approximate Quantities Feet
			Single Braid Inches Type Letter R. S.	Double Braid Inches Type Letter R. D.	Single Braid	Double Braid	
1	259 x .018	5-64	37-64	40-64	221	271	1000
2	210 x .018	4-64	33-64	36-64	222	272	1000
3	151 x .018	4-64	30-64	33-64	223	273	1000
4	133 x .018	4-64	27-64	30-64	224	274	1000
6	82 x .018	4-64	23-64	26-64	226	276	1000
6	49 x .023	4-64	23-64	26-64	226A	276A	1000
8	49 x .0184	3-64	19-64	22-64	228	278	500
9	40 x .018	3-64	18-64	21-64	229	279	500
10	19 x .0234	3-64	17-64	20-64	230	280	500
12	19 x .0185	3-64	15-64	18-64	232	282	500
14	19 x .0147	3-64	14-64	17-64	234	284	500

SPECIFICATIONS: Tinned annealed extra flexible strand of highest conductivity, insulated with code thickness of high grade vulcanized rubber, protected with one or two smooth closely woven cotton braids, saturated in black weatherproof compound and smoothly finished. The above are for switchboard, brush holder and similar connections where very flexible cables are required.

**FIG. 3897**

NON-METALLIC FLEXIBLE CONDUITS
CIRCULAR LOOM

Hole $\frac{1}{4}$ inch	per foot, \$0.06
Hole $\frac{3}{8}$ inch	per foot, .09
Hole $\frac{1}{2}$ inch	per foot, .12
Hole $\frac{5}{8}$ inch	per foot, .15
Hole $\frac{3}{4}$ inch	per foot, .18
Hole 1 inch	per foot, .25
Hole $1\frac{1}{4}$ inch	per foot, .33
Hole $1\frac{1}{2}$ inch	per foot, .40
Hole $1\frac{3}{4}$ inch	per foot, .47

TESTED FUSE WIRES

**FIG. 3898**

Safe Carrying Capacity Amperes	Best Lengths for Use and Fusing Currents for such Lengths		Length Per Lb. Ft. In.	Mils. Diam.	Price Per Lb.
	Inches	Amperes			
3	$1\frac{1}{2}$	7	265	31	\$1.00
5	$1\frac{3}{4}$	10	167	39	1.00
10	$2\frac{1}{4}$	17	84	55	.80
15	$2\frac{1}{4}$	24	55	68	.75
25	$2\frac{3}{4}$	37	28.9	82	.75
30	$2\frac{3}{4}$	43	24	94	.75

"FLEXSTEEL" METALLIC FLEXIBLE CONDUIT**FIG. 3899**

List No.	Nominal Inside Diam., Inches	List Price 100 Feet	Approx. Feet in Coil	Weight per 1000 Feet Pounds
11676	$\frac{3}{8}$	\$ 5.00	250	203
11677	$\frac{7}{8}$	7.50	250	356
11678	$\frac{1}{2}$	10.00	100	590
11679	$\frac{3}{4}$	13.00	50	820
11680	1	21.00	50	1,260
11681	$1\frac{1}{4}$	26.00	50	1,680
11682	$1\frac{1}{2}$	35.00	25-50	2,000
11683	2	45.00	25-50	2,335
11684	$2\frac{1}{2}$	52.00	25-50	3,000

Single Pole

**FIG. 3900****PERKINS 125-250 VOLT
SURFACE SWITCHES**

National Electric Code Standard

Double Pole

**FIG. 3901****SINGLE POLE-5 AMPERES, 125 VOLTS-73 AMPERES, 250 VOLTS**

No.	List Price	Standard Package	Description	Weight Package, Lbs.	Carton
2000	\$0.28	250	Slotted	75	10
A2220	.28	250	Solid	75	10
2047	.32	250	Slotted, Indicating	75	10
A2035	.32	250	Solid, Indicating	75	10

SINGLE POLE-10 AMPERES, 125 VOLTS-5 AMPERES, 250 VOLTS

2001	\$0.48	100	Slotted	45	10
B2221	.48	100	Solid	45	10
2048	.54	100	Slotted, Indicating	45	10
B2036	.54	100	Solid, Indicating	45	10

DOUBLE POLE-5 AMPERES, 250 VOLTS

C2391	\$0.56	100	Solid	30	10
C2392	.56	100	Slotted	30	10
C2393	.64	100	Solid, Indicating	30	10
2394	.64	100	Slotted, Indicating	30	10

DOUBLE POLE-10 AMPERES, 250 VOLTS

D2009	\$0.66	100	Solid	45	10
2017	.66	100	Slotted	45	10
D2038	.76	100	Solid, Indicating	45	10
2050	.76	100	Slotted, Indicating	45	10

A and D—These switches can be furnished with a $1\frac{3}{4}$ inch diameter base.B and C—These switches can be furnished with a $2\frac{1}{4}$ inch diameter base.

COMBINATION SWITCHES FOR PLUG FUSES, 30 AMPERE

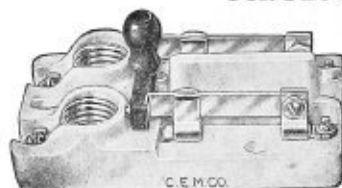


FIG. 3902

FOR WIRES ENTERING AT TOP

250 Volts.

No. 1503List price, each, \$1.00

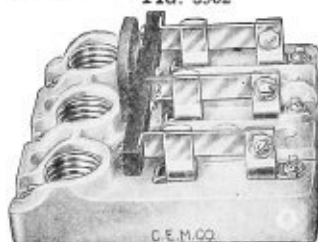
Size $6\frac{1}{4} \times 3\frac{3}{8}$ inches.

FIG. 3903

FOR WIRES ENTERING AT TOP

125-250 Volts.

No. 1504List price, each, \$1.40

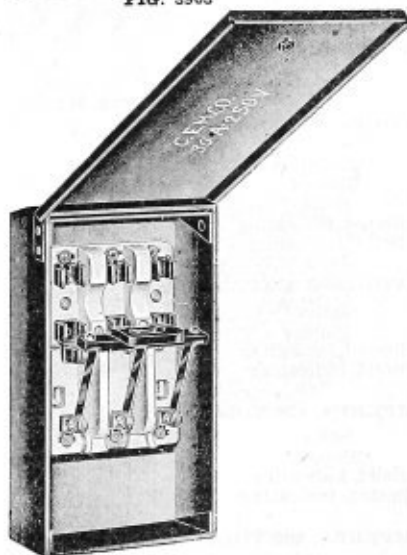
Size $5\frac{1}{2} \times 5$ inches.

FIG. 3904

SHEET STEEL SERVICE BOXES

Knockout Holes Placed as Desired
without Extra Cost.

This price includes switch mounted
in box. Bushings extra.

Made of No. 16 gauge steel.

For No. 14 add 25% to list.

SURFACE TYPE WITH NATIONAL ELECTRICAL CODE COMBINATIONS

No.	Amp.	Volts	Poles	Size	List Price each
18055	30	250	2	$9 \times 4\frac{1}{2} \times 3\frac{1}{2}$	\$3.35
18066	30	250	3	$11 \times 6 \times 3\frac{1}{2}$	4.00

TELEPHONE OR BATTERY SWITCHES

PORCELAIN BASE. 15 AMP.

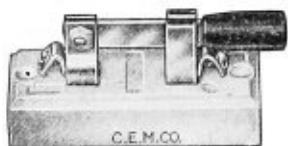


FIG. 3905

No. 1260. Size, $1\frac{1}{8} \times 3\frac{1}{8}$...List price each, \$0.20

INDICATING SNAP SWITCHES

FOR WOOD MOLDING

5 AMP. 125 VOLTS—3 AMP. 250 VOLTS



FIG. 3906

All snap switches have indicating keys.

Key operates in either direction fastened solidly to key shaft to prevent loss of same. Key on side of switch to prevent breakage. Single pole only.
No. 13000List price each, \$0.28

NEW CODE PORCELAIN BASE SWITCHES

125-250 VOLTS

15 Amp. No. 1401

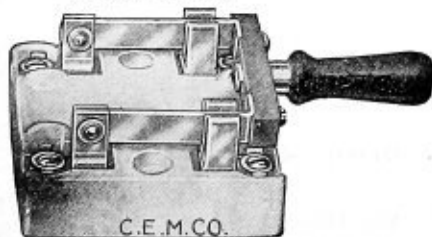


FIG. 3907

15 Amp. No. 1403

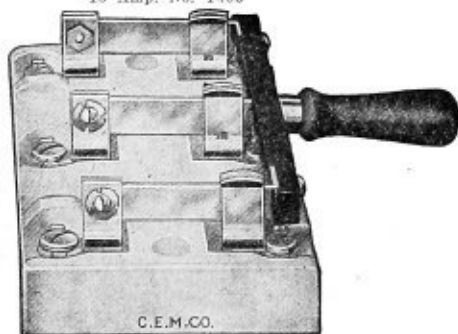


FIG. 3908

No.	Amp.	Volts		List Price Each
1402	15	250	D. P. S. T.	\$0.45
1403	15	250	3 P. S. T.	.75



FIG. 3909

INDICATING KEY SOCKETS

- No. 11050. $\frac{3}{8}$ inch Cap.....list price, each \$0.33
 No. 11051. $\frac{1}{4}$ inch Cap.....list price, each .39
 No. 11052. $\frac{3}{8}$ inch Cap.....list price, each .39

All sockets are shipped brush brass finish. No extra charge for polished brass. Add 4 cents to list on all other finishes.



FIG. 3910

SNAP CAP KEYLESS SOCKETS

660 WATTS, 250 VOLTS

Screw shell imbedded in socket base.

- No. 11060. $\frac{3}{8}$ inch Cap.....list price, each \$0.30
 No. 11061. $\frac{1}{4}$ inch Cap.....list price, each .36
 No. 11062. $\frac{3}{8}$ inch Cap.....list price, each .36

All keyless sockets are furnished in brush brass finish. No extra charge for polished brass.

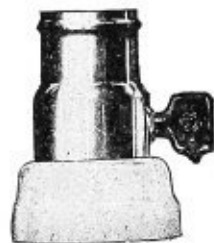


FIG. 3911

INDICATING KEY WALL SOCKETS

660 WATTS, 250 VOLTS

Quick Make and Quick Break.

- No. 12025.....list price, each \$0.44



FIG. 3912

WATERPROOF SOCKETS

COMPOSITION TYPE FOR SHADE HOLDER

600 VOLTS

- No. 60666.....list price, each \$0.22

Two-Screw



FIG. 3913

CLEAT RECEPTACLES

No. 50715list price, each \$0.15

Holes for supporting screws are $2\frac{1}{8}$ inch on centers."NON-BREAKABLE" FUSE PLUGS
MICA CAP

All sizes, 3 to 30 Ampere.



FIG. 3914

No. 6303.	3 Ampere.....	list price, each	\$0.07
No. 6306.	6 Ampere.....	list price, each	.07
No. 6310.	10 Ampere.....	list price, each	.07
No. 6312.	12 Ampere.....	list price, each	.07
No. 6315.	15 Ampere.....	list price, each	.07
No. 6320.	20 Ampere.....	list price, each	.07
No. 6325.	25 Ampere.....	list price, each	.07
No. 6330.	30 Ampere.....	list price, each	.07



FIG. 3915

SEPARABLE ATTACHMENT PLUG

Made in composition cap and porcelain base only.

660 WATTS, 250 VOLT

No. 1002list price \$0.25



FIG. 3916

MOLDED WEATHERPROOF
ATTACHMENT PLUG

No. 345-Blist price \$0.44

FUSELESS TWO-PIECE ROSETTES

Caps are interchangeable and will fit either type of base. 250 volts.

CLEAT TYPE FUSELESS

Cap

**FIG. 3917**

No. 2752, list price, each \$0.15

**FIG. 3918****FUSIBLE TWO-PIECE ROSETTES**

Caps are interchangeable and will fit either type of base. 125 volts.

CLEAT TYPE FUSED

Cap

**FIG. 3919**

No. 2762, list price, each \$0.15

**FIG. 3920****ROSETTES**

One-Piece Combination Cleat and concealed with $\frac{1}{2}$ inch Base.

**FIG. 3921**

No. 2696-B.....list price, each \$0.07

**FIG. 3922****POCKET VOLTMETER**

No. 1.	0 to 3 Volts in tenths.....	list price, each \$10.00
No. 2.	0 to 5 Volts in tenths.....	list price, each 11.00
No. 3.	0 to 10 Volts in tenths.....	list price, each 13.50
No. 4.	0 to 15 Volts in tenths.....	list price, each 16.50

EDISON PLUG CUT-OUTS



FIG. 3923

SINGLE POLE, MAIN

No. 2569List price each, \$0.18



FIG. 3924

DOUBLE POLE, MAIN

No. 2965List price each, \$0.30



FIG. 3925

DOUBLE POLE, SINGLE BRANCH

No. 1935List price each, \$0.32



FIG. 3926

THREE POLE, MAIN

No. 2165List price each, \$0.44

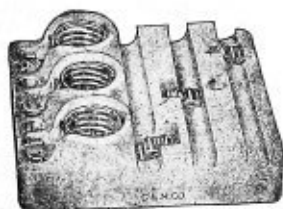


FIG. 3927

THREE POLE, SINGLE BRANCH

No. 8042List price each, \$0.54



FIG. 3923

QUEEN STANDARD PORTABLE VOLT-METERS AND AMMETERS

FOR DIRECT CURRENT

The instruments listed herein are of the permanent magnet type, moving coil system, for direct current only. They are the result of many years' experience in making the highest grade of Scientific and Testing Instruments and no pains have been spared to produce a line of meters which may be depended upon in the most accurate work. The individual parts have been carefully considered in their relation to each other and are perfect theoretically and mechanically. Accuracy of calibration $1/5$ of 1 per cent.

No.	Range in Volts	Readable To	Price	No.	Range in Volts	Readable To	Price
1	0-50	$1/30$ of a volt	\$52.50	9	0-5	$1/300$ of a volt	\$75.00
2	0-100	$1/10$ " " "	55.00	10	0-15	$1/100$ " " "	75.00
3	0-150	$1/10$ " " "	57.50	11	0-150	$1/10$ " " "	77.50
4	0-250	$1/5$ " " "	62.50	12	0-300	$1/5$ " " "	80.00
5	0-300	$1/2$ " " "	65.00	13	0-600	$1/2$ " " "	80.00
6	0-450	$1/2$ " " "	65.00	14	0-150	$1/100$ " " "	90.00
7	0-600	$1/2$ " " "	65.00		0-5	$1/100$ " " "	
8	0-750	$1/2$ " " "	70.00		0-15	$1/100$ " " "	
					0-150	$1/10$ " " "	

QUEEN PORTABLE STANDARD AMMETERS

These Instruments have self-contained Shunts and are of single ranges as listed. See next page for list of Shunts for ampere measurements for use with Portable Milli-Voltmeter.

No.	Range in Ampere	Readable To	Price	No.	Range in Ampere	Readable To	Price
15	5	$1/300$ of an Amp.	\$65.00	21	200	$1/2$ of an Amp.	\$80.00
16	15	$1/100$ " " "	65.00	22	250	$1/5$ " " "	80.00
17	25	$1/40$ " " "	65.00	23	300	$1/5$ " " "	80.00
18	50	$1/20$ " " "	65.00	24	400	$1/2$ " " "	90.00
19	100	$1/10$ " " "	70.00	25	500	$1/2$ " " "	90.00
20	150	$1/10$ " " "	75.00				

QUEEN STANDARD PORTABLE MILLI-VOLTMETER WITH SHUNTS FOR AMPERE MEASUREMENTS

Queen Standard Portable Millivoltmeter. Price \$50.00.

SHUNTS FOR AMPERE MEASUREMENTS

Single Range Shunts			Double Shunts In One Case			3 Range Shunts In One Case		
No.	Range in Amperes	Price	No.	Range In Amperes	Price	No.	Range In Amperes	Price
26	1	\$10.00	43	1 and 5	\$20.00	60	1.5-3-15	\$30.00
27	3	12.50	44	1 and 10	22.50	61	1.5-5-15	30.00
28	5	15.00	45	1.5 and 15	25.00	62	1.5-5-30	30.00
29	10	15.00	46	3 and 15	25.00	63	3-15-30	35.00
30	15	15.00	47	3 and 30	25.00	64	5-15-50	37.50
31	25	17.50	48	5 and 50	30.00	65	1.5-5-50	40.00
32	30	20.00	49	15 and 75	35.00	66	1.5-5-75	42.50
33	50	22.50	50	30 and 150	45.00	67	1.5-15-150	50.00
34	75	25.00	51	20 and 200	47.50	68	3-15-150	52.50
35	100	30.00	52	15 and 300	52.50	69	5-15-150	55.00
36	150	32.50	53	30 and 300	55.00	70	10-100-200	60.00
37	200	35.00	54	25 and 300	55.00	71	2-20-200	55.00
38	300	40.00	55	150 and 300	60.00	72	1.5-15-300	60.00
39	400	45.00	56	200 and 400	65.00	73	15-30-300	62.50
40	500	50.00	57	50 and 500	62.50	74	1.5-15-300	60.00
41	600	55.00	58	100 and 500	65.50	75	3-30-300	60.00
42	750	60.00	59	300 and 750	90.00	76	15-75-300	65.00

QUEEN VOLT - WATTMETER OR LAMP TESTING METER

Queen Volt-Wattmeter



FIG. 3929

Indispensable to All Users of Incandescent Lamps.

This instrument is an entirely new type of volt-wattmeter, and one which will be extremely valuable to all electricians, testing engineers, lamp salesmen, and any one interested in the testing of line voltages and low wattages. There are but two binding posts, and in ordinary use it reads as a voltmeter. Flush on the side is a lamp socket into which can be screwed an incandescent lamp or an attachment plug and automatically change instrument from a voltmeter to a wattmeter, so that the instrument is then reading directly on the wattage scale.

Thus it can be readily seen that this meter comprises two instruments in one, each scale being separate and direct reading without interpolation or reference to a chart. It is to be noted that this voltmeter has a dynamometer system and consequently is available for direct and alternating circuits, thereby offering a testing instrument with a wide range of measurement.

Accuracy of Calibration, 1 per cent.

Mfr. No.	Range	Price, Each
E-8500	150 v. 150 watts AC & DC	\$30.00
E-8505	250 v. 250 watts AC & DC	32.00
E-8510	300 v. 300 watts AC & DC	35.00

ECONOMY RENEWABLE FUSES AND LINKS

N. E. CODE STANDARD—250 VOLTS

Ferrule Type Fuses

Ferrule Type Links



FIG. 3930



FIG. 3931

3-30 Amperes—100 in Package

Capacity .....amperes	3	4	5	6	8	10	12	15	20	25	30
Fuses .....each	\$0.50	.50	.50	.50	.50	.50	.50	.50	.50	.50	.50
Links .....each	.03	.03	.03	.03	.03	.03	.03	.03	.03	.03	.03

Length Fuses—Above sizes, 2 inches

31-60 Amperes—100 in Package

Capacity .....amperes	35	40	45	50	55	60
Fuses .....each	\$1.00	1.00	1.00	1.00	1.00	1.00
Links "	.05	.05	.05	.05	.05	.05

Length Fuses—Above sizes, 3 inches

Knife Blade Fuses

Knife Blade Links



FIG. 3932



FIG. 3933

60-100 Amperes—50 in Package

Capacity .....amperes	65	70	75	80	85	90	95	100
Fuses .....each	\$2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Links "	.10	.10	.10	.10	.10	.10	.10	.10

Length Fuses—Above sizes, 5½ inches

101-200 Amperes—25 in Package

Capacity .....amperes	110	120	125	150	175	200
Fuses .....each	\$4.00	4.00	4.00	4.00	4.00	4.00
Links "	.15	.15	.15	.15	.15	.15

Length Fuses—Above sizes, 7½ inches

201-400 Amperes—25 in Package

Capacity .....amperes	225	250	275	300	325	350	375	400
Fuses .....each	\$7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50
Links "	.30	.30	.30	.30	.30	.30	.30	.30

Length Fuses—Above sizes, 8½ inches

401-600 Amperes—25 in Package

Capacity .....amperes	450	500	550	600
Fuses .....each	\$11.00	11.00	11.00	11.00
Links "	.60	.60	.60	.60

Length Fuses—Above sizes, 10½ inches

ECONOMY RENEWABLE FUSES AND LINKS— CONTINUED

N. E. CODE STANDARD—600 VOLTS

Ferrule Type Fuses



FIG. 3934

Ferrule Type Links



FIG. 3935

3-30 Amperes—100 in Packages

Capacity .....amperes	3	4	5	6	8	10	12	15	20	25	30
Fuses .....each	\$1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
Links "	.05	.05	.05	.05	.05	.05	.05	.05	.05	.05	.05

Length Fuses—Above sizes, 5 inches

31-60 Amperes—100 in Package

Capacity .....amperes	35	40	45	50	55	60
Fuses .....each	\$1.25	1.25	1.25	1.25	1.25	1.25
Links "	.06	.06	.06	.06	.06	.06

Length Fuses—Above sizes, 5½ inches

Knife Blade Fuses



FIG. 3936

Knife Blade Links



FIG. 3937

60-100 Amperes—50 in Package

Capacity .....amperes	65	70	75	80	85	90	95	100
Fuses .....each	\$3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Links "	.10	.10	.10	.10	.10	.10	.10	.10

Length Fuses—Above sizes, 7¾ inches

101-200 Amperes—25 in Package

Capacity .....amperes	110	120	125	150	175	200
Fuses .....each	\$5.00	5.00	5.00	5.00	5.00	5.00
Links "	.15	.15	.15	.15	.15	.15

Length Fuses—Above sizes, 9¾ inches

201-400 Amperes—25 in Package

Capacity .....amperes	225	250	275	300	325	350	375	400
Fuses .....each	\$11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00
Links "	.30	.30	.30	.30	.30	.30	.30	.30

Length Fuses—Above sizes, 11¾ inches

401-600 Amperes—25 in Package

Capacity .....amperes	450	500	550	600
Fuses .....each	\$16.00	16.00	16.00	16.00
Links "	.60	.60	.60	.60

Length Fuses—Above sizes, 13¾ inches

LAMP GUARDS

Loxon

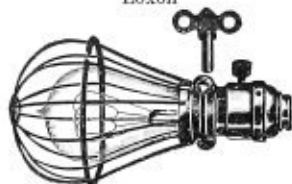


FIG. 3938

Crescent Portable



FIG. 3939

LOXON LAMP GUARDS

	Mazda	Volt	Socket	List Price Per Dozen
No. 1423.....	15 Watt	...	Std.	\$6.00
No. *1424A.....	15 Watt	...	W. P.	6.00
No. *1424B.....	15 Watt	...	W. P.	6.00
No. 1425.....	25- 60 Watt	110	Std.	6.00
No. 1426.....	40- 60 Watt	220	Std.	6.30
No. *1427A.....	25- 60 Watt	110	W. P.	6.00
No. *1427B.....	25- 60 Watt	110	W. P.	6.00
No. *1428A.....	40- 60 Watt	220	W. P.	6.30
No. *1428B.....	40- 60 Watt	220	W. P.	6.30
No. 2444.....	100 Watt	...	Std.	10.00
No. *2446A.....	100 Watt	...	W. P.	10.00
No. *2446B.....	100 Watt	...	W. P.	10.00
No. 2447.....	200 Watt	...	Std.	12.50

* The letter "A" or "B" following the catalog number merely refers to the different diameters of the sockets.

Loxon Guards are made to fit Crouse Hinds Condulet Receptacles when so specified. Loxon Guards are made to fit V. V. Receptacles when so specified. Loxon Guards are made to fit Appleton Electric Co. Unilets when so specified. Loxon Guards are made to fit Benjamin Electric Aluminum Sockets when so specified. Loxon Guards are made to fit General Electric Aluminum Sockets when so specified.

All numbers followed by "A" fit the following sockets:

Bryant No. 9366 Porcelain.	Freeman No. 132 Porcelain.
Bryant No. 9448 Porcelain.	Freeman No. 155 Porcelain.
Bryant No. 9395 Porcelain.	Freeman No. 320 Porcelain.
Bryant No. 43310 Mica.	P. & S. No. 60217 Porcelain.
Paiste No. 9366 Porcelain.	P. & S. No. 116 Porcelain.
Gen. Elec. No. 9366 Porcelain.	Siemens No. 43310 Composition.
Gen. Elec. No. 60666 Comp. New Style.	

All numbers followed by "B" fit the following sockets:

Bryant No. 60666 Composition.	Freeman No. 160 Porcelain.
Gen. Elec. No. 60666 Old Style.	H. W. J. M. No. 60666 Rubber.
Paiste No. 60666 Composition.	H. W. J. M. No. 1149 Mica or Comp.
P. & S. No. 60666 Composition.	Siemens No. 60666 Composition.

One key with every dozen guards. Extra keys, each 5 cents net.

In ordering for Weatherproof Sockets not mentioned above, specify maker's name and catalog number.

CRESCENT PORTABLE LAMP GUARDS

A light but very strong and convenient portable built to withstand hard usage, which can be recommended to give unusual service. Takes any $\frac{3}{8}$ -inch standard brass socket, but is furnished without socket.

No. 4645—For 40-Watt Lamp.....	each	\$2.50
No. 4676—For 60-Watt Lamp.....	"	2.50

FRANKLIN MAZDA LAMPS



FIG. 3940



FIG. 3941

LARGE STYLE—STRAIGHT SIDE AND PEAR SHAPE TYPES

October 1, 1918

Volts	Size of Lamp, Watts	Watts per Cubical C.F.	Type and Size Bulb	Diam. Bulb, Inches	Max. Over. All Length, Inches	Base Regularly Supplied	Standard Package Quantity	LIST PRICE	
								Clear	Prosted
110 to 125	10	1.67	S-17	2 1/8	4 5/8	Med. Screw	100	\$0.35	\$0.38
	15	1.47	S-17	2 1/8	4 5/8	Med. Screw	100	.35	.38
	25	1.37	S-19	2 3/8	5 1/4	Med. Screw	100	.35	.38
	40	1.33	S-19	2 3/8	5 1/4	Med. Screw	100	.35	.38
	50	1.32	S-19	2 3/8	5 1/4	Med. Screw	100	.35	.38
	60	1.29	S-21	2 5/8	5 1/2	Med. Screw	100	.40	.45
220 to 250	100	1.24	S-30	3 3/8	7 7/8	Med. se. sk.	24	.85	.92
	25	1.65	S-19	2 3/8	5 1/4	Med. Screw	100	.40	.43
	50	1.49	S-19	2 3/8	5 1/4	Med. Screw	100	.40	.43
	100	1.39	S-30	3 3/8	7 7/8	Med. se. sk.	24	1.00	1.07
	150	1.33	S-35	4 3/8	8 3/4	Med. se. sk.	24	1.50	1.60
	250	1.20	S-40	5	10	Med. se. sk.	12	2.50	2.65
PEAR SHAPE (MAZDA C) NITROGEN									
110 to 125	75	1.09	PS-22	2 3/4	6 1/8	Med. screw	50	\$0.70	\$0.75
	100	1.00	PS-25	3 1/8	7 1/8	Med. screw	24	1.10	1.15
	150	0.92	PS-25	3 1/8	7 1/8	Med. screw	24	1.65	1.70
	200	0.86	PS-30	3 3/8	8 3/8	Med. screw	24	2.20	2.27
	300	0.78	PS-35	4 3/8	9 3/4	† Mog. screw	24	3.25	3.35
	400	0.82	PS-40	5	10	Mog. screw	12	4.30	4.45
	500	0.78	PS-40	5	10	Mog. screw	12	4.70	4.85
	750	0.74	PS-52	6 1/2	13 3/8	Mog. screw	8	6.50	6.75
220 to 250	1000	0.70	PS-52	6 1/2	13 3/8	Mog. screw	8	7.50	7.75
	200	1.00	PS-30	3 3/4	8 3/8	Med. screw	24	2.40	2.47
	300	0.92	PS-35	4 3/8	9 3/4	Mog. screw	24	3.90	4.05
	400	0.86	PS-40	5	10	Mog. screw	12	5.10	5.20
	500	0.85	PS-40	5	10	Mog. screw	12	5.60	5.75
	750	0.82	PS-52	6 1/2	13 3/8	Mog. screw	8	7.70	7.95
	1000	0.78	PS-52	6 1/2	13 3/8	Mog. screw	8	9.00	9.25

†Orders for MAZDA C lamps should specifically state if lamps are for use in other than pendant position.

†Mogul Screw Base regularly supplied and recommended. Medium Screw Skirted Base (Style 100) can be supplied at same price when specially ordered, but is not recommended and attention is called to the fact that it is contrary to the Underwriters' Rules to use MAZDA C lamps of this wattage in Medium Screw Sockets. With the Medium Screw Skirted Base the maximum overall length of this lamp is 10 1/4 inches and the light center length is 7 1/2 inches.

Standard package discounts on all large style MAZDA lamps can be given only on orders for exact standard package quantities or multiples thereof. It is allowable, however, to combine in one standard package all sizes of large style MAZDA lamps having the same standard package quantity. Such lamps may be of different voltages and finish of bulb.

ELECTRIC LAMPS
REGULAR TYPE CARBON LAMPS

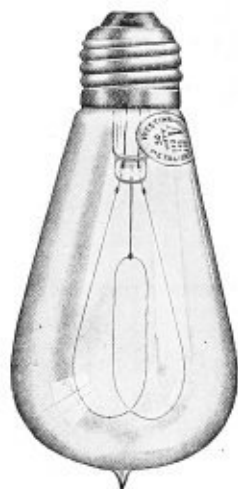


FIG. 3942

Carbon Lamp Price List Effective Nov. 12, 1917

CARBONS—LARGE

Volts	Candle Power	Watts	Bulbs	S. P. Q.	List Price	
					Clear	Frosted
100-130	8-16	30-60	G-18½	250	\$0.27	\$0.295
200-275	8-16	30-60	G-18½	250	.32	.345

TUBULAR BULB TYPE

Volts	Candle Power	Watts	Bulbs	S. P. Q.	Clear	Frosted
100-130	8-16	30-60	T-10	100	.32	.345
200-275	16	60	T-10	100	.44	.465

STRAIGHT SIDE

Volts	Candle Power	Watts	Bulbs	S. P. Q.	Clear	Frosted
100-130	32	120	S-24	100	.29	.32
200-275	32	120	S-24	100	.38	.41
105-125	16	60	S-18	250	.20	.22½
220-275	16	60	P-21	250	.22	.24½

EVEREADY DAYLO LIGHTS

The Light That Says "There It Is."

Eveready Daylos are furnished complete, equipped with Guaranteed Eveready Tungsten Batteries and Mazda Bulbs. Eveready Daylos have permanent contacts, permitting both flash and continuous light. Can be used with absolute safety around oil, gas, gunpowder and other explosive and inflammable material.

TUBULAR TYPE DAYLO



FIG. 3943

No.		Size, Inches	Price Ea. Complete	No. of Bat.	Price Ea. Extra Battery	No. of Bulb	Price Ea. Extra Bulb
2602	Vulcanized Fibre	1½ x 5	\$1.50	791	\$0.40	1182	\$0.17
2604	Vulcanized Fibre	1½ x 6½	1.75	790	.40	1198	.17
2612	Vulcanized Fibre	1½ x 8½	2.10	705	.60	1193	.17
2606	Leatherette Covered ..	1½ x 8½	1.75	705	.60	1193	.17

MINER'S TYPE DAYLO



FIG. 3944

2612	Vulcanized Fibre	1½ x 6½	2.10	790	.40	1198	.17
2619	Vulcanized Fibre	1½ x 8½	2.50	705	.60	1193	.17

VEST POCKET TYPE DAYLO

Bottom Opening
Nos. 6900 to 6954



FIG. 3945

Side Opening
Nos. 6990 to 6992



FIG. 3946

Silver Plated
Bottom Opening
Nos. 6980 to 6982



FIG. 3947

Black Cloth
Nos. 1991
to 6902



FIG. 3947A

See Sizes and Prices on following page.

EVEREADY DAYLO LIGHTS—CONTINUED

VEST POCKET TYPE DAYLO

NICKEL PLATED, BOTTOM OPENING

Mfrs. No.	Size, Inches	Price Ea. Complete	No. of Bat.	Price Ea. Extra Battery	No. of Bulb	Price Ea. Extra Bulb
6900	2½ x 1¼ x 1½	\$1.10	700	\$0.40	1179	\$0.17
6961	2½ x 1¾ x ¾	1.10	750	.40	1180	.17
6962	2½ x 2 x ¾	1.45	751	.45	1181	.17
6954	3½ x 1½ x 1	1.50	792	.40	1183	.17

NICKEL PLATED, SIDE OPENING

6990	2½ x 1½ x ¾	1.40	700	.40	1179	.17
6991	3¼ x 1¾ x ¾	1.40	750	.40	1180	.17
6992	3¼ x 2¾ x ¾	1.75	751	.45	1181	.17

SILVER PLATED, BOTTOM OPENING

6980	2½ x 1¼ x 1½	1.75	700	.40	1179	.17
6981	2½ x 1¾ x ¾	1.75	750	.40	1180	.17
6982	2½ x 2 x ¾	2.00	751	.45	1181	.17

BLACK CLOTH COVERED. (COAT POCKET TYPE)

1991	1½ x 2¼ x 5	1.75	793	.45	1197	.17
6903	1 x 2¾ x 3½	1.50	703	.45	1190	.17
6902	1 x 1½ x 3½	1.50	792	.40	1179	.17

HANDY LAMPS

Handy



FIG. 3948

Use standard six-inch dry cell, and will give about 50 hours of continuous burning. All metal with black enamel finish.

No. 4716. Reflector on top, less battery.....each \$1.50

No. 4718. Reflector on side, bail handle, less batteryeach 2.00

Renewal Eveready No. 406 Standard Dry Cell, Price on Application.

Renewal Mazda Bulb No. 1451, 1½ voltseach \$0.17

No. 4719. Same as 4716, less battery.....each 1.50

No. 4720. Same as 4718, less battery.....each 2.00
Renewal Mazda Bulb 2.9 volts No. 1198each .17

WESTINGHOUSE ELECTRIC FANS

Oscillating 10-inch Fan Non-Oscillating 10-inch Fan Whirlwind Fan
Shown in Desk Mounting Position Shown in Bracket Mounting Position



FIG. 3949



FIG. 3950



FIG. 3951

Drawn metal frame and base with smooth surface that takes an attractive finish. They give maximum air delivery with a minimum current consumption. The blades are properly designed and the hum is thereby eliminated. Need oiling but once a season. A felt base insures against scratching polished surfaces. Can be used for either upright or bracket mounting.

Non-oscillating fans can be tilted forward 15 degrees, backward 90 degrees (for bracket mounting), and rotated 340 degrees. A wing nut clamps all adjustments.

The oscillating mechanism is geared through a ball clutch which permits the oscillation to stop when the fan strikes an obstruction. Cannot drop oil. Oscillates through either 45 or 90-degree arcs as desired. Fan can be tilted 20 degrees forward or backward, when arranged for upright mounting. Oscillation can be stopped and started with fan running.

Price includes fan complete with separable attachment plug and 6-foot cord.

WHIRLWIND 8-INCH FANS

Frequency Cycles	Number of Blades	Volts	Watts at High Speed*	Average R.P.M.*	Cubic Ft. of Air Per Minute	Approx. Net	Wt., Lb. Boxed Each	Style No.	List Price
60	4	100-120	29	1625	350	6	12 1/4	253468	\$12.50
50	4	100-120	29	1400	300	6	12 1/4		
40	4	110-125	37	1750	390	6	12 1/4		
25-30	4	110-125	30	1350	290	6	12 1/4	253417	12.50
D.C.	4	100-125	24	2100	460	6	12 1/4	255725	12.50

10-INCH NON-OSCILLATING FANS

60	4	100-120	32	1450, 1250, 1000	550	7	16	241842	21.25
50	4	100-120	31	1325, 1250, 1175	500	7	16	241840	21.25
40	4	110-125	26	1500, 1200, 900	575	6	15	241838	21.25
25-30	4	100-125	24	1500, 1200, 900	575	6	15	241836	21.25
D.C.	4	100-125	22	1500, 1200, 900	575	6	15	241833	21.25

10-INCH OSCILLATING FANS

60	4	100-120	34	1450, 1250, 1100	550	9	19 1/2	241853	27.50
50	4	100-120	33	1325, 1225, 1050	500	9	19 1/2	241851	27.50
40	4	110-125	27	1500, 1200, 900	575	8	18 1/2	241849	27.50
25-30	4	100-125	25	1500, 1200, 900	575	8	18 1/2	241847	27.50
D.C.	4	100-125	23	1500, 1200, 900	575	8	18 1/2	241844	27.50

*Watts, speed, and air delivery may vary 10 per cent from figures given.

220-Volt Fans—For 220-volt A.C. fans, all types add \$2.00 and D.C. \$2.50 net extra.

30-Volt D.C. Fans—Same prices as Direct Current fans given above.

220-volt and 30-volt fans are not usually carried in stock.

WESTINGHOUSE ELECTRIC FANS

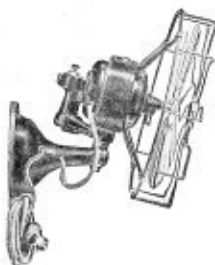


FIG. 3952
Oscillating 12-inch
Six-Blade Fan
Shown in Bracket Position



FIG. 3953
Non-Oscillating 12-inch
Four-Blade Fan
Shown in Desk Mounting Position



FIG. 3954
Oscillating 16-inch
Six-Blade Fan

12-INCH NON-OSCILLATING FANS

Freqcy C./c-sec	Number of Blades	Volts	Watts at High Speed*	Average R.P.M.*	Cu. Ft. of Air per Minute	Approx. Wt. Lb. Boxed	Style No.	List Price
60	4	100-120	42	1625, 1500, 1350	865	15	28	162628 \$26.25
50	4	100-120	35	1375, 1275, 1175	725	15	28	163537 26.25
40	6	110-125	40	1075, 1000, 950	875	15½	28½	162624 28.45
25-30	4	100-125	30	1600, 1250, 850	850	13	26	162620 27.50
D.C.	4	100-125	25	1600, 1300, 1000	850	13	26	162637 25.30

12-INCH OSCILLATING FANS

60	4	100-120	44	1625, 1500, 1350	865	17	31	164848 33.75
60	6	100-120	44	1050, 975, 900	850	17½	31½	164864 34.70
50	4	100-120	37	1375, 1275, 1175	1175	17	31	164867 33.75
40	6	110-125	42	1075, 1000, 950	875	17½	31½	164844 35.95
25-30	4	100-125	22	1600, 1250, 850	850	15	28	164860 35.00
D.C.	4	100-125	27	1600, 1300, 1000	850	15	29	164854 32.80

16-INCH NON-OSCILLATING FANS

60	4	100-120	83	1575, 1450, 1300	1700	19	40	162631 31.25
50	4	100-120	70	1375, 1275, 1175	1500	19	40	163540 31.25
40	6	110-125	80	1050, 950, 875	1725	19½	40½	162626 33.75
25-30	4	100-125	70	1600, 1250, 950	1725	16	38	162622 32.50
D.C.	4	100-125	63	1600, 1300, 1000	1725	16	37	162639 30.30

16-INCH OSCILLATING FANS

60	4	100-120	85	1575, 1450, 1300	1700	21	43	164851 38.12
60	6	100-120	85	1050, 975, 900	1725	21½	43½	177109 39.38
50	4	100-120	72	1375, 1275, 1175	1500	21	43	164870 38.12
40	6	110-125	82	1050, 950, 875	1725	21½	43½	164846 40.62
25-30	4	100-125	72	1600, 1250, 950	1725	18	40	164862 39.38
D.C.	4	100-125	65	1600, 1300, 1000	1725	18	40	164856 37.20

*Watts, speed, and air delivery may vary 10 per cent from figures given.

†Six-blade fans are more quiet than four-blade because they run at lower speed, but they deliver approximately the same volume of air.

220 Volt Fans—For 220-volt A. C. fans, all types, add \$2.00 and for D. C. \$2.50 net extra.

30-Volt D. C. Fans—Same prices as direct current fans given above.

220-volt and 30-volt fans are not usually carried in stock.

FARADAY SKELETON BELLS

MODEL "O" VIBRATING TYPE FOR BATTERY CIRCUITS

(Cannot be used on AC Circuits)

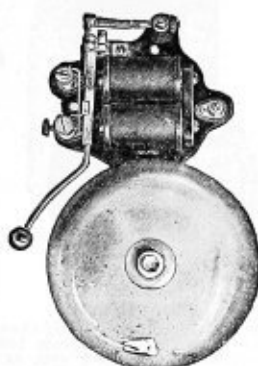


FIG. 3955

Skeleton Faraday Bells are designed to operate on battery circuits only; for bell-ringing transformer circuits, Transformer Enclosed-Type Single-Gong Bells, Transformer Enclosed-Type Double-Gong Bells, Transformer Underdome Gongs or P.R. Transformer Marlo Gongs are recommended; Transformer Skeleton Bells should never be used on electric light and power circuits.

Skeleton Faraday Bells will be furnished "Single-Stroke" when specially ordered, at \$0.50 net additional, but for important single-stroke work the special Faraday Single-Stroke Gong is recommended.

Skeleton Faraday Bells will be wound to any special resistance desired at standard list-additions.

Note—The Underwriters' Laboratories approve only the Enclosed-Type Faraday gongs for signal systems coming under their supervision.

Model No.	Size Gong inches	Frame No.	Resistance in ohms	List Price Each
O-2½	2½	1	1.5	\$3.30
O-3	3	1	1.5	3.55
O-4	4	1	1.5	4.05
O-5	5	2	2.1	5.50
O-6	6	2	2.1	6.20
O-8	8	3	3	9.70
O-10	10	4	5.2	16.60
O-12	12	X-5	5.2	20.75
O-14	14	X-5	5.2	41.45
O-15	15	X-5	5.2	53.85
OL-15	15	6	8	78.30
O-16	16	6	8	82.70
O-18	18	6	8	95.75

Assortment of all sizes Faraday and Ekla Skeleton Bells permitted to make up list-value, but Enclosed-Type Gongs or Buzzers cannot be included with Skeleton Bells; list-price additions for Special Resistance Windings may be included with bells and buzzers to make up list-value.

NET ADDITIONS FOR PLATINUM, TRIPLEX CONTACTS, ETC.

Platinum Contacts: Add to above prices for Pure Platinum Contacts, \$0.60 net for bells up to and including 6 inch; \$1.00 net for 7 inch and larger.

Triplex Contacts: Add to above prices for Triplex Platinoid Contacts, \$2.00 net. For Triplex Pure Platinum Contacts, add to above prices the following:

Up to and including 6 inch	net \$3.00
8 and 10 inch	net 4.00
12 and 14 inch	net 5.00
15 inch and larger	net 7.50

ENCLOSED-TYPE FARADAY SIGNAL GONGS VIBRATING-WEATHERPROOF-FOR BATTERY AND DC CIRCUITS

(Cannot be used on AC Circuits)

Model "C"
(Full-Grid-Guarded Gong)Model "A"
(Non-Guarded Gong)Model "B"
(Half-Grid-Guarded Gong)

FIG. 3956



FIG. 3957



FIG. 3958

Faraday Gongs, "A," "B" and "C," are designed to operate on Battery, and when ordered wound to proper resistance, on DC Electric Light and Power Circuits from 100 to 600 volts; for AC circuits, both Bell-Ringing Transformer and 100 to 240 volt AC circuits, Transformer Enclosed-Type Single-Gong, Transformer Enclosed-Type Double-Gong, Transformer Underdome Gongs, or P. R. Mario Transformer Gongs are recommended.

The gongs will be furnished "Single-Stroke" when specially ordered at \$0.50 Net Additional.

These gongs will be furnished wound to any special resistance desired at standard list-additions.

MODEL No. DO NOT FAIL TO specify Model No. and Voltage at which to operate.	Size Gong Inches. All Gongs Full Polished Nickel Unless Otherwise Specified	Frame No. (Size of Mechanism)	TO OPERATE ON BATTERY (Gongs to be Wired in Multiple)					To Operate on 100-125 Volt DG Circuits. In Multiple No External Resistance Required		To Operate on 220-250 Volt DC Circuits. In Multiple, No External Resistance Required		
			Number of Dry Cells Required at Normal Operation	Operative Voltage at Gong Terminals	Approx. Watt Consumption Per Gong	Regular Resistance Ohms for Battery Circuits	LIST PRICE EACH	Resistance Ohms for 100-125 Volts DC	LIST PRICE EACH	Resistance Ohms for 220-250 Volts DC	LIST PRICE EACH	
MODEL "A" NON-GUARDED GONGS—3½ INCHES TO 18 INCHES												
A-3½	3½		1	3	3	1.8	1.5	6.29	500	\$ 8.85	2000	\$ 12.95
A-4	4		1	3	3	1.8	1.5	6.44	500	9.20	2000	13.50
A-5	5		2	4	4	2.2	2.1	10.53	500	14.60	2000	19.50
A-6	6		2	4	4	2.2	2.1	11.92	500	15.75	2000	20.75
A-8	8		3	5	5	2.5	2.4	14.72	500	18.55	2000	23.50
A-10	10		4	6	6	2.5	2.4	24.69	500	29.00	2000	34.50
A-12	12	X-5	4	6	6	2.5	2.4	33.36	500	38.60	2000	44.50
A-14	14	X-5	6	8	8	2.5	2.4	41.15	500	46.00	2000	52.00
A-15	15		6	8	8	4	8	82.49	500	88.49	2000	93.75
A-16	16		6	8	8	4	8	86.41	500	92.41	2000	102.00
A-18	18		8	8	8	4	8	98.21	500	106.21	2000	110.00
MODEL "B" HALF-GRID-GUARDED GONGS—3½ IN. TO 14 IN.												
B-3½	3½		1	3	3	1.8	1.5	\$ 7.29	500	9.85	2000	13.95
B-4	4		1	3	3	1.8	1.5	7.44	500	10.20	2000	14.50
B-5	5		2	4	4	2.2	2.1	12.03	500	16.10	2000	21.00
B-6	6		2	4	4	2.2	2.1	13.42	500	17.25	2000	22.25
B-8	8		3	5	5	2.5	2.4	17.22	500	21.05	2000	26.00
B-10	10		4	6	6	2.5	2.4	27.09	500	32.00	2000	37.50
B-12	12	X-5	4	6	6	2.5	2.4	37.08	500	42.00	2000	48.50
B-14	14	X-5	6	8	8	2.5	2.4	45.15	500	50.00	2000	56.00
MODEL "C" FULL-GRID-GUARDED GONGS—5 IN. TO 12 IN.												
C-5	5		2	4	4	2.2	2.1	19.53	500	23.60	2000	28.50
C-6	6		2	4	4	2.2	2.1	20.92	500	24.75	2000	29.75
C-8	8		3	5	5	2.5	2.4	24.22	500	32.05	2000	37.00
C-10	10		4	6	6	2.5	2.4	44.60	500	49.00	2000	54.50
C-12	12	X-5	6	8	8	2.5	2.4	59.68	500	64.60	2000	70.50

Assortment of all sizes Enclosed-Type Gongs and Buzzers permitted to make up list-value, but Faraday EKLA Skeleton Bells cannot be included with Enclosed-Type Gongs or Buzzers; list-price additions for Special Resistance Windings may be included with bells to make up list-value.

No. 2



FIG. 3959

SAMSON WET BATTERIES AND PARTS

Samson No. 2	Standard Pkg.	List Price
Complete	50	\$1.85
Carbon	50	1.05
Zinc	100	.50
Sal Ammoniac	200	.20
Cover	100	.20
Jar	50	.30
Star Fenders	100	.10

No. 3



FIG. 3960

Samson No. 3

Complete	25	2.70
Carbon	50	1.30
Zinc	50	.60
Sal Ammoniac, 9 oz.	200	.30
Cover	25	.30
Jar, New Square, 7x5¼x5¼ in.	25	.60

Acme



FIG. 3961

DRY BATTERIES

ACME RAPID FIRE DRY BATTERIES
BEST IGNITION BATTERY

Are specially constructed for ignition service.

Long and lasting results assured, owing to extra amount of current producing materials used. Uniform in quality. Satisfaction guaranteed.

Furnished also in square cartons and spring clip connections.

Priceeach, \$0.50

1900 BATTERIES

For general service, including ignition, the 1900 is a most excellent battery.

Its lasting powers are exceptional.

Furnished also in square cartons and spring clips.

Priceeach, \$0.50

No. 1900



FIG. 3962

INSULATING TAPE



FIG. 3963



FIG. 3964

"BESTOVALL"

This is a large yardage tape, running 50 yards to the pound. The material is of light specific gravity which permits of large yardage; the compound is very durable and shows little or no deterioration after a period of one year. It is a tape of high quality and will give the most satisfactory service. Price, per lb. 75c.

"FORT PITT"

A heavier compound is used in our "Fort Pitt" tape and the yardage is 44 to the pound. The compound of this tape is of entirely different construction. It is much more fibrous and sticky, this being due to the great amount of compound used. "Fort Pitt" is a very durable tape and will give entire satisfaction. Price,per lb. 65c.



FIG. 3965

P & B INSULATING TAPE

An always pliable tape which never loses its adhesiveness; withstands exposure to weather, water, acids, gases, alkalis, etc.

1 lb. boxes, 1 inch wide....per lb. \$....
 1/2 lb. boxes, 3/4 inch wide....per lb.
 1/2 lb. boxes, 1/2 inch wide....per lb.

OKONITE TAPE

Okonite tape is a rubber insulating tape for making splices or joints.

List priceper pound \$2.00

MANSON TAPE

This is a rubber filled cloth tape for protecting joints against mechanical injury. Widths 1/2 or 3/4 inches.

List priceper pound, \$1.40



FIG. 3966



FIG. 3967

INSULATING COMPOUND AND VARNISHES



FIG. 3968

P & B ELECTRICAL COMPOUND

is invaluable for preserving and insulating switchboards, junction boxes, cut-outs, lamp brackets and hoods, frames, trays, armature bases, battery and accumulator boxes and shelves, dynamo connections, mouldings, underground and aerial cables and for numerous other electrical purposes.

No. 1 is used where an almost immediate drier and greatest amount of penetration possible is desired. No. 1 leaves less surface coat than No. 2.

For all general purposes No. 2 COMPOUND is desired.

	No. 1 Per Gallon	No. 2 Per Gallon
Barrels of about 50 gallons.....	\$1.50	\$1.35
Half barrels—30 gallons.....	1.60	1.45
5 gallon cans.....	1.65	1.50
2½ gallon cans (2 in case).....	1.70	1.55
1 gallon cans (6 in case).....	1.75	1.60
Quart cans (10 in case).....	2.30	2.15

S P C ARMATURE AND FIELD-COIL VARNISH

Barrels of about 50 gallons.....	per gallon, \$5.20
Half barrels—30 gallons.....	per gallon, 5.20
5 gallon cans.....	per gallon, 5.40
2½ gallon cans (2 in case).....	per gallon, 5.40
1 gallon cans (6 in case).....	per gallon, 5.45
Quart cans (10 in case).....	per gallon, 5.75

P & B BLACK FINISHING VARNISH

Air-dries; to handle within one-half hour. For Finishing Coat on all kinds of Electrical Machinery, including Armatures, Fields, Oil-Immersion Transformer Coils, etc. Resists moisture, dirt and oil.

	Per Gallon
Barrels of about 50 gallons.....	\$2.60
Half Barrels—30 gallons.....	2.65
5 gal. cans.....	2.85
2½ gal. cans.....	2.99
1 gal. cans (6 in case).....	2.95
Quart cans (10 in case).....	3.30

P & B AIR-DRYING VARNISH

Black and Clear

For quick repairs to dynamos and motors, air-cooled transformer coils; for dipping magnet, armature and field coils; for feed wires, cables and all overhead and underground connections. Quick drying, acid proof and moisture proof.

	Black Air-Dry'g Varnish	Clear Air-Dry'g Varnish
Barrels of about 50 gallons.....	per gallon, \$0.85	\$2.05
Half Barrels—30 gallons.....	per gallon, .90	2.10
5 gal. cans.....	per gallon, 1.00	2.25
2½ gal. cans.....	per gallon, 1.05	2.30
1 gal. cans (6 in case).....	per gallon, 1.10	2.35
Quart cans (10 in case).....	per gallon, 1.40	2.65

DAVEY FRICTION BOARD

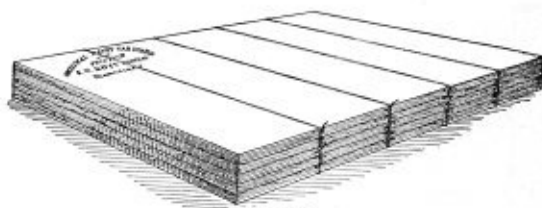


FIG. 3969

For agricultural, saw mill and wood-working machinery. Also used for electrical installation, Flange Joint Gaskets, Steam or Gas Pipe.

Size 34 by 44 inches. Five sheets to the inch. Prices on application.

SHEET FIBRE

Colors—red, gray or black. Special colors, 5c per lb. extra.

INTERMEDIATE SIZES at price of next thinner, except that on sizes from $\frac{1}{8}$ in. and up a variation of .015 in. or less will not be considered intermediate, and will take the price of the nearest standard thickness.

No extra charge is made for cutting sheets into two, three or four pieces without waste.

MINIMUM CHARGE for any one order, \$2.00.

AGGREGATING:—Several different thicknesses or colors may be aggregated in one shipment to determine the quantity discount. Large cut pieces 12 in. wide and more, containing 4 sq. ft. or more, accompanying an order for sheets, may be aggregated with the sheets, to determine the sheet price and the base price for the pieces, the usual addition being made, however, on the pieces for cutting.

Approximate Weight of Sheets								Approx. Size of Sheets	
Thick	Pounds	Thick	Pounds	Thick	Pounds	Thick	Pounds		
$\frac{1}{16}$	2½	$\frac{1}{8}$	40	$\frac{3}{16}$	90	$1\frac{1}{4}$	195	$\frac{1}{8}$ to $\frac{3}{4}$	thick 48" x 80"
$\frac{1}{8}$	5	$\frac{1}{4}$	50	$\frac{1}{2}$	100	$1\frac{1}{2}$	235	$\frac{1}{2}$ to 2	thick 44" x 70"
$\frac{3}{16}$	10	$\frac{3}{8}$	60	$\frac{5}{8}$	120	$1\frac{3}{4}$	275		thick 46" x 76"
$\frac{1}{4}$	20	$\frac{7}{8}$	70	$\frac{7}{8}$	138	2	315	We can also furnish Fibre up to .025" thick, in Rolls, about 46" wide.	
$\frac{3}{8}$	30	$1\frac{1}{2}$	80	1	155				

Thickness, in.	.005	.010	.015	.020 to $\frac{1}{8}$	$\frac{1}{16}$ to $\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{7}{8}$
Price, per lb.	\$1.50	1.30	1.10	1.00	1.02	1.06	1.12	1.18	1.28	
Thickness, in.	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	$1\frac{7}{8}$	2	
Price, per lb.	\$1.42	1.70	2.00	2.40	2.90	3.50	4.50	6.50	8.50	

FIBRE TUBES

Inside Diameter	Colors: Red, Black and Gray						
	Thickness of Wall						
	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$
$\frac{1}{8}$	\$0.20	\$0.30	\$0.40	\$....	\$....	\$....	\$....
$\frac{1}{16}$	.20	.30	.40	....	....	....	....
$\frac{1}{4}$	.10	.14	.18	.22	.26	....	....
$\frac{3}{16}$	.10	.15	.19	.24	.28	....	....
$\frac{3}{8}$	.11	.16	.21	.26	.31	....	....
$\frac{1}{2}$	.11	.17	.22	.28	.33	....	....
$\frac{1}{2}$	.12	.18	.24	.30	.36	.42	.48
$\frac{3}{4}$	.13	.20	.26	.32	.39	.46	.52
$\frac{5}{8}$	.14	.21	.28	.35	.42	.49	.56
$\frac{1}{2}$	.15	.23	.30	.37	.45	.52	.60
$\frac{3}{4}$	.16	.24	.32	.40	.48	.56	.64
$\frac{1}{2}$	.17	.26	.34	.42	.51	.60	.68
$\frac{7}{8}$	.18	.27	.36	.45	.54	.63	.72
$\frac{1}{2}$	.19	.29	.38	.47	.57	.66	.76
1	.20	.30	.40	.50	.60	.70	.80
$1\frac{1}{8}$	.22	.33	.44	.55	.66	.77	.88
$1\frac{1}{4}$	.24	.36	.48	.60	.72	.84	.96
$1\frac{3}{8}$	.26	.39	.52	.65	.78	.91	1.04
$1\frac{1}{2}$	.28	.42	.56	.70	.84	.98	1.12
$1\frac{5}{8}$	.30	.45	.60	.75	.90	1.05	1.20
$1\frac{3}{4}$	.32	.48	.64	.80	.96	1.12	1.28
$1\frac{7}{8}$	.34	.51	.68	.85	1.02	1.19	1.36
2	.36	.54	.72	.90	1.08	1.26	1.44
$2\frac{1}{8}$	.38	.57	.76	.95	1.14	1.33	1.52
$2\frac{1}{4}$	.40	.60	.80	1.00	1.20	1.40	1.60
$2\frac{3}{8}$	.42	.63	.84	1.05	1.26	1.47	1.68
$2\frac{1}{2}$	.44	.66	.88	1.10	1.32	1.54	1.76
$2\frac{5}{8}$	.46	.69	.92	1.15	1.38	1.61	1.84
$2\frac{3}{4}$	.48	.72	.96	1.20	1.44	1.68	1.92
$2\frac{7}{8}$	.50	.75	1.00	1.25	1.50	1.75	2.00
3	.52	.78	1.04	1.30	1.56	1.82	2.08
$3\frac{1}{8}$	.54	.81	1.08	1.35	1.62	1.89	2.16
$3\frac{1}{4}$	.56	.84	1.12	1.40	1.68	1.96	2.24
$3\frac{3}{8}$	.58	.87	1.16	1.45	1.74	2.03	2.32
$3\frac{1}{2}$	.60	.90	1.20	1.50	1.80	2.10	2.40
$3\frac{5}{8}$	.62	.93	1.24	1.55	1.86	2.17	2.48
$3\frac{3}{4}$	.64	.96	1.28	1.60	1.92	2.24	2.56
$3\frac{7}{8}$	.66	.99	1.32	1.65	1.98	2.31	2.64
4	.68	1.02	1.36	1.70	2.04	2.38	2.72

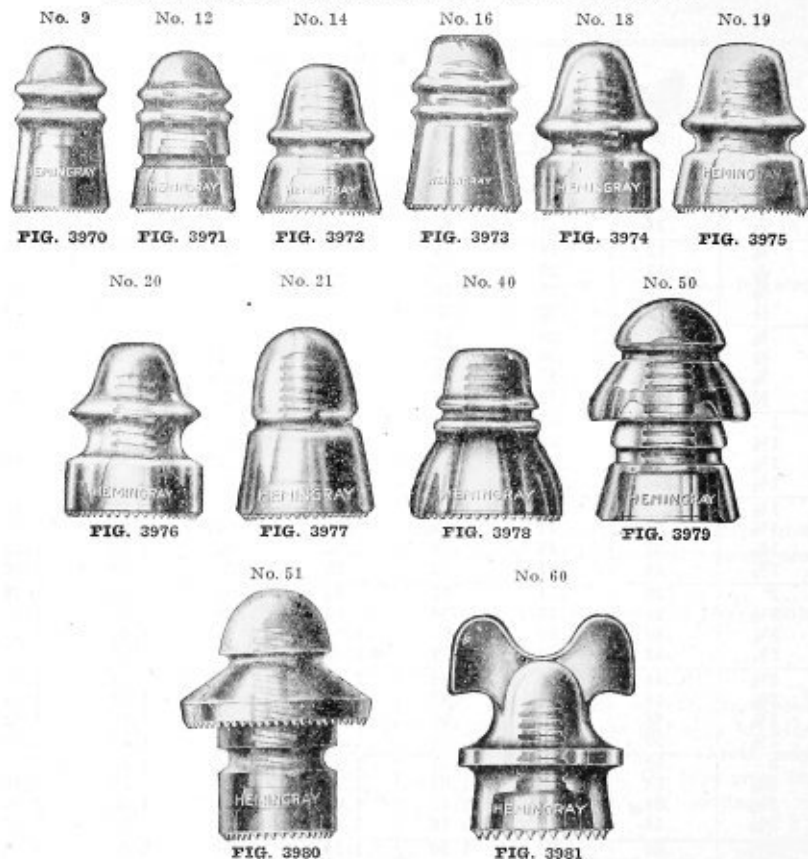
The above are prices per foot in lengths of 2 to 3 feet.

Square tubes take double List of Round.

Intermediate diameter takes list of next larger inside diameter having same thickness of wall, excepting that sizes between $\frac{3}{16}$ in. and $\frac{1}{4}$ in. inside diameter take the $\frac{1}{8}$ in. price.

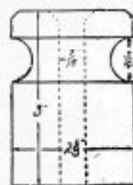
Intermediate walls take list of next thicker wall.

STANDARD HEMINGRAY INSULATORS



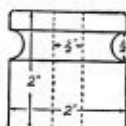
Mfrs. No.	Title	Diam. Groove Inches	Weight Each Ounces	Wgt. 1000 Packed Pounds	Std. Bbl. Quantity	List
						Price per 1000 F.O.B. Factory
9	Pony	$\frac{3}{8}$	9	675	400	\$29.50
12	D. G. Pony	$\frac{3}{8}$	10 $\frac{1}{2}$	750	400	29.50
14	D. G. D. P. Pony	$\frac{3}{8}$	11 $\frac{1}{2}$	865	300	39.90
16	Long Dist.	$\frac{3}{8}$	14	967	300	40.30
18	Deep Grove	$\frac{1}{2}$	17	1200	250	44.35
19	D. G. D. P.	$\frac{1}{2}$	19	1350	200	52.40
20	Ex D. G. D. P.	$\frac{3}{4}$	20	1375	200	52.40
21	W. U. D. P.	$\frac{3}{8}$	22	1550	200	54.40
40	D. P. (New)	$\frac{5}{8}$	22	1550	200	58.50
50	2 Pe. Trans.	$\frac{3}{8}$	25	1950	125	110.80
51	Trans.	$\frac{3}{8}$	34	2500	100	110.80
60	Cable	1 $\frac{1}{2}$, 2	30	2300	100	80.55

PORCELAIN INSULATORS



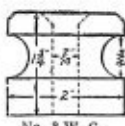
No. 1

FIG. 3982



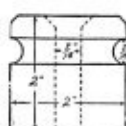
No. 2

FIG. 3983



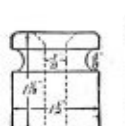
No. 3 W. G.

FIG. 3984



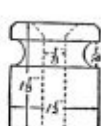
No. 3 1/2

FIG. 3985



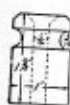
No. 4

FIG. 3986



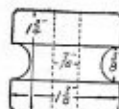
No. 4 1/2

FIG. 3987



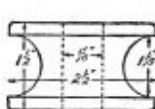
No. 4 1/2 old code

FIG. 3988



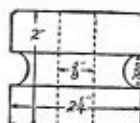
No. 24

FIG. 3989



No. 25

FIG. 3990



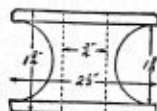
No. 26

FIG. 3991



No. 29

FIG. 3992



No. 39

FIG. 3993

No. 1849
Split

FIG. 3994

No. 9419
Split

FIG. 3995

No.	Height, Inches	Diam. Inches	Hole, Inches	Groove Inches	Quantity Per Bbl.	Weight Per Bbl.	Price Per 1000 Pieces
1	3	2 1/2	1 1/2	3/4	675	465	\$95.00
2	2	2	1 1/2	1 1/2	1050	475	65.00
3WG.	1 3/4	2	1 1/2	3/4	1200	470	54.00
3 1/2	2	2	1 1/2	1 1/2	1050	450	65.00
4	1 1/2	1 1/2	3/4	3/4	2200	490	22.00
4 1/2	1 3/4	1 1/2	3/4	1 1/2	1900	475	25.00
5	1 1/4	1	3/4	1 1/2	6000	480	13.00
5 1/2 Old Code	1 1/2	1	3/4	1 1/2	5300	500	13.00
24	1 3/4	1 3/4	1 1/2	3/4	1200	475	47.00
25	1 1/2	2 1/2	1 1/2	1 1/2	750	440	81.00
26	2	2 1/4	5/8	1 1/2	800	475	81.00
29	2 1/4	2 1/2	1 1/2	1 1/4	575	400	132.00
39	1 3/4	2 1/2	3/4	1 3/8	650	425	54.00

SPLIT KNOBS

No.	No. Grooves	Size Wire	Diameter Inches	Height, Inches	Std. Package	Std. Pkg. Gross Wt.	Price Per 1000 Pieces
1849 Old Code	2	12 to 14	1 1/4	1 3/4	4000	500	\$24.00
1849 New Code	1	12 to 14	1	1 3/4	4500	500	22.00
9419	4	8 to 10	1 1/2	1 7/8	2000	500	41.00
9420	4	4 to 6	2	2 3/8	1000	475	63.00

PORCELAIN TUBES—UNGLAZED



FIG. 3996

Diameter I. D.	O. D.	Length Inches	Std. Pkg.	Std. Pkg. Wt. Gross	Price per M Pieces	Diameter I. D.	O. D.	Length Inches	Std. Pkg.	Std. Pkg. Wt. Gross	Price per M Pieces
$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{2}$	15000	375	\$ 13.00	$\frac{1}{8}$	$\frac{1}{4}$	24	300	260	\$648.00
$\frac{1}{8}$	$\frac{1}{4}$	1	11000	375	13.00	$\frac{1}{8}$	$\frac{1}{4}$	1	4500	380	27.00
$\frac{1}{8}$	$\frac{1}{4}$	$1\frac{1}{2}$	9000	375	14.00	$\frac{1}{8}$	$\frac{1}{4}$	$1\frac{1}{2}$	3200	375	28.00
$\frac{1}{8}$	$\frac{1}{4}$	2	7000	375	15.00	$\frac{1}{8}$	$\frac{1}{4}$	2	2500	355	34.00
$\frac{1}{8}$	$\frac{1}{4}$	$2\frac{1}{2}$	6000	360	16.00	$\frac{1}{8}$	$\frac{1}{4}$	$2\frac{1}{2}$	2000	325	40.00
$\frac{1}{8}$	$\frac{1}{4}$	3	5200	340	18.00	$\frac{1}{8}$	$\frac{1}{4}$	3	1809	320	47.00
$\frac{1}{8}$	$\frac{1}{4}$	4	3900	315	27.00	$\frac{1}{8}$	$\frac{1}{4}$	4	1450	325	55.00
$\frac{1}{8}$	$\frac{1}{4}$	5	3500	340	33.00	$\frac{1}{8}$	$\frac{1}{4}$	5	1200	320	64.00
$\frac{1}{8}$	$\frac{1}{4}$	6	3200	350	40.00	$\frac{1}{8}$	$\frac{1}{4}$	6	1000	305	73.00
$\frac{1}{8}$	$\frac{1}{4}$	8	2200	340	72.00	$\frac{1}{8}$	$\frac{1}{4}$	8	700	275	108.00
$\frac{1}{8}$	$\frac{1}{4}$	10	1700	335	96.00	$\frac{1}{8}$	$\frac{1}{4}$	10	500	255	180.00
$\frac{1}{8}$	$\frac{1}{4}$	12	1200	340	144.00	$\frac{1}{8}$	$\frac{1}{4}$	12	375	220	240.00
$\frac{1}{8}$	$\frac{1}{4}$	14	1000	335	242.00	$\frac{1}{8}$	$\frac{1}{4}$	14	310	215	432.00
$\frac{1}{8}$	$\frac{1}{4}$	16	800	340	347.00	$\frac{1}{8}$	$\frac{1}{4}$	16	250	205	519.00
$\frac{1}{8}$	$\frac{1}{4}$	18	500	340	389.00	$\frac{1}{8}$	$\frac{1}{4}$	18	200	205	605.00
$\frac{1}{8}$	$\frac{1}{4}$	20	450	340	432.00	$\frac{1}{8}$	$\frac{1}{4}$	20	160	175	648.00
$\frac{1}{8}$	$\frac{1}{4}$	22	400	340	497.00	$\frac{1}{8}$	$\frac{1}{4}$	22	160	185	692.00
$\frac{1}{8}$	$\frac{1}{4}$	24	400	340	563.00	$\frac{1}{8}$	$\frac{1}{4}$	24	160	195	735.00
$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{2}$	12500	375	15.00	$\frac{3}{16}$	$\frac{1}{2}$	1	3700	330	39.00
$\frac{3}{16}$	$\frac{1}{2}$	1	9500	375	15.00	$\frac{3}{16}$	$\frac{1}{2}$	$1\frac{1}{2}$	2500	320	43.00
$\frac{3}{16}$	$\frac{1}{2}$	$1\frac{1}{2}$	8000	375	16.00	$\frac{3}{16}$	$\frac{1}{2}$	2	1800	310	55.00
$\frac{3}{16}$	$\frac{1}{2}$	2	7000	370	19.00	$\frac{3}{16}$	$\frac{1}{2}$	$2\frac{1}{2}$	1500	295	65.00
$\frac{3}{16}$	$\frac{1}{2}$	$2\frac{1}{2}$	5000	350	22.00	$\frac{3}{16}$	$\frac{1}{2}$	3	1250	285	72.00
$\frac{3}{16}$	$\frac{1}{2}$	3	3800	340	26.00	$\frac{3}{16}$	$\frac{1}{2}$	4	850	250	88.00
$\frac{3}{16}$	$\frac{1}{2}$	4	2900	340	32.00	$\frac{3}{16}$	$\frac{1}{2}$	5	700	255	104.00
$\frac{3}{16}$	$\frac{1}{2}$	5	2500	340	38.00	$\frac{3}{16}$	$\frac{1}{2}$	6	600	255	124.00
$\frac{3}{16}$	$\frac{1}{2}$	6	2000	335	48.00	$\frac{3}{16}$	$\frac{1}{2}$	8	450	245	156.00
$\frac{3}{16}$	$\frac{1}{2}$	8	1600	340	84.00	$\frac{3}{16}$	$\frac{1}{2}$	10	350	240	218.00
$\frac{3}{16}$	$\frac{1}{2}$	10	1200	320	108.00	$\frac{3}{16}$	$\frac{1}{2}$	12	325	240	281.00
$\frac{3}{16}$	$\frac{1}{2}$	12	1000	305	156.00	$\frac{3}{16}$	$\frac{1}{2}$	14	250	230	495.00
$\frac{3}{16}$	$\frac{1}{2}$	14	800	200	277.00	$\frac{3}{16}$	$\frac{1}{2}$	16	185	205	585.00
$\frac{3}{16}$	$\frac{1}{2}$	16	700	300	389.00	$\frac{3}{16}$	$\frac{1}{2}$	18	160	200	674.00
$\frac{3}{16}$	$\frac{1}{2}$	18	450	290	432.00	$\frac{3}{16}$	$\frac{1}{2}$	20	125	180	719.00
$\frac{3}{16}$	$\frac{1}{2}$	20	400	290	476.00	$\frac{3}{16}$	$\frac{1}{2}$	22	125	200	810.00
$\frac{3}{16}$	$\frac{1}{2}$	22	400	290	540.00	$\frac{3}{16}$	$\frac{1}{2}$	24	125	210	900.00
$\frac{3}{16}$	$\frac{1}{2}$	24	400	300	605.00	1	$\frac{1}{8}$	1	2000	350	59.00
$\frac{1}{2}$	$\frac{3}{4}$	1	8500	360	21.00	1	$\frac{1}{8}$	$1\frac{1}{2}$	1500	360	69.00
$\frac{1}{2}$	$\frac{3}{4}$	$1\frac{1}{2}$	7500	360	22.00	1	$\frac{1}{8}$	2	1100	345	78.00
$\frac{1}{2}$	$\frac{3}{4}$	2	5000	355	26.00	1	$\frac{1}{8}$	$2\frac{1}{2}$	900	330	91.00
$\frac{1}{2}$	$\frac{3}{4}$	$2\frac{1}{2}$	4000	350	30.00	1	$\frac{1}{8}$	3	750	315	104.00
$\frac{1}{2}$	$\frac{3}{4}$	3	2700	340	34.00	1	$\frac{1}{8}$	4	600	300	130.00
$\frac{1}{2}$	$\frac{3}{4}$	4	2000	335	41.00	1	$\frac{1}{8}$	5	500	290	163.00
$\frac{1}{2}$	$\frac{3}{4}$	5	1700	340	48.00	1	$\frac{1}{8}$	6	400	280	186.00
$\frac{1}{2}$	$\frac{3}{4}$	6	1500	340	55.00	1	$\frac{1}{8}$	8	325	290	218.00
$\frac{1}{2}$	$\frac{3}{4}$	8	1200	335	96.00	1	$\frac{1}{8}$	10	245	270	250.00
$\frac{1}{2}$	$\frac{3}{4}$	10	1000	335	120.00	1	$\frac{1}{8}$	12	190	255	343.00
$\frac{1}{2}$	$\frac{3}{4}$	12	800	340	168.00	1	$\frac{1}{8}$	14	150	230	540.00
$\frac{1}{2}$	$\frac{3}{4}$	14	700	320	311.00	1	$\frac{1}{8}$	16	140	230	674.00
$\frac{1}{2}$	$\frac{3}{4}$	16	550	300	432.00	1	$\frac{1}{8}$	18	110	210	764.00
$\frac{1}{2}$	$\frac{3}{4}$	18	475	250	519.00	1	$\frac{1}{8}$	20	85	195	853.00
$\frac{1}{2}$	$\frac{3}{4}$	20	300	270	563.00	1	$\frac{1}{8}$	22	85	205	922.00
$\frac{1}{2}$	$\frac{3}{4}$	22	300	260	605.00	1	$\frac{1}{8}$	24	85	215	1,000.00

Quantities and weights given are approximately correct, but not guaranteed.

PORCELAIN TUBES—UNGLAZED—CONTINUED

Diameters I.D. O.D.	Length Inches	Std. Pkg.	Std. Pkgs. Wgt. Gross	Price per M Pieces	Diameters I.D. O.D.	Length Inches	Std. Pkg.	Std. Pkgs. Wgt. Gross	Price per M Pieces
1 1/4	1 1/2	2 1/2	525 320	\$ 122.00	2 1/4	3 1/2	2 1/2	...	\$ 268.00
1 1/4	1 1/2	3	425 310	138.00	2 1/4	3 3/4	3	...	296.00
1 1/4	1 1/2	4	360 310	156.00	2 1/4	3 3/4	4	...	315.00
1 1/4	1 1/2	5	325 305	181.00	2 1/4	3 3/4	5	...	488.00
1 1/4	1 1/2	6	250 300	192.00	2 1/4	3 3/4	6	...	705.00
1 1/4	1 1/2	8	180 290	240.00	2 1/4	3 3/4	8	...	898.00
1 1/4	1 1/2	10	140 265	312.00	2 1/4	3 3/4	10	...	977.00
1 1/4	1 1/2	12	120 265	456.00	2 1/4	3 3/4	12	...	1,540.00
1 1/4	1 1/2	14	100 255	761.00	2 1/4	3 3/4	14	...	2,662.00
1 1/4	1 1/2	16	85 175	900.00	2 1/4	3 3/4	16	...	2,814.00
1 1/4	1 1/2	18	70 235	1,037.00	2 1/4	3 3/4	18	...	3,332.00
1 1/4	1 1/2	20	55 215	1,141.00	2 1/4	3 3/4	20	...	3,691.00
1 1/4	1 1/2	22	55 228	1,244.00	2 1/4	3 3/4	22	...	4,064.00
1 1/4	1 1/2	24	55 240	1,348.00	2 1/4	3 3/4	24	...	4,439.00
1 1/2	2 1/2	2 1/2	350 325	156.00	2 1/2	3 1/2	2 1/2	...	303.00
1 1/2	2 1/2	3	300 315	174.00	2 1/2	3 1/2	3	...	325.00
1 1/2	2 1/2	4	250 305	192.00	2 1/2	3 1/2	4	...	353.00
1 1/2	2 1/2	5	225 305	253.00	2 1/2	3 1/2	5	...	568.00
1 1/2	2 1/2	6	180 305	312.00	2 1/2	3 1/2	6	...	832.00
1 1/2	2 1/2	8	140 300	384.00	2 1/2	3 1/2	8	...	1,056.00
1 1/2	2 1/2	10	110 300	456.00	2 1/2	3 1/2	10	...	1,135.00
1 1/2	2 1/2	12	90 280	692.00	2 1/2	3 1/2	12	...	1,800.00
1 1/2	2 1/2	14	75 275	1,175.00	2 1/2	3 1/2	14	...	3,118.00
1 1/2	2 1/2	16	65 265	1,314.00	2 1/2	3 1/2	16	...	3,269.00
1 1/2	2 1/2	18	55 250	1,472.00	2 1/2	3 1/2	18	...	3,853.00
1 1/2	2 1/2	20	40 220	1,625.00	2 1/2	3 1/2	20	...	4,271.00
1 1/2	2 1/2	22	40 240	1,780.00	2 1/2	3 1/2	22	...	4,708.00
1 1/2	2 1/2	24	40 250	1,936.00	2 1/2	3 1/2	24	...	5,142.00
1 3/4	2 1/2	2 1/2	250 380	198.00	2 3/4	4 1/4	2 1/2	...	455.00
1 3/4	2 1/2	3	225 370	220.00	2 3/4	4 1/4	3	...	488.00
1 3/4	2 1/2	4	200 360	239.00	2 3/4	4 1/4	4	...	529.00
1 3/4	2 1/2	5	175 340	341.00	2 3/4	4 1/4	5	...	852.00
1 3/4	2 1/2	6	150 320	453.00	2 3/4	4 1/4	6	...	1,248.00
1 3/4	2 1/2	8	100 300	581.00	2 3/4	4 1/4	8	...	1,584.00
1 3/4	2 1/2	10	80 290	660.00	2 3/4	4 1/4	10	...	2,000.00
1 3/4	2 1/2	12	70 280	1,021.00	2 3/4	4 1/4	12	...	3,000.00
1 3/4	2 1/2	14	90 260	1,748.00	2 3/4	4 1/4	14	...	4,000.00
1 3/4	2 1/2	16	60 255	1,901.00	2 3/4	4 1/4	16	...	4,903.00
1 3/4	2 1/2	18	50 250	2,284.00	2 3/4	4 1/4	18	...	5,779.00
1 3/4	2 1/2	20	50 240	2,537.00	2 3/4	4 1/4	20	...	6,406.00
1 3/4	2 1/2	22	50 245	2,779.00	2 3/4	4 1/4	22	...	7,061.00
1 3/4	2 1/2	24	50 250	3,028.00	2 3/4	4 1/4	24	...	7,712.00
2	2 1/2	2 1/2	...	234.00	3	4 1/2	2 1/2	...	682.00
2	2 1/2	3	...	258.00	3	4 1/2	3	...	732.00
2	2 1/2	4	...	277.00	3	4 1/2	4	...	794.00
2	2 1/2	5	...	417.00	3	4 1/2	5	...	1,278.00
2	2 1/2	6	...	579.00	3	4 1/2	6	...	1,872.00
2	2 1/2	8	...	739.00	3	4 1/2	8	...	2,376.00
2	2 1/2	10	...	818.00	3	4 1/2	10	...	3,000.00
2	2 1/2	12	...	1,280.00	3	4 1/2	12	...	4,050.00
2	2 1/2	14	...	2,204.00	3	4 1/2	14	...	6,000.00
2	2 1/2	16	...	2,358.00	3	4 1/2	16	...	7,355.00
2	2 1/2	18	...	2,809.00	3	4 1/2	18	...	8,670.00
2	2 1/2	20	...	3,310.00	3	4 1/2	20	...	9,610.00
2	2 1/2	22	...	3,421.00	3	4 1/2	22	...	10,591.00
2	2 1/2	24	...	3,733.00	3	4 1/2	24	...	11,569.00

Quantities and Weights given are approximately correct, but not guaranteed.

STANDARD CROSS ARMS

3 1-4X4 1-4 INCHES, 1 1-2 INCH HOLES, PAINTED TWO COATS



FIG. 3997

Number	Length, feet	Holes for Pins	Price Each
1.....	3	2	\$....
2.....	4	4	....
3.....	5	4	....
4.....	6	4	....
5.....	6	6	....

Arms of special dimensions or borings furnished to order.

CROSS ARM BRACES

APPROXIMATE WEIGHT PER 1000 BRACES

Length	Plain	Galvanized
1 1/4 x 1/4 x 20 inches	1,775 pounds	1,865 pounds
22 inches	1,950 pounds	2,050 pounds
24 inches	2,125 pounds	2,235 pounds
26 inches	2,300 pounds	2,420 pounds
28 inches	2,475 pounds	2,605 pounds
30 inches	2,650 pounds	2,790 pounds
1 3/8 x 3/8 x 20 inches	1,545 pounds	1,645 pounds
22 inches	1,700 pounds	1,800 pounds
24 inches	1,855 pounds	1,955 pounds
26 inches	2,010 pounds	2,110 pounds
28 inches	2,165 pounds	2,265 pounds
30 inches	2,320 pounds	2,420 pounds

Standard sizes are 1 1/4 x 1/4 and 1 3/8 x 3/8 punched for 3/8 and 1/2 inch bolt.

Weights given are for exact dimensions, both width and thickness; can be furnished to lighter weights if desired.

WOOD BRACKETS

OAK PAINTED

Size Inches	Sack Contains	Wt. Lbs. per 100	Price per 1000
1 1/2 x 2 x 12	250	700	\$18.50
2 x 2 1/4 x 12	250	1,000	28.00
1 1/2 x 2 1/4 x 12	250	800	20.00
1 1/2 x 2 x 10	250	500	16.50

FIG. 3998

W. U. UNPAINTED

2 x 2 3/8 x 12	100	1,100	30.00
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WESTERN UNION STEEL PIN



FIG. 3999

No. 5.	1/2 inch.....	per 100	\$....
No. 6.	3/8 inch.....	per 100	

KLEIN'S WIRE SPLICING CLAMPS

No. 102-1

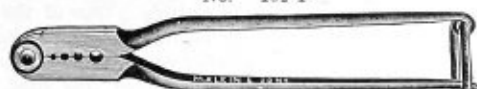


FIG. 4000

No. 102-3



FIG. 4001

No. 102-5



FIG. 4002

No. 102-4



FIG. 4003

No. 105-12



FIG. 4004

No. 132-3

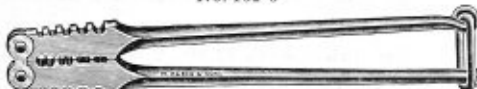


FIG. 4005

No. 132-5

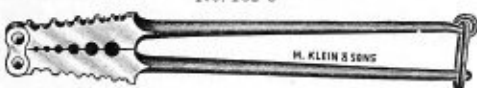


FIG. 4006

No. 102-1. Has four round holes, holding all sizes copper wire from 10 to 16 B. & S. gage, and iron wire 12 to 14 B. W. G. Size, 7 in. list price each \$3.50

No. 102-3. Has five round holes, holding all sizes copper wire 4 to 12 B. & S. gage, and iron wire from 6 to 14 B. W. G. Size, 10½ in. list price each \$4.60

No. 102-5. Has three oval and two round holes, holding all sizes copper wire 2 to 12 B. & S. gage, and iron wire 4 to 14 B. W. G. Size, 10½ in. list price each \$4.60

No. 102-4. For heavy wire. Has three oval holes for iron wire Nos. 2 to 6 B. W. G., and copper wire Nos. 0 to 4 B. & S. gage. Size, 10¾ in. list price each \$4.60

No. 105-12. Has four sets of chambers adapted for twisting double tube copper sleeve joints Nos. 6 to 17 B. & S. gage, and iron sleeve joints Nos. 8 to 18 B. W. G. Size, 10½ in. list price each \$4.60

KLEIN'S COMBINATION WIRE AND SLEEVE CLAMPS

No. 132-3. Covers the range of bare wires linemen usually handle. Has five round holes which will accommodate all sizes of iron wire Nos. 6 to 14 B. W. G., and all sizes of copper wire Nos. 4 to 12 B. & S. gage. The reverse side has four sets of chambers adapted for twisting double tube copper sleeve joints Nos. 8 to 14 B. & S. gage, and iron sleeve joints Nos. 10 to 16 B. W. G. Size, 10¾ inch. list price, each \$4.60

No. 132-5. This clamp is intended for general telephone and telegraph work where a large range of wires is used. It has five round holes and will accommodate all sizes of iron wire Nos. 6 to 16 B. W. G., and all sizes of copper wire from 4 to 14 B. & S. gage. The reverse side has five sets of chambers adapted for twisting double tube copper sleeve joints Nos. 6 to 14 B. & S. gage, and iron sleeve joints Nos. 8 to 16 B. W. G. Size, 11¼ inch. list price, each \$6.00

KLEIN'S LINEMAN'S AND ELECTRICIAN'S PLIERS

No. 201



FIG. 4007

Length	inches	5	6	7	8	9	10
List price	each	\$2.90	3.50	4.00	4.60	6.00	7.00

No. 201. Side Cutting. One of the most popular pliers on the market. Powerful leverage, reinforced cutting edges, hand forged from special bar tool steel, handles shaped to the hand. Especially adapted for general use. Polished head, black handles.

No. 2400
Rubber Sleeves

FIG. 4008

No. 2400. Rubber Sleeves are made of pure gum rubber. Will not crack or chip, and fit tightly over plier handles.

For Pliers size.....inch	6	7	8
List price.....per pair	\$1.00	1.10	1.20

No. 202



FIG. 4009

No. 202. Oblique Cutting. Lap joint type. Narrow head, permitting its use in confined places for close cutting. Knives are perfectly fitted, meeting accurately at all points. Polished head, black handles.

Length ..inches	4½	5	5½	6
List price..each	\$2.80	2.90	3.00	3.10

No. 301



FIG. 4010

No. 301. Long Nose. Without cutter. Especially adapted to stripping the ends of insulated wire. Tempered and hardened; jaws and handles will not spring when pressure is applied.

Polished head, black handles.

Length .....inches	5	6	7
List price .....each	\$2.30	2.60	2.90

No. 203



FIG. 4011

No. 203. Long Nose. Same as No. 301, except fitted with cutting knives.

Polished head, black handles.

Length .....inches	5	6	7
List price .....each	\$2.60	2.90	3.20

Packed one in a carton. Six in standard package.

KLEIN'S LINEMEN'S TOOLS

ELECTRICIANS' SCISSORS

A scissor designed for the electrician and mechanic. Will stand continued hard service. Made of high-grade steel, properly tempered. Nickel plated finish.

Size, 5 inches.....list price, each \$2.50

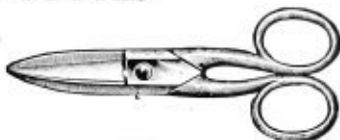


FIG. 4012

ELECTRICIANS' KNIFE



FIG. 4013

A handy combination for the electrician, combining an emergency screw driver, a knife blade for cutting or stripping wire; safely locked so that it cannot close during use. Screw driver blade is locked when open; to unlock, press down on large blade.

No. 1550-1 1550-2
No. Blades 1 2
List price.....each \$2.00 2.50

WIRE SKINNERS OR PEELERS

P. & G. For removing insulation from small wire and up to No. 4, either single or stranded. The only tool that will remove the outer braid from B. X. Splits the outer insulation on a duplex wire by one pull, leaving the braid adhering to the inner wires. Has a scraper for cleaning the wire ready for soldering. One-third actual size.

P. & G. List price.....each \$2.50
Klein's. List price.....each 1.20

P. & G.

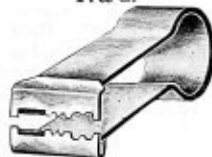


FIG. 4014

Klein's



FIG. 4015

INSPECTOR'S HARNESS LEATHER TOOL BAGS

This bag is a combination of the good features of the various common leather bags. It is made of harness leather and will stand rough and hard usage and still always look well. It has a shoulder strap combined with a pad and hand strap; also a saw and bit holder. The bottom is three ply and is studded with steel studs. Retaining straps pass clear around the bag so that it may be loaded to the limit of its capacity and be securely held intact. All seams are sewed with hot waxed linen thread, lock stitched. The leather used is water proofed.

Sizeinches 14x8 16x8 18x8 20x8 22x8 24x8
List priceeach \$14.00 15.20 16.60 18.00 19.40 20.80



FIG. 4016

LINEMEN'S CANVAS, LEATHER BOTTOM, TOOL BAGS

This bag is made of one piece of No. 6 white duck reinforced all around the bottom, 3 1/4 inches up, with heavy bag-leather. The bottom is made of heavy leather outside and duck inside, lock stitched all around. This lock stitch forms an independent knot in each stitch, making it impossible to rip. The bottom is studded with strong steel studs. Bottoms and sides are joined together with lock-stitched leather welt seams. Mouth of the bag is formed by a 12-gage steel frame; the canvas is clinched between this frame and an inside secondary steel frame. Has harness leather handles and two retaining straps with buckles.

Sizeinches 12 14 16 18 20 22 24
List priceeach \$6.60 7.40 8.00 8.60 9.20 10.00 11.00



FIG. 4017

KLEIN'S LINEMEN'S TOOLS

EASTERN CLIMBERS

No. 1901



FIG. 4018

No. 1901. Has punched strap loops. Lengths from 15 to 18 inches, from the instep to end of shank, by $\frac{1}{2}$ inch variations.

Sizes, 15 to 18 inches.....list price, per pair \$5.70

No. 1900



FIG. 4019

No. 1900. Same as No. 1901 except has riveted strap loops.

Sizes, 15 to 18 inches....list price, per pair \$6.30

In ordering, always give length of shank wanted.

CLIMBER STRAPS

No. 5301-1

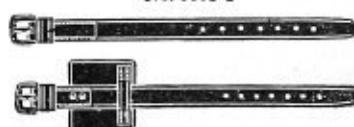


FIG. 4020

Set consists of two upper straps with 4x4 plain leather pads and two lower straps as shown. Select oak tanned harness leather; extra heavy roller buckles. Heel and calf straps (over all) 22 inches long, $1\frac{1}{4}$ inches wide.

No. 5301-1. Plain Pads.....

.....list price, per set \$5.70

SAFETY TOOL BELTS



FIG. 4021

Made of select harness leather. Loop layer is $1\frac{1}{8}$ inches wide, formed into 6 tool loops. Provided with strong D rings securely sewed in and riveted to the main belt which also passes through the D rings. Always specify lengths. Made in 38, 40, 42, 44 and 46 inch.

No. 5202. $2\frac{1}{4}$ inch.....list price, each \$7.60

No. 5204. $3\frac{1}{2}$ inch.....list price, each 9.40

SAFETY STRAPS

No. 5250



FIG. 4022

Cut out of high grade harness leather, securely sewed, riveted and double reinforced strong japped snaps and buckles. Strap may be shortened or lengthened by adjusting buckle.

Size, $1\frac{3}{4}$ in. by 6 ft., with Imperial Snaps.....list price, each \$6.80

Nos. 5251 and 5253



FIG. 4023

These straps are cut out of high grade harness leather, securely sewed, riveted and doubly reinforced. Equipped with heavy roller snaps. One snap is stationary, while the other one is loose, so that the strap can be adjusted by buckle, either shortening or lengthening the same.

No. 5251. $1\frac{3}{4}$ in. by 6 ft., with roller snaps.....list price, each \$7.20

No. 5253. 2 in. by 6 ft., with roller snaps.....list price, each 9.60

KLEIN'S LINEMEN'S TOOLS

COMBINATION STEEL LAG SCREW WRENCH



FIG. 4024

Forged from select steel. The slot is cross shape and fits machine bolts, nuts or lag screws from $\frac{3}{8}$ in. to $\frac{5}{8}$ in. The small end is arranged for $\frac{1}{2}$ in. machine bolts or lag screws. The round hole allows the bolt to come through as nut is run on.

No. 3109-20. Length, $13\frac{1}{2}$ inches.....list price, each \$4.00

"CHICAGO" GRIPS FOR BARE WIRE

No. 1613 Series

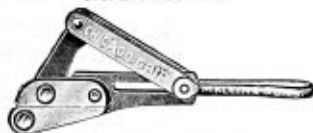


FIG. 4025

No. 1612 Series with Pulleys



FIG. 4026

No. 1613-20.	For No. 10 wire and smaller	list price, each	\$ 5.60
No. 1613-30.	For No. 6 wire and smaller	list price, each	6.10
No. 1613-40.	For No. 0 wire and smaller	list price, each	9.00
No. 1613-50.	For No. 0000 wire and smaller	list price, each	13.00
No. 1612-20.	For No. 10 wire and smaller, for $\frac{1}{4}$ in. rope	list price, each	7.50
No. 1612-30.	For No. 6 wire and smaller, for $\frac{3}{8}$ in. rope	list price, each	8.00
No. 1612-40.	For No. 0 wire and smaller, for $\frac{1}{2}$ in. rope	list price, each	10.00
No. 1612-50.	For No. 0000 wire and smaller, for $\frac{5}{8}$ in. rope	list price, each	13.80

"CHICAGO" GRIPS FOR INSULATED WIRE

No. 1611 Series



FIG. 4027

No. 1610 Series, with Pulleys



FIG. 4028

No. 1611-10.	For No. 10 wire and smaller	list price, each	\$ 7.50
No. 1611-20.	For No. 4 wire and smaller	list price, each	8.00
No. 1611-30.	For No. 00 wire and smaller	list price, each	9.80
No. 1611-40.	For No. 0000 wire and smaller	list price, each	14.70
No. 1626-39.	For 250,000 C. M. aluminum cable	list price, each	14.80
No. 1626-40.	For 500,000 C. M. aluminum cable	list price, each	14.80
No. 1610-10.	For No. 10 wire and smaller, for $\frac{1}{4}$ in. rope	list price, each	8.00
No. 1610-20.	For No. 4 wire and smaller, for $\frac{3}{8}$ in. rope	list price, each	8.90
No. 1610-30.	For No. 00 wire and smaller, for $\frac{1}{2}$ in. rope	list price, each	10.80
No. 1610-40.	For No. 0000 wire and smaller, for $\frac{5}{8}$ in. rope	list price, each	15.60

"QUICK" SAMSON GRIP

For Strand or Messenger Wire



FIG. 4029

No. 1618-20.	For $\frac{1}{8}$ to $\frac{3}{8}$ in. dia., grip- ping surface 7 in.	list price, each	\$21.00
No. 1618-30.	For $\frac{1}{4}$ to $\frac{1}{2}$ in. dia., grip- ping surface 7 in.	list price, each	25.00
No. 1618-40.	For $\frac{1}{2}$ to $\frac{5}{8}$ in. dia., grip- ping surface 9 in.	list price, each	28.00

KLEIN'S LINEMEN'S TOOLS

HAVEN'S STEEL GRIP



FIG. 4030

A popular grip for all 'round work. Forged from crucible tool steel, hardened and tempered. Almost automatic in action. The handle and the eccentric allows instantaneous hold. A shake of the rope on the tackle disengages or releases the grip. It will not slip, heavy strain only making it grip the tighter.

No. 1604-10.	No. 8 wire and finer.....	List price, each	\$ 4.00
No. 1604-20.	$\frac{1}{2}$ inch wire and finer.....	List price, each	5.50
No. 1625-20.	No. 6 to $\frac{3}{4}$ wire.....	List price, each	13.00

SELF-LOCKING LINEMEN'S SLACK TACKLE



FIG. 4031

Consists of light steel shell blocks, fitted with a snubbing hook to lock load in any position. This is a great convenience and time-saver for the man on the pole. Also in handling a vertical load.

No. 1801-20. List price..per set \$6.30

LINEMEN'S BLOCK WITH STRAP



FIG. 4032

This block has a light steel galvanized shell, wood rollers bushed with metal. The forward block has a locking device for holding the load at variable distances. The outer end of each block has an eye for attaching a grip.

No. 4904-12. With 12 feet of strap. List price.....per set \$10.50

TREE TRIMMERS



No. 3600-20

FIG. 4033



No. 3600-21

FIG. 4034

No. 3600-20.	Size 19 inches over all, without saw.....	List Price each,	\$5.50
No. 3600-21.	Size 21 inches over all, with saw.....	List price each,	7.50

TREE TRIMMER SAW

No. 913-12.	12-inch for No. 3600-20 Trimmer.....	List price each,	\$2.00
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TREE TRIMMER HANDLES

3603-8.	16 ft., 2 piece.....	List price each,	\$3.80
3603-16.	16 ft., 1 piece.....	List price each,	2.30
3601-9.	18 ft., 2 piece.....	List price each,	4.30
3601-18.	18 ft., 1 piece.....	List price each,	2.70

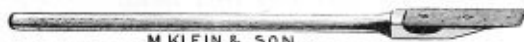
No. 3603-8 is composed of two 8-foot handles joined with ferrule in center.

No. 3603-16 is of one-piece construction.

No. 3601-9 is composed of two 9-foot handles joined with ferrule in center.

No. 3601-18 is of one-piece construction.

KLEIN'S LINEMEN'S TOOLS LOY DIGGING TOOL



M. KLEIN & SON

FIG. 4035

No. 3703-18. Size, 8-foot, 4x $\frac{3}{4}$ inch shoe, weight each, 18 lbs...List price each, \$7.30

For digging holes in hard soil, constructed of heavy steel. Blade with sharp hardened cutting edge, securely riveted to select hardwood handle.

SPUD DIGGING TOOL AND TAMPING BAR



FIG. 4036

No. 3702-9. Size, 9-foot, Weight each, 19 lbs.....List price each, \$8.50

Handle of steel tubing. Steel blade riveted to handle.

THE "ELECTRIC" TAMPING BAR

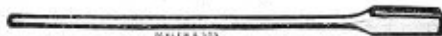


FIG. 4037

No. 3801-3. 8-foot, weight 18 $\frac{1}{2}$ lbs.....List price each, \$6.30

The handle is made of steel tubing. The tamping shoes of malleable iron securely fastened to the handle.

TAMPING BAR Wood Handle, Heavy Iron Shoe



M. KLEIN & SON

FIG. 4038

No. 3800-7. 7-foot, weight 12 $\frac{1}{2}$ lbs.....List price, each, \$4.30

No. 3800-8. 8-foot, weight 13 $\frac{1}{2}$ lbs.....List price, each, 4.60

Tamping end shod with 1 $\frac{1}{4}$ x $\frac{5}{8}$ -inch steel shoe riveted through select hardwood handle. A high-grade tamping bar.

TAKE-UP REEL

For taking up wire in heavy construction work.

List Price

No. 4608-3. For 18-inch coil, single crank...each, \$33.00

No. 4608-4. For 21-inch coil, single crank...each, 33.00

No. 4608-3. For 18-inch coil, double crank...each, 41.20

No. 4608-4. For 21-inch coil, double crank...each, 41.20

CABLE REEL JACK

A pair of these jacks will support cable reels of any size while the cable is being run off. The forked head will hold a 2 $\frac{1}{2}$ -inch diameter shaft, and will swivel to any position. The cable may be raised or lowered while it is supported on the jacks. The screw is operated by inserting a bar into the holes in the head of the screw.

These jacks are fitted with 2x16-inch locomotive jack screws, braced on oak bases.

No. 4700-1.List price each, \$38.00

No. 4700-2. Same as No. 4700-1, but with ratchet operated screwList price each, 55.00



FIG. 4039



FIG. 4040

KLEIN'S LINEMEN'S TOOLS

COMMON PAY-OUT REEL



FIG. 4041

No. 4600-1. Weight each, 40 lbs.....each, \$13.70

Substantially built of hard wood and reinforced with steel plates. A good reel for the repair wagon.

We also furnish reel spools with turnpin and disk, without base, for wagon reels or for multiple stringing. Guard Pins are adjustable for 12-inch, 18-inch or 24-inch Coils.

PAY-OUT LIGHT REEL—FOR TELEPHONE WORK ON BARROW



FIG. 4042

No. 4601-1. Weight, 80 lbs.....each, \$23.00

Constructed of hard wood and reinforced with steel plates. The barrow is supported by substantially made steel legs side braced and bolted through the wood. Built to stand hard usage. Guard Pins are adjustable for 12-inch, 18-inch or 24-inch Coils.

HEAVY REEL—FOR ELECTRIC LIGHT WORK

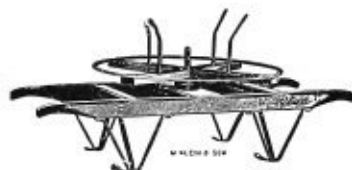


FIG. 4043

No. 4601-2. Weight, 90 lbs.....each, \$27.50

All wood parts are made of oak mortised and bolted together and reinforced with steel plates. Carried on strong, well braced legs bolted through the wood. The guard pins are adjustable for 12-inch, 18-inch or 24-inch Coils. Built to stand hard usage.

THE "WASSON" REEL



FIG. 4044

No. 4607-1. For 14, 20 and 25-inch Coils, weight 90 lbs.each, \$41.50

No. 4607-2. Same as above, except has 2 spools, weight 129 lbs.each, 57.50

This reel and cart is made of steel and is strong and light and always ready; it carries its own tools as well as pins, insulators and other material; has brake to keep the wire from running away; can be anchored to the ground. Is used by telephone and electric light companies.

TROLLEY MATERIALS

TYPE S M HANGER, FORM 1

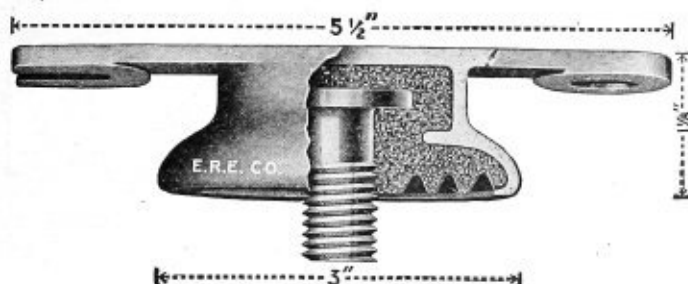


FIG. 4045

An exceptionally short hanger, which requires minimum head room, and is recommended for mines having low roofs. Designed for attachment to mine timbers by means of two lag screws.

Type S M Hanger, Form 1, Japanned, $\frac{5}{8}$ -inch stud.....per 100, \$69.00
 Type S M Hanger, Form 1, Galvanized, $\frac{5}{8}$ -inch studper 100, 69.00

TYPE S M HANGER, FORM 2

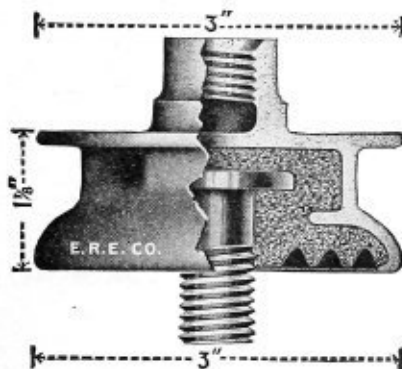


FIG. 4046

This hanger has same general dimensions as Form 1, Type S M Hanger, but is designed for direct attachment to mine roof by means of expansion bolt.

Type S M Hanger, Form 2, Japanned, $\frac{5}{8}$ -inch stud.....per 100, \$69.00
 Type S M Hanger, Form 2, Galvanized, $\frac{5}{8}$ -inch stud.....per 100, 69.00

TROLLEY MATERIALS

TYPE L F HANGER—FORM 1

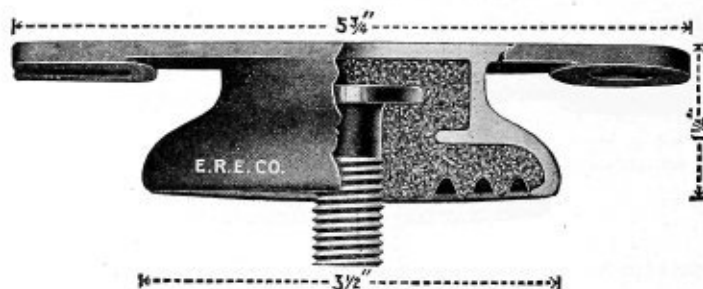


FIG. 4047

The above hanger was designed especially for mines using 500 volt trolley service and is also recommended for use where atmospheric conditions are bad, as the three petticoats and large diameter of hanger provide ample creepage surface against current leakage.

Type L F Hanger, Form 1, Japanned, $\frac{5}{8}$ -inch stud.....per 100, \$77.90

Type L F Hanger, Form 1, Galvanized, $\frac{5}{8}$ -inch stud.....per 100, 77.00

TYPE L F HANGER—FORM 2

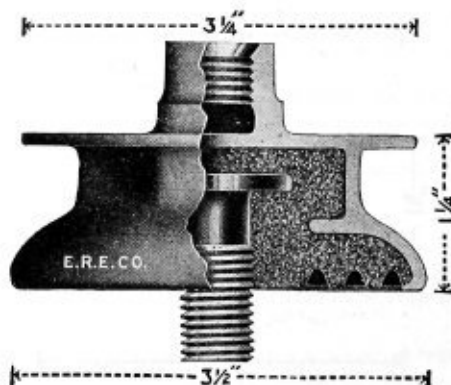


FIG. 4048

The above hanger has a diameter at lower edge of $3\frac{1}{2}$ inches, and when installed, extends below mine roof only $1\frac{1}{4}$ inches. Exposed insulation is moulded with three petticoats to secure maximum creepage surface across the face.

Type L F Hanger, Form 2, Japanned, $\frac{5}{8}$ -inch stud.....Per 100, \$77.00

Type L F Hanger, Form 2, Galvanized, $\frac{5}{8}$ -inch stud.....per 100, 77.00

TROLLEY MATERIALS

TYPE L F HANGER, FORM 5

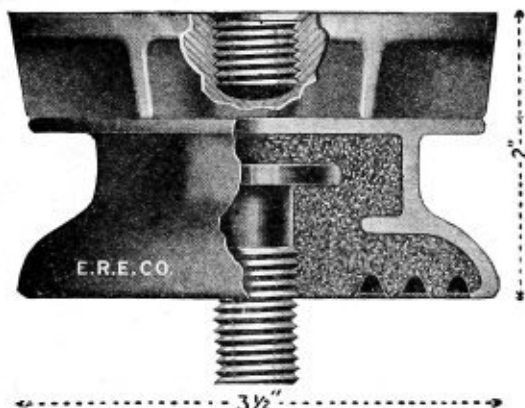


FIG. 4049

Type L F Hanger, Form 5, Japanned, $\frac{5}{8}$ -inch stud.....per 100, \$89.70
 Type L F Hanger, Form 5, Galvanized, $\frac{5}{8}$ -inch stud.....per 100, 89.70

Type L F Form 5 Hangers are so designed that they can be used equally well for direct attachment to mine roof, or to roof timber, making it necessary to stock only one style of hanger.

Use Type "A" Expansion Bolt, or Special Lag Screw and Wood Plug, when hangers are to be attached to mine roof.

For attaching hanger to roof timber, use Special Lag Screw only.

MINE HANGER, TYPE "Z"



FIG. 4050

Mine Hanger, Type "Z" Japanned, $\frac{5}{8}$ -inch stud.....per 100, \$75.00
 Mine Hanger, Type "Z" Galvanized, $\frac{5}{8}$ -inch stud.....per 100, 75.00

This hanger is arranged for direct attachment to the mine roof by means of expansion bolt.

Diameter at lower edge, $3\frac{1}{4}$ inches.

TROLLEY MATERIALS
TYPE BD HANGER, FORM 1



FIG. 4051

This mine hanger is designed for attachment to mine timbers by means of two $\frac{1}{2}$ -inch lag screws. Exposed insulation is moulded with a deep gutter instead of petticoats. Bolt lugs are arranged, one with slot, the other with $\frac{1}{8}$ -inch hole.

Type B D Hanger, Form 1, Japanned, $\frac{5}{8}$ -inch studper 100, \$89.50

Type B D Hanger, Form 1, Galvanized, $\frac{5}{8}$ -inch stud.....per 100, 89.50

TYPE BD HANGER, FORM 2



FIG. 4052

This hanger is similar to one described above, but designed for direct attachment to mine roof by means of Type "A" Expansion Bolt, or Special Lag Screw and Wood Plug, as boss is tapped for $\frac{5}{8}$ -inch bolt.

Type B D Hanger, Form 2, Japanned, $\frac{5}{8}$ -inch studper 100, \$89.50

Type B D Hanger, Form 2, Galvanized, $\frac{5}{8}$ -inch studper 100, 89.50

TROLLEY MATERIALS

EXPANSION BOLT, TYPE A



FIG. 4053

This Expansion Bolt is adapted for use with any hanger having boss tapped for $\frac{5}{8}$ -inch bolt.

Expansion Bolt, Type A, length 4 inches, Black	per 100, \$35.00
Expansion Bolt, Type A, length 4 inches, Galvanized	per 100, 35.00
Expansion Bolt, Type A, length 6 inches, Black	per 100, 45.50
Expansion Bolt, Type A, length 6 inches, Galvanized	per 100, 45.50

SPECIAL LAG SCREW AND WOOD PLUG

For Supporting Mine Hangers



FIG. 4054



FIG. 4055

The Special Lag Screw and Wood Plug illustrated above are recommended for use with any Form 2 Hangers listed, all of which are designed for direct attachment to mine roof. Can also be used to advantage for attaching Form 5 or Combination Mine Hangers direct to mine roof.

For supporting any Form 5 or Combination Type Mine Hanger from mine timber, Special Lag Screw only is required.

Wood Plug, size $1\frac{1}{2} \times 3$ inches	per 100, \$ 5.50
Special Lag Screw, $\frac{5}{8} \times 4$ inches, Black	per 100, 12.00
Special Lag Screw, $\frac{5}{8} \times 4$ inches, Galvanized	per 100, 12.00

TROLLEY MATERIALS

MINE HANGER, TYPE "E"



FIG. 4056

Mine Hanger, Type "E," Japanned, $\frac{5}{8}$ -inch stud.....per 100, \$75.00
 Mine Hanger, Type "E," Galvanized, $\frac{5}{8}$ -inch stud.....per 100, 75.00

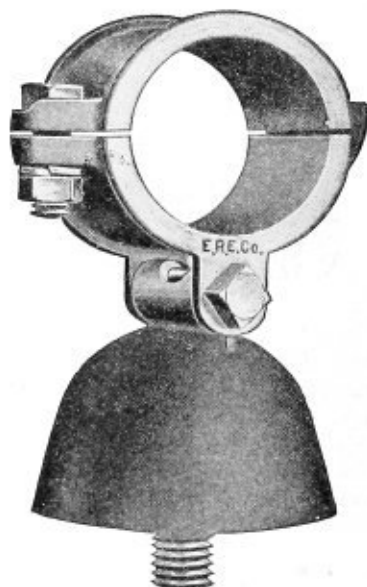


FIG. 4057

SWIVEL PIPE BRACKET HANGER
TYPE "E"

This hanger is adapted for use with pipe brackets. The clamp can be furnished for $1\frac{1}{4}$, $1\frac{1}{2}$ and 2-inch pipe. When ordering, specify size of pipe on which they are to be used.

Hanger, Type "E," Japanned, $\frac{5}{8}$ -inch stud.....per 100, \$140.00
 Hanger, Type "E," Galvanized, $\frac{5}{8}$ -inch stud.....per 100, 140.00

TROLLEY MATERIALS
MINE HANGER TYPE "A"



FIG. 4058

This hanger is arranged for attachment to cross timbers in mine or bridge work and is unusually strong, being provided for the reception of four lag screws.

Mine Hanger, Japanned, $\frac{5}{8}$ -inch stud.....	per 100, \$99.00
Mine Hanger, Galvanized, $\frac{5}{8}$ -inch stud.....	per 100, 99.00

MINE SUSPENSION TYPE "A-B"



FIG. 4059

Mine Suspension, Japanned, $\frac{5}{8}$ -inch stud.....	per 100, \$100.00
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TROLLEY MATERIALS

SINGLE CURVE PULL-OVER TYPE "G"

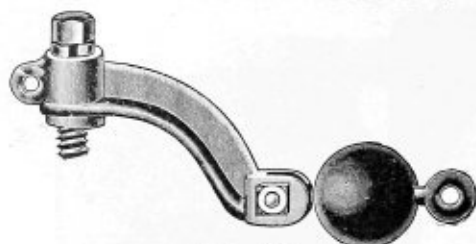


FIG. 4060

Single Curve Pull-Over, Japanned, $\frac{5}{8}$ -inch stud.....	per 100, \$92.50
Single Curve Pull-Over, Galvanized, $\frac{5}{8}$ -inch stud.....	per 100, 92.50

DOUBLE CURVE PULL-OVER TYPE "G"



FIG. 4061

Double Curve Pull-Over, Japanned, $\frac{5}{8}$ -inch stud.....	per 100, \$167.50
Double Curve Pull-Over, Galvanized, $\frac{5}{8}$ -inch stud	per 100, 167.50

SINGLE CURVE PULL-OVER TYPE "Q"



FIG. 4062

Single Curve Pull-Over, Japanned, $\frac{5}{8}$ -inch stud.....	per 100, \$82.50
Single Curve Pull-Over, Galvanized, $\frac{5}{8}$ -inch stud	per 100, 82.50

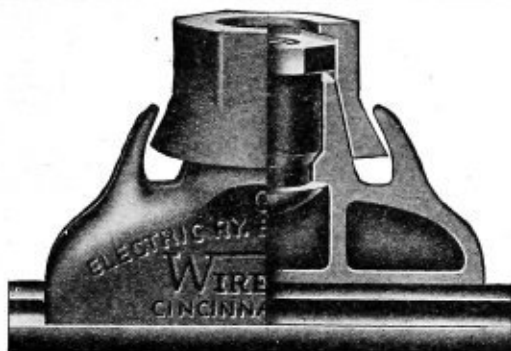
DOUBLE CURVE PULL-OVER TYPE "Q"



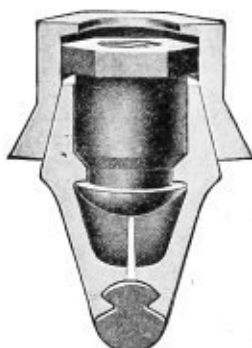
FIG. 4063

Double Curve Pull-Over, Japanned, $\frac{5}{8}$ -inch stud.....	per 100, \$147.50
Double Curve Pull-Over, Galvanized, $\frac{5}{8}$ -inch stud.....	per 100, 147.50

TROLLEY MATERIALS "WIRE LOCK" TROLLEY CLAMP



Sectional View



End View

FIG. 4064

The "Wire Lock" Clamp shown above has a length of 3 inches, and a height of only 2 inches. This clamp has a total of only four parts which are securely locked together by means of small lugs as shown. The clamp requires only one operation to install and lock trolley wire in place, as the grip of the jaws on the trolley wire is automatically secured by forcing hexagon nut tight against hanger face. No preliminary adjustment is necessary before installing this clamp, and there are no exposed threads to corrode and prevent clamp from being used over the second time.

End view shows narrow jaws which provide ample clearance for trolley wheel. "Wire Lock" Clamps are for use with any standard mine hanger having $\frac{3}{8}$ -inch stud.

FOR ROUND, FIGURE 8, OR GROOVED WIRE



FIG. 4065

Clamp, Malleable Iron, Galvanized, for 1-0 Round Wire.....	per 100,	\$45.00
Clamp, Malleable Iron, Galvanized, for 2-0 Round Wire.....	per 100,	45.00
Clamp, Malleable Iron, Galvanized, for 3-0 Round Wire.....	per 100,	45.00
Clamp, Malleable Iron, Galvanized, for 4-0 Round Wire.....	per 100,	45.00
Clamp, Malleable Iron, Galvanized, for Figure 8 Wire.....	per 100,	45.00
Clamp, Malleable Iron, Galvanized, for Grooved Wire.....	per 100,	45.00

TROLLEY MATERIALS

"SURE GRIP" TROLLEY CLAMP FOR ROUND, FIGURE 8,
AND GROOVED WIRE



FIG. 4066

GALVANIZED MALLEABLE
IRON CLAMPS

For 1-0 Round Wire.....	per 100, \$55.00
For 2-0 Round Wire.....	per 100, 55.00
For 3-0 Round Wire.....	per 100, 55.00
For 4-0 Round Wire.....	per 100, 55.00
For 1-0 to 4-0 Figure 8 Wire.....	per 100, 55.00
For 1-0 to 4-0 Grooved Wire.....	per 100, 55.00

BRONZE METAL CLAMPS

Per 100	\$116.00
Per 100	116.00
Per 100	116.00
Per 100	116.00
Per 100	116.00
Per 100	116.00

Above clamps all tapped for $\frac{5}{8}$ -inch
stud.

"SURE GRIP" FEEDER CLAMP



FIG. 4067

This clamp is similar to clamp shown above, differing in being provided with feeder lug.

Clamp, Bronze Metal, for 1-0 B&S Round Wire.....	per 100, \$150.00
Clamp, Bronze Metal, for 2-0 B&S Round Wire.....	per 100, 150.00
Clamp, Bronze Metal, for 3-0 B&S Round Wire.....	per 100, 150.00
Clamp, Bronze Metal, for 4-0 B&S Round Wire.....	per 100, 150.00
Clamp, Bronze Metal, for 1-0, 2-0, 3-0 and 4-0 Figure 8 Wire.....	per 100, 150.00
Clamp, Bronze Metal, for 1-0, 2-0, 3-0 and 4-0 Grooved Wire.....	per 100, 150.00

TROLLEY MATERIALS

THREE-SCREW CLAMP FOR ROUND, FIGURE 8, OR GROOVED WIRE

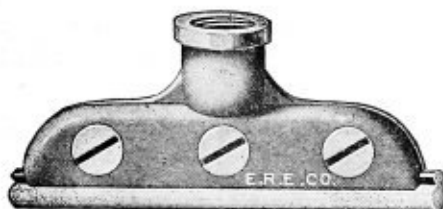


FIG. 4068

This clamp is made of either Malleable Iron or Bronze as required. Length, 5 inches. Tapped for $\frac{3}{8}$ -inch stud.

Bronze Metal Clamp for No. 1-0 Round Wire.....	per 100, \$62.50
Bronze Metal Clamp for No. 2-0 Round Wire.....	per 100, 62.50
Bronze Metal Clamp for No. 3-0 Round Wire.....	per 100, 62.50
Bronze Metal Clamp for No. 4-0 Round Wire.....	per 100, 62.50
Bronze Metal Clamp for Grooved Wire.....	per 100, 62.50
Bronze Metal Clamp for Figure 8 Wire.....	per 100, 62.50
Malleable Iron Galvanized Clamp for Grooved Wire.....	per 100, 32.50
Malleable Iron Galvanized Clamp for Figure 8 Wire.....	per 100, 32.50

FOUR-SCREW CLAMP FOR ROUND, FIGURE 8, OR GROOVED WIRE



FIG. 4069

Similar to clamp described above. Length, 8 inches.

Bronze Metal Clamp for No. 1-0 Round Wire.....	per 100, \$90.00
Bronze Metal Clamp for No. 2-0 Round Wire.....	per 100, 90.00
Bronze Metal Clamp for No. 3-0 Round Wire.....	per 100, 90.00
Bronze Metal Clamp for No. 4-0 Round Wire.....	per 100, 90.00
Bronze Metal Clamp for Grooved Wire.....	per 100, 90.00
Bronze Metal Clamp for Figure 8 Wire.....	per 100, 90.00
Malleable Iron Galvanized Clamp for Grooved Wire.....	per 100, 40.00
Malleable Iron Galvanized Clamp for Figure 8 Wire.....	per 100, 40.00

TROLLEY MATERIALS

CLINCH TROLLEY EAR FOR ROUND WIRE



FIG. 4070

The Clinch Ear for round wire illustrated above is similar to our Solder Ear for round wire, with the exception that the groove in this case is made of sufficient depth to allow the lips of the Ear to almost encircle the wire, and is not tinned for soldering.

Ear for No. 0 Round Wire, $\frac{5}{8}$ -inch stud. Length 9 inches.....	each, \$0.33
Ear for No. 2-0 Round Wire, $\frac{5}{8}$ -inch stud. Length 9 inches.....	each, .34
Ear for No. 0 Round Wire, $\frac{5}{8}$ -inch stud. Length 12 inches.....	each, .42
Ear for No. 0 Round Wire, $\frac{3}{4}$ -inch stud. Length 12 inches.....	each, .47
Ear for No. 2-0 Round Wire, $\frac{5}{8}$ -inch stud. Length 12 inches.....	each, .42
Ear for No. 2-0 Round Wire, $\frac{3}{4}$ -inch stud. Length 12 inches.....	each, .47
Ear for No. 3-0 Round Wire, $\frac{5}{8}$ -inch stud. Length 12 inches.....	each, .43
Ear for No. 3-0 Round Wire, $\frac{3}{4}$ -inch stud. Length 12 inches.....	each, .48
Ear for No. 0 Round Wire, $\frac{5}{8}$ -inch stud. Length 15 inches.....	each, .50
Ear for No. 0 Round Wire, $\frac{3}{4}$ -inch stud. Length 15 inches.....	each, .55
Ear for No. 2-0 Round Wire, $\frac{5}{8}$ -inch stud. Length 15 inches.....	each, .51
Ear for No. 2-0 Round Wire, $\frac{3}{4}$ -inch stud. Length 15 inches.....	each, .56
Ear for No. 3-0 Round Wire, $\frac{5}{8}$ -inch stud. Length 15 inches.....	each, .58
Ear for No. 3-0 Round Wire, $\frac{3}{4}$ -inch stud. Length 15 inches.....	each, .63
Ear for No. 4-0 Round Wire, $\frac{5}{8}$ -inch stud. Length 15 inches.....	each, .61
Ear for No. 4-0 Round Wire, $\frac{3}{4}$ -inch stud. Length 15 inches.....	each, .66

CLINCH ANCHOR EAR FOR ROUND, GROOVED, OR FIGURE 8 WIRE

The Clinch Anchor Ear here shown is made to fit Round, Grooved, or Figure 8 wire. It is tinned for soldering if so ordered. Length over all, 11 inches.



FIG. 4071

Anchor Ear for No. 0 Round Wire.....	per 100, \$55.00
Anchor Ear for No. 2-0 Round Wire.....	per 100, 55.00
Anchor Ear for No. 3-0 Round Wire.....	per 100, 62.50
Anchor Ear for No. 4-0 Round Wire.....	per 100, 62.50
Anchor Ear for No. 2-0 Grooved Wire.....	per 100, 55.00
Anchor Ear for No. 3-0 Grooved Wire.....	per 100, 62.50
Anchor Ear for No. 4-0 Grooved Wire.....	per 100, 62.50
Anchor Ear for No. 0 Figure 8 Wire.....	per 100, 55.00
Anchor Ear for No. 2-0 Figure 8 Wire.....	per 100, 55.00
Anchor Ear for No. 3-0 Figure 8 Wire.....	per 100, 62.50
Anchor Ear for No. 4-0 Figure 8 Wire.....	per 100, 62.50

TROLLEY MATERIALS

BRONZE ANCHOR CLAMP FOR FIGURE 8 OR GROOVED WIRE



FIG. 4072

Bronze Anchor Clamp for No. 2-0 Grooved Wire.....	per 100,	\$115.00
Bronze Anchor Clamp for No. 3-0 Grooved Wire.....	per 100,	115.00
Bronze Anchor Clamp for No. 4-0 Grooved Wire.....	per 100,	115.00
Bronze Anchor Clamp for No. 0 Figure 8 Wire.....	per 100,	115.00
Bronze Anchor Clamp for No. 2-0 Figure 8 Wire.....	per 100,	115.00
Bronze Anchor Clamp for No. 3-0 Figure 8 Wire.....	per 100,	115.00
Bronze Anchor Clamp for No. 4-0 Figure 8 Wire.....	per 100,	115.00

CLARK SPLICING EAR WITHOUT BOSS



FIG. 4073

Bronze—Length, 10 inches.

Splicing Ear for 1-0 and 2-0 Round and Grooved Wire.....	per 100,	\$170.00
Splicing Ear for 3-0 Round and Grooved Wire.....	per 100,	180.00
Splicing Ear for 4-0 Round and Grooved Wire.....	per 100,	200.00
Splicing Ear for 1-0 and 2-0 Figure 8 Wire.....	per 100,	187.00
Splicing Ear for 3-0 and 4-0 Figure 8 Wire.....	per 100,	216.00

CLARK SPLICING EAR WITH BOSS



FIG. 4074

Bronze—Length, 10 inches.

Splicing Ear for 1-0 and 2-0 Round and Grooved Wire.....	per 100,	\$210.00
Splicing Ear for 3-0 and 4-0 Round and Grooved Wire.....	per 100,	230.00
Splicing Ear for 1-0 and 2-0 Figure 8 Wire.....	per 100,	218.00
Splicing Ear for 3-0 and 4-0 Figure 8 Wire.....	per 100,	244.00

Tapped for 5/8-inch stud.

TROLLEY MATERIALS

CLARK SPLICING EAR WITHOUT BOSS
FOR FIGURE 8 WIRE

FIG. 4075

Bronze—Length, 15 inches.

Splicing Ear for No. 0 Figure 8 Wire.....	per 100, \$125.00
Splicing Ear for No. 2-0 Figure 8 Wire.....	per 100, 125.00
Splicing Ear for No. 3-0 Figure 8 Wire.....	per 100, 150.00
Splicing Ear for No. 4-0 Figure 8 Wire.....	per 100, 175.00

CLARK SPLICING EAR WITH BOSS
FOR FIGURE 8 WIRE

FIG. 4076

Bronze—Length, 15 inches.

Splicing Ear for No. 0 Figure 8 Wire, $\frac{5}{8}$ -inch stud.....	per 100, \$100.00
Splicing Ear for No. 2-0 Figure 8 Wire, $\frac{5}{8}$ -inch stud.....	per 100, 100.00
Splicing Ear for No. 3-0 Figure 8 Wire, $\frac{5}{8}$ -inch stud.....	per 100, 125.00
Splicing Ear for No. 4-0 Figure 8 Wire, $\frac{5}{8}$ -inch stud.....	per 100, 125.00

CLINCH SPLICING EAR
FOR ROUND OR GROOVED WIRE.

FIG. 4077

Bronze, with Set Screws—Length, 15 inches.

Splicing Ear for No. 0 Round Wire, $\frac{5}{8}$ -inch stud.....	per 100, \$125.00
Splicing Ear for No. 2-0 Round Wire, $\frac{5}{8}$ -inch stud.....	per 100, 125.00
Splicing Ear for No. 3-0 Round Wire, $\frac{5}{8}$ -inch stud.....	per 100, 150.00
Splicing Ear for No. 4-0 Round Wire, $\frac{5}{8}$ -inch stud.....	per 100, 175.00
Splicing Ear for No. 2-0 Grooved Wire, $\frac{5}{8}$ -inch stud.....	per 100, 125.00
Splicing Ear for No. 3-0 Grooved Wire, $\frac{5}{8}$ -inch stud.....	per 100, 150.00
Splicing Ear for No. 4-0 Grooved Wire, $\frac{5}{8}$ -inch stud.....	per 100, 175.00

TROLLEY MATERIALS

K-I TROLLEY WIRE SPLICER FOR ROUND OR GROOVED WIRE



FIG. 4078

Splicing Tube for No. 0 Round Wire.....	per 100, \$100.00
Splicing Tube for No. 2-0 Round Wire.....	per 100, 100.00
Splicing Tube for No. 3-0 Round Wire.....	per 100, 110.00
Splicing Tube for No. 4-0 Round Wire.....	per 100, 120.00
Splicing Tube for No. 2-0 Grooved Wire.....	per 100, 110.00
Splicing Tube for No. 3-0 Grooved Wire.....	per 100, 120.00
Splicing Tube for No. 4-0 Grooved Wire.....	per 100, 130.00

K-I TROLLEY WIRE SPLICER FOR FIGURE 8 WIRE



FIG. 4079

Splicing Tube for No. 0 Figure 8 Wire.....	per 100, \$100.00
Splicing Tube for No. 2-0 Figure 8 Wire.....	per 100, 100.00
Splicing Tube for No. 3-0 Figure 8 Wire.....	per 100, 110.00
Splicing Tube for No. 4-0 Figure 8 Wire.....	per 100, 120.00
Wedges for Splicers	per 100, 6.00

SPlicing TUBE FOR ROUND OR GROOVED WIRE, TYPE "A"



FIG. 4080

In the Splicing Tube illustrated above the ends of the trolley wire are spliced together by soldering them in the splicing tube. These tubes are made of cold drawn brass, and are drilled to the proper size at each end and left with solid center. There are two slots for the admission of solder.

Splicer, 10x $\frac{3}{8}$ -inch, for No. 0 Round Wire.....	per 100, \$ 87.50
Splicer, 15x $\frac{3}{8}$ -inch, for No. 0 Round Wire.....	per 100, 112.50
Splicer, 18x $\frac{1}{2}$ -inch, for No. 0 Round Wire.....	per 100, 150.00
Splicer, 10x $\frac{3}{8}$ -inch, for No. 2-0 Round Wire.....	per 100, 87.50
Splicer, 16x $\frac{3}{8}$ -inch, for No. 2-0 Round Wire.....	per 100, 112.50
Splicer, 18x $\frac{1}{2}$ -inch, for No. 2-0 Round Wire.....	per 100, 150.00
Splicer, 11x $\frac{3}{4}$ -inch, for No. 3-0 Round Wire.....	per 100, 125.00
Splicer, 18x $\frac{3}{4}$ -inch, for No. 3-0 Round Wire.....	per 100, 175.00
Splicer, 18x $\frac{7}{8}$ -inch, for No. 3-0 Round Wire.....	per 100, 212.50
Splicer, 12x $\frac{7}{8}$ -inch, for No. 4-0 Round Wire.....	per 100, 162.50
Splicer, 20x $\frac{7}{8}$ -inch, for No. 4-0 Round Wire.....	per 100, 225.00
Splicer, 11x $\frac{3}{4}$ -inch, for No. 2-0 Grooved Wire.....	per 100, 123.00
Splicer, 18x $\frac{3}{4}$ -inch, for No. 2-0 Grooved Wire.....	per 100, 175.00
Splicer, 18x $\frac{7}{8}$ -inch, for No. 2-0 Grooved Wire.....	per 100, 212.50
Splicer, 12x $\frac{7}{8}$ -inch, for No. 3-0 Grooved Wire.....	per 100, 162.50
Splicer, 20x $\frac{7}{8}$ -inch, for No. 3-0 Grooved Wire.....	per 100, 225.00
Splicer, 12x $\frac{7}{8}$ -inch, for No. 4-0 Grooved Wire.....	per 100, 162.50
Splicer, 20x $\frac{7}{8}$ -inch, for No. 4-0 Grooved Wire.....	per 100, 225.00



FIG. 4081

TROLLEY MATERIALS

BRONZE TROLLEY WHEEL BUSHINGS
GRAPHITE FILLED

	Per 100
Bushing, $\frac{1}{2}$ -inch inside diameter, $\frac{7}{8}$ -inch outside diameter, $1\frac{1}{2}$ inches long..	\$32.00
Bushing, $\frac{3}{8}$ -inch inside diameter, 1-inch outside diameter, $1\frac{1}{2}$ inches long..	34.00
Bushing, $\frac{1}{2}$ -inch inside diameter, $\frac{7}{8}$ -inch outside diameter, $1\frac{3}{8}$ inches long..	36.00
Bushing, $\frac{3}{4}$ -inch inside diameter, $1\frac{1}{8}$ -inch outside diameter, 3 inches long..	70.00
Bushing, $\frac{5}{8}$ -inch inside diameter, 1-inch outside diameter, 2 inches long..	40.00
Bushing, 1-inch inside diameter, $1\frac{3}{8}$ -inch outside diameter, $1\frac{1}{2}$ inches long..	42.00
Bushing, $\frac{3}{4}$ -inch inside diameter, $1\frac{1}{2}$ -inch outside diameter, 2 inches long..	50.00

TROLLEY WHEELS

All Trolley Wheels listed are made from the highest grade Bronze and are guaranteed to give good service and long life without damaging the trolley wire. Each wheel is furnished complete with genuine graphite filled bushing and in ordinary service no oil is required.

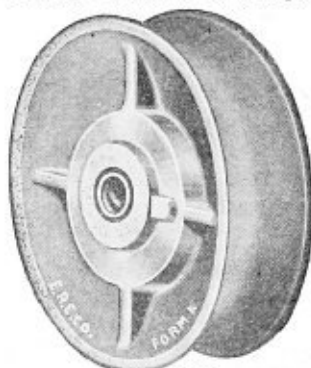


FIG. 4082



FIG. 4083

Form "J" Trolley Wheel, 4-inch diameter; bushing, $\frac{1}{2} \times 1\frac{1}{2}$ inches.....each, \$2.20
Form "A" Trolley Wheel, 4-inch diameter; bushing, $\frac{1}{2} \times 1\frac{1}{2}$ inches.....each, 2.50

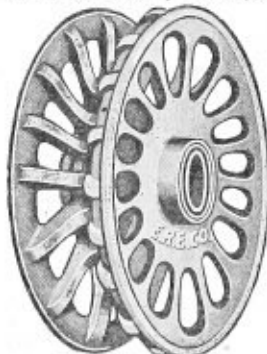


FIG. 4084

STEEL TROLLEY WHEEL

4-inch diameter; bushing, $\frac{1}{2} \times 1\frac{1}{2}$ inches..each,	\$2.10
4-inch diameter; bushing, $\frac{5}{8} \times 1\frac{1}{2}$ inches..each,	2.20
6-inch diameter; bushing, $\frac{1}{2} \times 1\frac{1}{2}$ inches..each,	4.50
6-inch diameter; bushing, $\frac{5}{8} \times 1\frac{1}{2}$ inches..each,	4.60

TROLLEY MATERIALS

"ELRECO" TROLLEY HARP
MALLEABLE IRON

FIG. 4085

The "Elreco" Trolley Harp illustrated here combines all the desirable features of the old Type "A" Harp and several improvements, making it the ideal harp for mine service.

Provision has been made to take up all wear between harp and pole socket, without necessity of adding washers. To make this adjustment, it is only necessary to remove cotter pin from machine bolt, turn hexagon (slotted end) nut one-sixth of a turn or more, replace cotter pin. This adjustment insures a good bearing at all times between harp and socket, preventing excessive wear at this point, and can be made, as occasion demands, until harp is discarded.

Feeder wire lug is of ample capacity to accommodate 4-0 stranded cable, and is tapped on side for two (2) $\frac{1}{8}$ -inch screws.

Rib on pole socket prevents harp from fouling on mine timbers when wheel leaves wire.

Harp may be used with any 4-inch or $4\frac{1}{4}$ -inch trolley wheel having $\frac{1}{2} \times 1\frac{1}{2}$ -inch bushing. Special harp furnished for 6-inch wheel.

"Elreco" Trolley Harp complete, Malleable Iron.....price each, \$5.50

For list of parts used with above Harp, see following page.

TROLLEY MATERIALS

"ELRECO" TROLLEY HARP PARTS

See Cut on Preceding Page Also.



FIG. 4086

Malleable Iron Pole Socket with set of two Screws for feeder lug.....each,	\$3.00
Malleable Iron Harp only.....each,	2.00
$\frac{1}{2}$ -inch Axle only with set of two Cotter Pins.....each,	.16
$\frac{5}{8}$ -inch Bolt, 18 threads per inch.....each,	.30
Copper Wearing Washer.....each,	.08
$\frac{5}{8}$ -inch Special Nut, 18 threads per inch.....each,	.10
Cotter Pin for bolt No. 7475.....each,	.01
Bronze Harp for 6-inch wheel, special.....each,	3.50

TROLLEY MATERIALS
MIAMI TYPE SECTION INSULATOR
FOR ROUND, GROOVED, AND FIGURE 8 WIRE
END CASTINGS, BRONZE

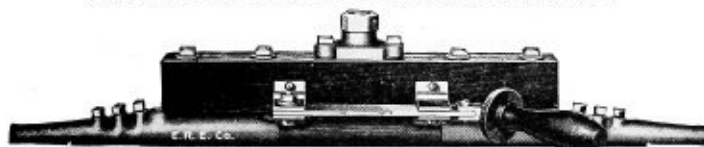
**FIG. 4087**

Over-all length of insulator, 26 inches; size of wood block, 1 $\frac{3}{4}$ inches by 2 inches. Bronze end castings with feeder lugs drilled for either 2-0 or 4-0 wire. Renewable wood runner piece.

Top of insulator provided with tapped boss which is rotated by means of hexagon nut, permitting insulator to be attached to any mine hanger or $\frac{5}{8}$ -inch expansion bolt already in position.

Section Insulator, for No. 1-0 Round Wire.....	each, \$10.90
Section Insulator, for No. 2-0 Round Wire.....	each, 10.90
Section Insulator, for No. 3-0 Round Wire.....	each, 10.90
Section Insulator, for No. 4-0 Round Wire.....	each, 10.90
Section Insulator, for No. 2-0 Grooved Wire.....	each, 10.90
Section Insulator, for No. 3-0 Grooved Wire.....	each, 10.90
Section Insulator, for No. 4-0 Grooved Wire.....	each, 10.90
Section Insulator, for No. 1-0 Figure 8 Wire.....	each, 10.90
Section Insulator, for No. 2-0 Figure 8 Wire.....	each, 10.90
Section Insulator, for No. 3-0 Figure 8 Wire.....	each, 10.90
Section Insulator, for No. 4-0 Figure 8 Wire.....	each, 10.90

MIAMI TYPE SECTION INSULATOR WITH SWITCH
FOR ROUND, GROOVED, AND FIGURE 8 WIRE

**FIG. 4088**

Similar in design to Section Insulator described above, having knife switch mounted on side. Wood block is treated with oil and is not affected by moisture in mines. Rotating boss permits insulator to be attached to solid stud mine hanger without removing hanger from mine roof. Copper switch blade and lugs have current carrying capacity equal to 4-0 wire. This device should be installed on all branch trolley circuits in mine, as it permits the current being cut off trolley wire where locomotive is not operating.

Section Insulator with Switch, for No. 1-0 Round Wire	each, \$16.00
Section Insulator with Switch, for No. 2-0 Round Wire	each, 16.00
Section Insulator with Switch, for No. 3-0 Round Wire	each, 16.00
Section Insulator with Switch, for No. 4-0 Round Wire	each, 16.00
Section Insulator with Switch, for No. 2-0 Grooved Wire	each, 16.00
Section Insulator with Switch, for No. 3-0 Grooved Wire	each, 16.00
Section Insulator with Switch, for No. 4-0 Grooved Wire	each, 16.00
Section Insulator with Switch, for No. 1-0 Figure 8 Wire.....	each, 16.00
Section Insulator with Switch, for No. 2-0 Figure 8 Wire.....	each, 16.00
Section Insulator with Switch, for No. 3-0 Figure 8 Wire.....	each, 16.00
Section Insulator with Switch, for No. 4-0 Figure 8 Wire.....	each, 16.00

TROLLEY MATERIALS

TROLLEY FROGS WITH TWO PULL-OFF RINGS



FIG. 4089

	Price Each
R. H. Frog, 20° Angle, for Nos. 0 to 3-0 Round, Fig. 8 and Grooved wires...	\$ 7.50
L. H. Frog, 20° Angle, for Nos. 0 to 3-0 Round, Fig. 8 and Grooved wires...	7.50
V Frog, 20° Angle, for Nos. 0 to 3-0 Round, Figure 8 and Grooved wires...	7.50
R. H. Frog, 20° Angle, for Nos. 4-0 Round, Figure 8 and Grooved wires...	10.00
L. H. Frog, 20° Angle, for Nos. 4-0 Round, Figure 8 and Grooved wires...	10.00
V Frog, 20° Angle, for No. 4-0 Round, Figure 8 and Grooved wires.....	10.00
R. H. Frog, 15° Angle, for Nos. 0 to 4-0 Round, Fig. 8 and Grooved wires...	10.00
L. H. Frog, 15° Angle, for Nos. 0 to 4-0 Round, Fig. 8 and Grooved wires...	10.00
V Frog, 15° Angle, for Nos. 0 to 4-0 Round, Figure 8 and Grooved wires...	10.00
R. H. Frog, 8° Angle, for Nos. 0 to 4-0 Round, Fig. 8 and Grooved wires.....	15.00
L. H. Frog, 8° Angle, for Nos. 0 to 4-0 Round, Fig. 8 and Grooved wires.....	15.00
V Frog, 8° Angle, for Nos. 0 to 4-0 Round, Figure 8 and Grooved Wires....	15.00

The above frogs can be supplied with four pull-off rings when so ordered.

NON-INSULATED CROSS-OVER
BRONZE-ADJUSTABLE-TYPE "O"

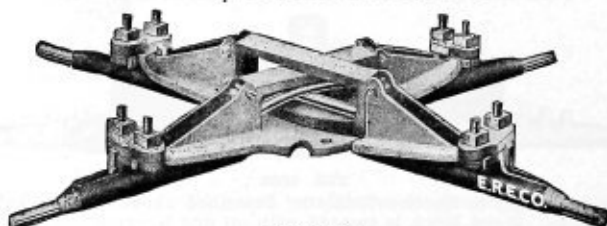


FIG. 4090

The Non-Insulated Cross-over shown is adjustable for trolley wires crossing at angles of 60 to 90 degrees, and the design is such that it is not necessary either wire be cut when installing cross-over.

Non-Insulated Cross-Over, for No. 1-0 Round Wire	each	\$15.20
Non-Insulated Cross-Over, for No. 2-0 Round Wire	each	15.20
Non-Insulated Cross-Over, for No. 3-0 Round Wire	each	15.20
Non-Insulated Cross-Over, for No. 4-0 Round Wire	each	15.20
Non-Insulated Cross-Over, for No. 2-0 Grooved Wire	each	15.20
Non-Insulated Cross-Over, for No. 3-0 Grooved Wire	each	15.20
Non-Insulated Cross-Over, for No. 4-0 Grooved Wire	each	15.20
Non-Insulated Cross-Over, for No. 1-0 Figure 8 Wire	each	15.20
Non-Insulated Cross-Over, for No. 2-0 Figure 8 Wire	each	15.20
Non-Insulated Cross-Over, for No. 3-0 Figure 8 Wire	each	15.20
Non-Insulated Cross-Over, for No. 4-0 Figure 8 Wire	each	15.20

TROLLEY MATERIALS

"ECLIPSE" BONDING SLEEVES

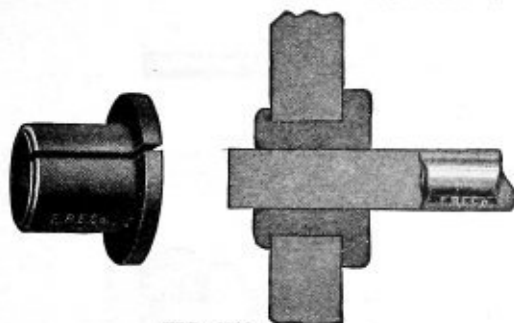


FIG. 4091

After the Sleeve is in position the Upsetting Tool is applied to the tapered end of it to form a head or shoulder against the rail. A hole is provided in the end of this tool to give clearance to the projecting end of the bond wire.

To properly install these sleeves a set of three special tools is required: Drift Punch, Driving and Upsetting Tools. The Drift Punch is intended to remove any burrs around the edge of the hole in the rail which may be left by the drill.—It is driven lightly into the hole from the same side that the Bonding Sleeve is to enter. The Sleeve is then inserted in the rail and driven home by means of the Driving Tool. One end of the latter is slotted to allow it to clear the bond wire.



FIG. 4092



FIG. 4093

Drift Punch



FIG. 4094

Driving Tool



FIG. 4095

Upsetting Tool



FIG. 4096

"ECLIPSE" BONDING SLEEVES

Size of Bonding Wire B. & S. Gage	Diam. of Sleeve	Diam. of Hole in Rail	Price per 1000
No. 4-0	$\frac{3}{32}$ in.	$\frac{3}{16}$ in.	\$121.50
No. 2-0	$\frac{1}{16}$ in.	$\frac{5}{16}$ in.	101.00
No. 2-0	$\frac{1}{16}$ in.	$\frac{7}{16}$ in.	86.00
No. 0	$\frac{3}{16}$ in.	$\frac{5}{8}$ in.	107.85
No. 0	$\frac{3}{16}$ in.	$\frac{7}{8}$ in.	95.00

Sleeves to fit rails already drilled, furnished to order.

$\frac{1}{32}$ of an inch is allowed for a driving fit.

CHANNEL PINS

These Pins are tapered on one end, and are slightly larger than the hole in the rail, so that when seated they compress tightly on the wire and make a firm, solid joint.

Size of Bonding Wire B. & S. Gage	Diam. of Pin	Diam. of Hole in Rail	Price per 1000
No. 6	$\frac{1}{16}$ in.	$\frac{3}{16}$ in.	\$25.00
No. 4	$\frac{3}{16}$ in.	$\frac{1}{4}$ in.	25.00
No. 2	$\frac{1}{4}$ in.	$\frac{1}{4}$ in.	25.00
No. 0	$\frac{3}{8}$ in.	$\frac{3}{8}$ in.	25.00
No. 2-0	$\frac{1}{2}$ in.	$\frac{1}{2}$ in.	25.00
No. 2-0	$\frac{5}{8}$ in.	$\frac{5}{8}$ in.	25.00
No. 2-0	$\frac{3}{4}$ in.	$\frac{3}{4}$ in.	32.50
No. 4-0	$\frac{3}{8}$ in.	$\frac{3}{4}$ in.	32.50

"ECLIPSE" BONDING SLEEVE TOOLS

	Price Each
Drift Punch	\$2.60
Driving Tool	3.95
Upsetting Tool	2.60

TROLLEY MATERIALS WEDGE GRIP



FIG. 4097

Wedge action gives a secure grip on wire although it may be released by a few blows on outer end of wedges. Opening in clevis, $\frac{1}{2}$ inch; diameter of clevis bolt, $\frac{5}{8}$ inch. Will take 0 to 4-0 Round or Grooved wire or $\frac{1}{4}$ to $\frac{1}{2}$ -inch strand.
Wedge Grip, Malleable Iron, Galvanized.....Per 100 \$55.00

INSULATED EYEBOLT, TYPE "B"



FIG. 4098

Eyebolt, $\frac{1}{2}$ x 12 inches, Plain Porcelain Break	Per 100	\$56.25
Eyebolt, $\frac{1}{2}$ x 12 inches, Galvanized Porcelain Break	Per 100	62.50
Eyebolt, $\frac{3}{8}$ x 12 inches, Plain Porcelain Break	Per 100	62.50
Eyebolt, $\frac{3}{8}$ x 12 inches, Galvanized Porcelain Break	Per 100	68.75
Eyebolt, $\frac{1}{2}$ x 12 inches, Plain Ereco Break	Per 100	81.25
Eyebolt, $\frac{1}{2}$ x 12 inches, Galvanized Ereco Break	Per 100	87.50
Eyebolt, $\frac{3}{8}$ x 12 inches, Plain Ereco Break	Per 100	87.50
Eyebolt, $\frac{3}{8}$ x 12 inches, Galvanized Ereco Break	Per 100	93.75

INSULATED TURNBUCKLE WITH INSULATED EYEBOLT, TYPE "C"



FIG. 4099

Turnbuckle, 6-inch opening, $\frac{1}{2}$ -inch Eyebolts, Plain	Per 100	\$137.50
Turnbuckle, 6-inch opening, $\frac{1}{2}$ -inch Eyebolts, Galvanized	Per 100	150.00
Turnbuckle, 6-inch opening, $\frac{3}{8}$ -inch Eyebolts, Plain	Per 100	162.50
Turnbuckle, 6-inch opening, $\frac{3}{8}$ -inch Eyebolts, Galvanized	Per 100	175.00

INSULATED TURNBUCKLE WITH BROOKLYN STRAIN, TYPE "D"



FIG. 4100

Turnbuckle, Bronze Brooklyn Strain, Regular	Per 100	\$275.00
Turnbuckle, Malleable Iron Brooklyn Strain	Per 100	190.00
Turnbuckle, Bronze Brooklyn Strain, Extra Heavy	Per 100	475.00
Turnbuckle, Malleable Iron Brooklyn Strain, Extra Heavy	Per 100	290.00

INSULATED TURNBUCKLE WITH ERECO SPOOLS, TYPE "E"

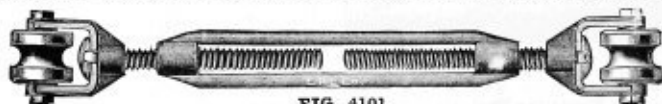


FIG. 4101

Turnbuckle, 9-inch opening, $\frac{1}{2}$ -inch Bolts, Plain	Per 100	\$137.50
Turnbuckle, 9-inch opening, $\frac{1}{2}$ -inch Bolts, Galvanized	Per 100	150.00
Turnbuckle, 9-inch opening, $\frac{3}{8}$ -inch Bolts, Plain	Per 100	162.50
Turnbuckle, 9-inch opening, $\frac{3}{8}$ -inch Bolts, Galvanized	Per 100	175.00
Turnbuckle, 12-inch opening, $\frac{5}{8}$ -inch Bolts, Plain	Per 100	200.00
Turnbuckle, 12-inch opening, $\frac{5}{8}$ -inch Bolts, Galvanized	Per 100	220.00

TROLLEY BRACKETS**MINE BRACKET NO. 49**

For Wood Poles

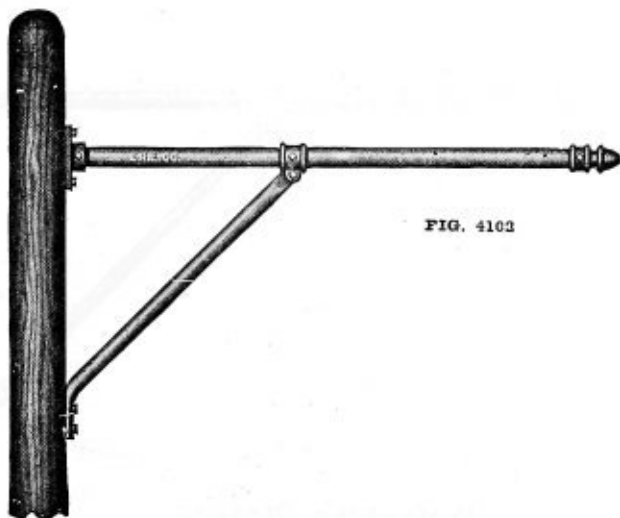


FIG. 4102

**PLAIN ARM WITH STRUT
STANDARD BRACKET**

- 3-foot arm, 1½-inch standard pipe.
- 4-foot arm, 1½-inch standard pipe.
- 5-foot arm, 1½-inch standard pipe.
- 6-foot arm, 1½-inch standard pipe.

PEERLESS BRACKET

- 3-foot arm, 1½-inch "C" tubing.
- 4-foot arm, 1½-inch "C" tubing.
- 5-foot arm, 1½-inch "C" tubing.
- 6-foot arm, 1½-inch "C" tubing.

Prices on application.

TROLLEY BRACKETS

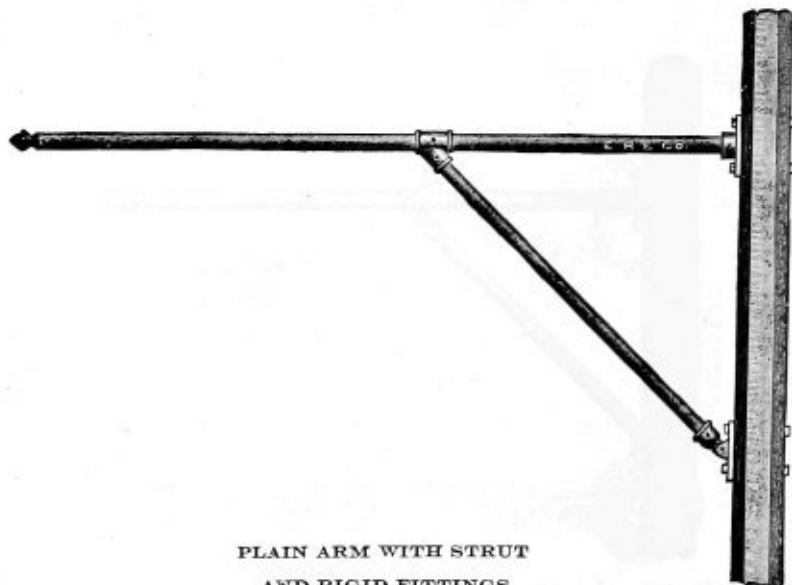
SINGLE BRACKET NO. 50
FOR WOOD POLES

FIG. 4103

PLAIN ARM WITH STRUT
AND RIGID FITTINGS
STANDARD BRACKET

- 7-foot arm, 1½-inch standard pipe.
- 8-foot arm, 1½-inch standard pipe.
- 9-foot arm, 1½-inch standard pipe.
- 10-foot arm, 1½-inch standard pipe.
- 7-foot arm, 2-inch standard pipe.
- 8-foot arm, 2-inch standard pipe.
- 9-foot arm, 2-inch standard pipe.
- 10-foot arm, 2-inch standard pipe.

PEERLESS BRACKET

- 7-foot arm, 1½-inch "C" tubing.
- 8-foot arm, 1½-inch "C" tubing.
- 9-foot arm, 1½-inch "C" tubing.
- 10-foot arm, 1½-inch "C" tubing.
- 7-foot arm, 2-inch "C" tubing.
- 8-foot arm, 2-inch "C" tubing.
- 9-foot arm, 2-inch "C" tubing.
- 10-foot arm, 2-inch "C" tubing.

Prices on application.

HARDSOEG IMPERIAL ROOF AUGER

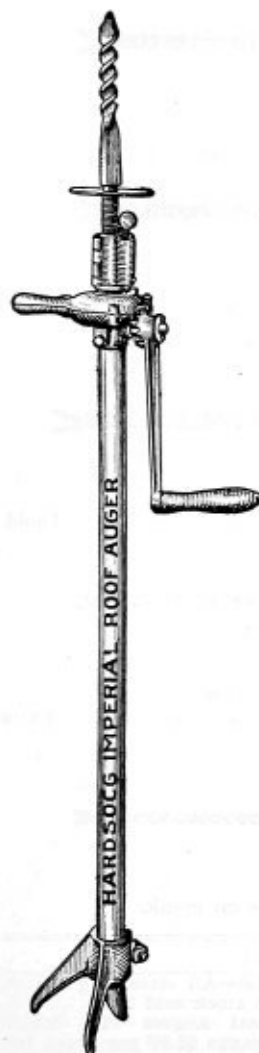


FIG. 4104

This machine is designed for special work in drilling the roof in mines for insulator plugs, etc. It is exceptionally strong and efficient and has all the latest improvements.

LIST OF MACHINE AND PARTS

Imperial Roof Auger complete, with 6 in. and 12 in. bits	\$12.00
1E Crank combined with small cog.....	1.25
2E Upper Half of Housing.....	1.25
3E Lower Half of Housing.....	1.75
4E Crow Foot for bottom post.....	1.50
6E Malleable Boxing	1.50
7E Pipe for post.....	1.50
8E Feed Bar, reversible, 1½ in. diameter...	2.50
9E Large cog	1.25
10E Complete Housing for Gear.....	3.00
11E Bit 6 inches long.....	.60
12E Bit 12 inches long.....	.75
13E Bit 18 inches long.....	1.10
14E Bit 24 inches long.....	1.50
15E Bolts for Housing.....each	.10
121 Tail Screw for Crow Foot.....	.15

Always be sure to specify minimum height of roof of mine when ordering to get the correct height post. Posts are made any height from 3 to 10 feet.

Weight of machine complete, 45 lbs.

BREAST AUGERS NO. 1 SOLID PIECE

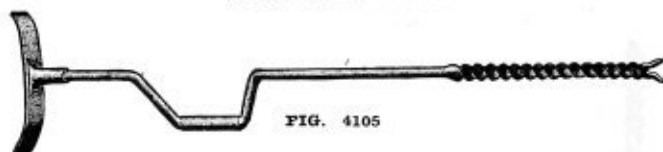


FIG. 4105

NO. 2—SQUARE SOCKET CONNECTION AUGER

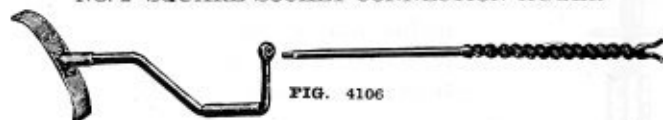


FIG. 4106

"CALIFORNIA" OR UNION SCREW COUPLING AUGER



FIG. 4107

NO. 3—CRUCIBLE STEEL

Same as No. 4, except it *does not* have the ferrules on crank, each end of hand hold



FIG. 4108

THE GREAT NO. 4 PATENT AUGER

Exclusively "HARDSOG" Patent Plate Socket and Frictionless Crank. Extra Fine Steel.

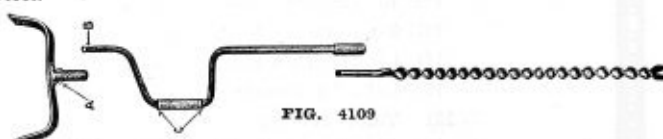


FIG. 4109

NOTE—Collars "C" welded at each end of ferrule on crank.

	3-Ft. Twist	4-Ft. Twist	6-Ft. Twist	
No. 1	\$28.00	29.50	35.00	Twist—All sizes, 2 qualities, in stock sold by lb. Breast Augers with double cranks \$3.50 per dozen net extra.
No. 2	28.00	29.50	35.00	
California or Union.	28.00	29.50	35.00	
No. 3	28.00	29.50	35.00	
No. 4	29.50	33.00	36.50	

HARDSOEG A G L POST DRILL

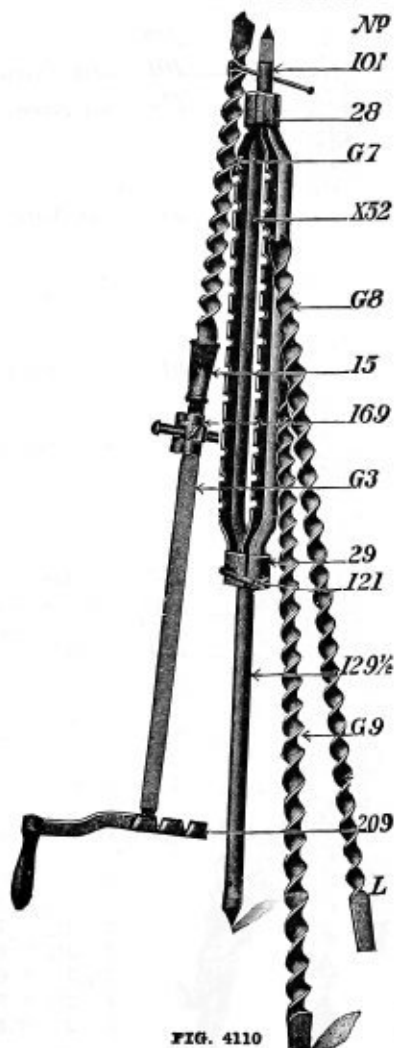


FIG. 4110

Jack Screw.....\$0.65

Jack Screw Casting..... .85

Two-Foot Augers..... 1.10

Corrugated Side Bar..... .80

Four-Foot Auger..... 2.15

Improved Auger Socket.... .45

Patent Boxing..... .90

Thread Bar, 1 1/8 inches..... 2.15

Extension Casting..... .95

Tail Set Screw..... .20

Extension Stem, 1 1/4 in..... 1.00

Six-foot Auger..... 3.20

Improved Crank..... 1.10

Steel Post Complete:

No. 2. 5 to 7 feet long..\$5.50

No. 3. 4 to 6 feet long.. 5.25

No. 3 1/2. 3 to 5 feet long.. 4.75

No. 4. 2 to 4 feet long.. 4.75

A. G. L. Drills complete with 2, 4 and 6-foot augers.....\$11.00
 A. G. L. Drills complete with 2 and 4-foot augers..... 9.50

Conveyor Twist, 1 1/2-inch feather edge or 1 1/4 x 3/8-inch square edge augers furnished on A. G. L. Machines at above list prices.

When ordering A. G. L. Drills, always specify height of post, lengths and kind of augers and thread desired.

HARDSOGG "Q" & "E.Z.Q." HEAVY COAL DRILLS

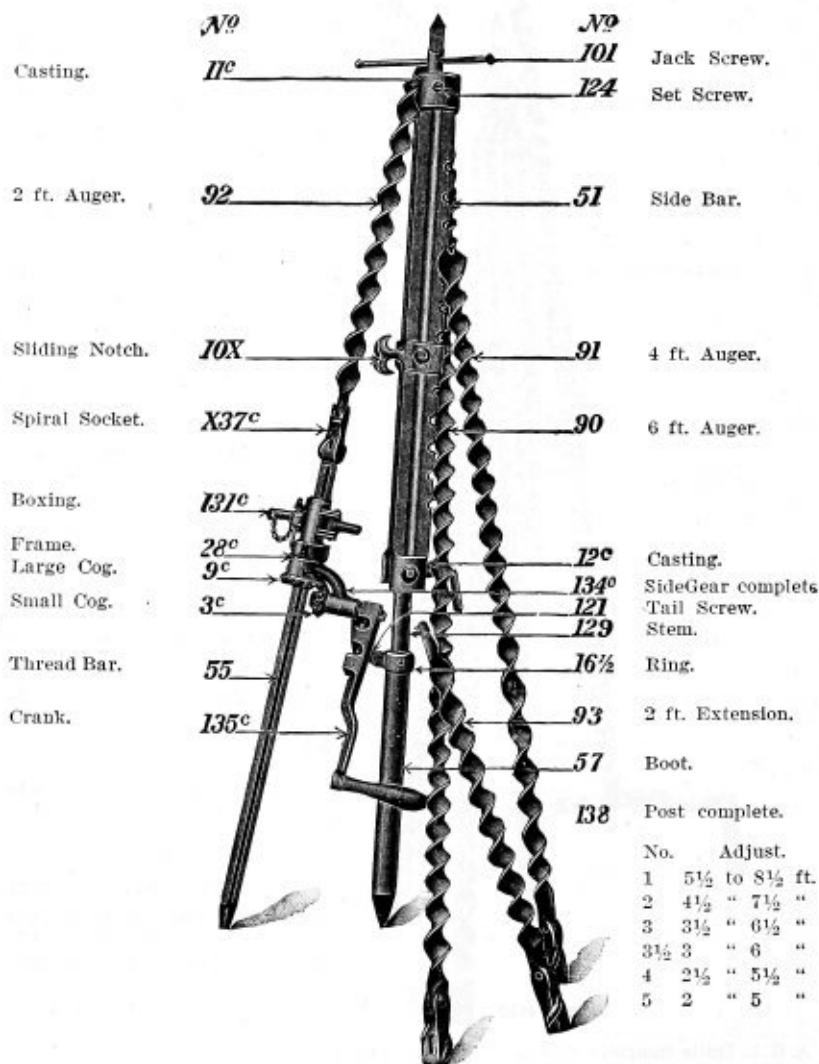


FIG. 4111

HARDSOEG "Q" & "E. Z. Q" HEAVY COAL DRILLS CONTINUED

PARTS

List Each		Q SIDE GEAR PARTS	
No.	Description	No.	Description
No. 54	Thread Bar for End Gear not slotted .....\$2.25	No. 55	Thread Bar for Side Gear slotted .....\$2.50
No. 37B	Boxing for End Gear.... 1.00	No. 131C	Boxing for Side Gear.... 1.00
No. 92	Two-foot Auger 1½" FE 1.15	No. 134C	Gearing 3.20
No. 91	Four-foot " 1½" FE 2.30	No. 28C	Frame (Babbitted) 1.50
No. 90	Six-foot " 1½" FE 3.45	No. 9C	Large Cog (Machined)... 1.00
	Two-foot " 1¾" FE 1.30	No. 3C	Small Cog ..... .50
	Four-foot " 1¾" FE 2.60	No. 115	Journal ..... .50
	Six-foot " 1¾" FE 3.90		
No. 135C	Cranks ..... .85	E Z Q SIDE GEAR PARTS	
No. 11C	Casting for Jack Screw.. 1.00	No. 155	Thread Bar (Slotted)...\$2.50
No. 12C	Casting for Stem..... 1.00	No. 234C	Gearing 3.00
No. 101	Jack Screw ..... .65	No. 231C	Boxing 1.00
No. 129	Stem 2 ft. long 1¼" dia.. 1.00		
No. 57	Boot 20" long 1.00		
No. 121	Tail Screw ..... .20		
No. 124	Set Screw ..... .15		
No. 16½	Ring for Boot..... .20		
No. X37C	Socket for Augers..... .50		

Q AND QEZ MACHINES (LIST PRICES)

Complete With 1½-inch Feather Edge Augers

For Machines with 1½-inch or 1¾-inch Augers, add to list with 2-ft. 4-ft. and 6-ft. Augers, \$0.90.

	No. 1	No. 2	No. 3	No. 3½	No. 4
End Gear with 2, 4 and 6 ft. Augers.....	\$14.60	14.00	13.50	13.25	13.00
End Gear with 2 and 4 ft. Augers.....	12.60	12.00	11.50	11.25	11.00
Side Gear with 2, 4, and 6 ft. Augers.....	16.60	16.00	15.50	15.25	15.00
Side Gear with 2 and 4 ft. Augers.....	14.60	14.00	13.50	13.25	13.00
Posts only	8.00	7.20	6.40	6.00	5.60

HARDSOGG'S ROCK RATCHET MACHINE

FOR ROCK AND ALL HARD BORING

Low price, wonderfully efficient, if handled properly.
Simple, strong.

No coal mine complete without it.

Specially good in extra hard fire clay mines.

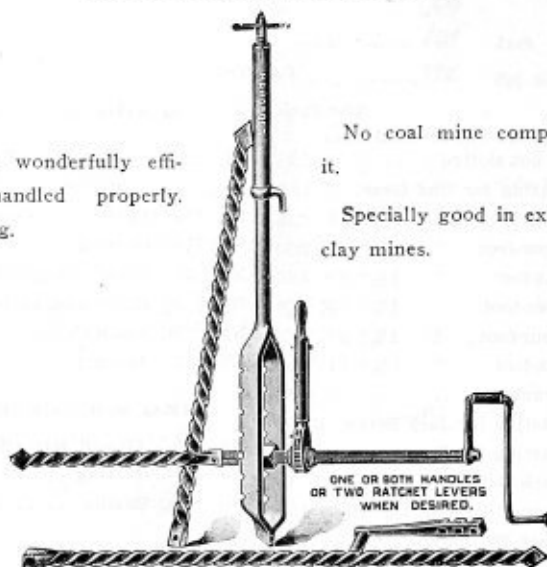


FIG. 4112

Machine to drill 4 feet, having 2 and 4-foot augers.....	\$18.40
Same, with 1, 2, 3 and 4-foot augers.....	21.00
To drill 4½ feet, with 1½, 3 and 4½-foot augers.....	21.00
To drill 6 feet, with 2, 4 and 6-foot augers.....	22.00

Either 1½x½ square edge augers, or 1½ bevel edge augers of finest crucible tool steel possible to buy for the purpose.

Without ratchet deduct from list	\$ 1.50
Any length special rock augers, flat or bevel; list per foot.....	.80

ROCK MACHINE REPAIRS

Order by Numbers.

55 Thread bar, 10, 12 and 14 threads	\$2.15	254 Universal ratchet	\$2.15
37B Boxing 10, 12 and 14 threads	.90	255 Double handle	1.30
101 Jack screw	.50	135C Single crank	.60
4 Special boot	1.30	Cog for ratchet.....	.45
17 Ring for boot.....	.15	Lug or catch for ratchet..	.15
		Spring for ratchet.....	.15
		Rock post, complete.....	6.50

HOWELLS HEAVY GEARED POST DRILL FOR COAL AND ROCK



FIG. 4113

This machine has been designed to meet the demand for a strong hand-power drill, where air or electric current is not available, for drilling rock, slate, fire-clay, shale, gypsum, plaster rock and soapstone, that can be drilled with a steel auger; also for drilling long holes up to 100 feet in proving coal or tapping for water or gas in advance of working. It is built very strong throughout to stand the power of two or four men turning the cranks.

The feed screw is one and three-eighths inches in diameter, four feet long, and is provided with an automatic ball-bearing device that will feed the drill bit forward from 6 to 1000 revolutions per inch. A valuable device when drilling through stratum having hard and soft material.

The steel gear is made strong and fitted with two cranks to withstand the power of two or four men.

The feed or thread boxing is made of the best grade of phosphor bronze.

The post is fitted with a heavy steel jack screw and is adjustable to two feet and made any length to suit the thickness of the vein.

Machine as illustrated is equipped with cog gear. In addition to the two cranks, we furnish ratchet handles which slide over the feed screw. These handles will be found useful in drilling close to the top, bottom and sides where the crank handles could not be used.

Complete machine with post up to 6 feet, one set of augers, 2-feet,	
4-feet and 6-feet	\$50.00
No. 2 Ratchet handles with $1\frac{1}{8}$ hole.....	each 3.50
Post over 6 feet.....	per foot 1.50
Augers, $1\frac{1}{4} \times \frac{1}{2}$ inch, flat.....	per foot 1.00
Augers, $1\frac{1}{2} \times \frac{1}{2}$ inch, flat.....	per foot 1.20

WHEN ORDERING: State height of vein, diameter and depth of hole, also material to be drilled. This information will enable us to make a machine suitable to your requirements.

SPRY TYPE "SS" ELECTRIC DRILL



FIG. 4114

Direct drive with gears enclosed.

After eight years of experimenting, we have placed the Spry Electric Drills upon the market. These drills have proven their ability to do excellent work under even adverse conditions and are no small factors in the effort to reduce operating cost.

In their construction, no means have been spared to make these drills as perfect as possible. Unusual precautions have been taken to make them so simple yet so strong that they are absolutely fool-proof and practically indestructible. They can be taken apart and put together again in less than five minutes, and are the simplest, most powerful and compact drills of their type.

Points of Advantage about the Spry Electric Drills.

1. Weight of motor and gears but 115 pounds.
2. Motor carries 300 per cent. overload for short intervals and 500 per cent. momentarily.
3. Starts at full load one and a half normal current.
4. Armature works at 400 degrees without burning out.
5. No wire connections on taking frame apart.
6. Positively under control—to operate, simply turn a handle.
7. Overheating eliminated—ventilated armature and poles.
8. Wrong connection with reverse rotation impossible.

The Spry Electric Drills are reputed to be the most economical of their type, as with no cumbersome starting box, working parts reduced to a minimum, built for excessive overload and the simplicity of construction, the Spry Drills reach the highest efficiency obtainable, delivering the greatest power possible at the drilling point without sacrifice of power or endurance.

SPRY TYPE "SS" ELECTRIC DRILL

SUITABLE FOR EITHER SINGLE OR DOUBLE COLUMN

Gear guard removed showing compound gears disengaged

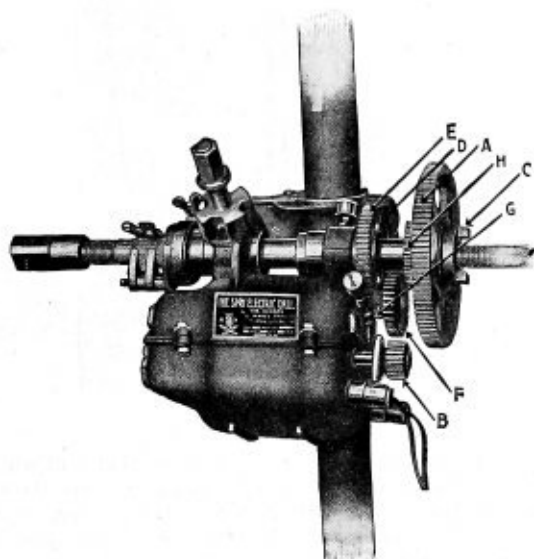


FIG. 4115

These drills are built from 110 to 500 volts direct or alternating current, made for either single or double column or both. No alteration to frame necessary to change from single to double column mountings. All bearings fitted with lubricating devices.

The drills can be readily converted into a direct drive machine, with greater speed, by simply taking off the gear guard (not illustrated); remove the large gear wheel and reverse it, then placing it onto the shaft. This will disengage the gear wheel on the shaft and make the drill operated by direct drive.

Where material of a hard nature is encountered in mining, the compound gear is recommended, which reduces the speed of the drill without sacrifice of power. The ball-bearing feed device advances the drill bit forward from 6 to 1,000 revolutions per inch. All of the latest improvements have been embodied in these machines so as to keep pace with mine development. Holes can be drilled close to top, bottom and both sides of the chamber and cleaned out and bit removed while drill is in operation.

Complete machine, any size column, either single or double, 25 feet of standard cable with connectors, drill steel up to 6 feet of grade and temper to suit the requirements, as shown on preceding page	\$365.00
Complete machine, equipped with compound gear, as above.....	415.00

THE CHICAGO COAL DRILL NO. 3B

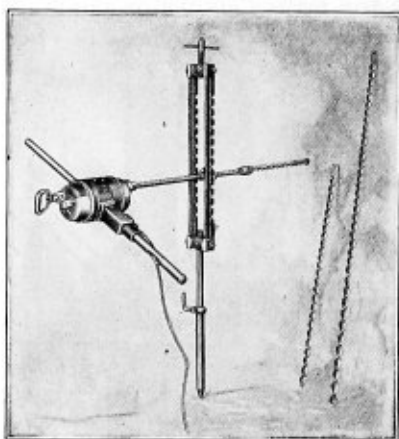


FIG. 4116

To the mine using electricity the No. 3B Chicago coal drill will appeal more particularly. It is carried in stock wound for 120 and 240 volts direct current, and for 120 and 240 volts, alternating current, two or three phase, 60 cycles. If requested the 60 cycle, two or three phase alternating current coal drills, can be furnished for 440 volts at a slightly higher price.

No. 3B Chicago Coal Drill, Non-Reversible, mounted on drill frame, complete with 15-ft. electrical conductor and set of 2, 4 and 6-ft. augers, with spade handle and chuck to take square taper shank or flat taper shank augers, as the case may be.....\$255.00
Coal boring breast plate for above, \$5.00 extra.

No. 3B Chicago Coal Drill, complete with 15-ft. electrical conductor and breast plate, but without drill frame or augers, in Non-Reversible type, with chuck to take square taper shank or flat taper shank augers, as the case may be..... 230.00

The above can be furnished Reversible at an extra cost of \$15.00 per tool.

Power consumption. Approximate energy consumption, 800 watts.

When ordering the No. 3B Chicago Coal Drill, please specify whether it is to be furnished mounted on drill frame complete with 15 ft. electrical conductor and a set of 2, 4 and 6-foot augers, total weight 120 lbs., or complete with 15-foot electrical conductor and breast plate only.

"SYLAT" POST PULLERS

(Patented in the United States and Great Britain)

The invention of a practical miner—made to solve the many difficulties continually met with.

With the "Sylat" props are removed from a distance with a steady pull that minimizes the danger of disturbing unsound roof.

Men stand well away from the falling roof, which is let down as gently as possible. They not only pull the prop but drag it away without once entering the danger zone.

The "Sylat" is simplicity itself to operate. It quickly earns a salary by the high percentage of timbers recovered—90 per cent in one West Virginia mine.

Your mine can be profitably equipped with "Sylat" Post Pullers. When not pulling post there's most a dozen other jobs ready for them.



FIG. 4117

"SYLATS" PULL—

Props.

Rails from under falls.

Derailled cars and

Locomotives—back on track.

Old boiler tubes.

No. 1 Machine with 36-inch rack-bar and 15 ft. of $\frac{3}{4}$ -inch B. B. Chain.....	\$12.80
No. 1 Machine with 54-inch rack-bar and 15 ft. of $\frac{3}{4}$ -inch B. B. Chain.....	13.80
No. 1 Machine with 72-inch rack-bar and 15 ft. of $\frac{3}{4}$ -inch B. B. Chain.....	14.80
No. 1 Machine with 96-inch rack-bar and 15 ft. of $\frac{3}{4}$ -inch B. B. Chain.....	16.80
No. 1 Chain Grip Attachment.....	1.00
No. 2 Heavier Machine 36-inch rack-bar and 15 ft. of $\frac{1}{2}$ -inch B. B. Chain.....	13.80
No. 2 Heavier Machine 54-inch rack-bar and 15 ft. of $\frac{1}{2}$ -inch B. B. Chain.....	15.80
No. 2 Heavier Machine 72-inch.....	17.80
No. 2 Chain Grip Attachment.....	1.25

MISCELLANEOUS USES

Tightening up trolley wires.

Coupling up broken sprocket chains on coal elevators at tipples.

Moving around heavy machinery.

Bringing loose ends of haulage ropes together for splicing.

"BESTOVALL" MACHINE PUNCHER PICKS

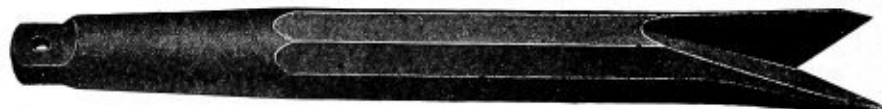


FIG. 4118

Made to fit all makes of Punching Machines.

Our "Bestovall" Puncher Pick is forged from a special grade of high carbon steel and is guaranteed to give good service. Perfect design. Full weight.

Price,each \$1.50

MINING MACHINE BITS—FINISHED

Chisel Point

Pick Point



FIG. 4119



FIG. 4120

Furnished in all sizes and pattern of points. Made from a superior grade of high carbon steel, true to size and uniform in shape, full 4 inches in length.

The sizes most frequently used which are standardized are as follows:

$\frac{1}{2} \times \frac{3}{4} \times 4$ in. Machine Bits Pick Points, Centers, Ups and Downs.

$\frac{1}{2} \times \frac{3}{4} \times 4$ in. Machine Bits Chisel Points, All Centers.

$\frac{1}{2} \times \frac{7}{8} \times 4$ in. Machine Bits Pick Points, Centers, Ups and Downs.

$\frac{1}{2} \times \frac{7}{8} \times 4$ in. Machine Bits Chisel Points, All Centers.

$\frac{1}{2} \times 1 \times 4$ in. Machine Bits Pick Points, Centers, Ups and Downs.

$\frac{1}{2} \times 1 \times 4$ in. Machine Bits Chisel Points, All Centers.

Machine bits average about 500 bits to the keg. It is advantageous to always specify in ordering Pick Point Machine Bits the number of each of Centers, Ups and Downs required, and it is absolutely necessary to specify the exact size.

Sullivan Machines Take $\frac{1}{2} \times 1$ -in. Shank. Jeffrey Machines Take $\frac{1}{2} \times \frac{3}{4}$ -in. Shank.

Price, per hundred pieces,\$10.00

MINING MACHINE BIT STEEL



FIG. 4121

We are prepared to furnish plain cut Bit Steel of the same grade used in our finished Bits, or in any other grade desired. Sizes $\frac{1}{2} \times \frac{3}{4} \times 3\frac{1}{2}$ or 4 in. and $\frac{1}{2} \times 1 \times 3\frac{1}{2}$ or 4 in. are standard sizes and are always carried in stock. Shipments of other sizes without delay.

Price, per pound, standard grade,\$0.20

COAL MINERS' TOOLS

MADE TO MEET REQUIREMENTS OF STATE MINE LAWS

No. 152
Drill

FIG. 4122

No. 155
Tamper and Scraper

FIG. 4123

No. 156
Needle, Welded Handle

FIG. 4124

No. 152. Drill. $\frac{3}{8}$ to 1 inch round, and 5 to 7 feet long.....	per dozen	\$....
No. 155. Tamper and Scraper. 5 to 7 feet long.....	per dozen	....
No. 156. Needle. 5 to 7 feet long, oil finish.....	per dozen	....
Copper Needles, made of new pure copper to meet the requirements of State Mine Laws, lengths 5 to 7 feet.....	per dozen	\$....
Tamper and Scraper—Copper Tamp, lengths 5 to 7 feet.....	per dozen	....
Copper Head Tamping Drills, lengths 5 to 7 feet.....	per dozen	....

GACO BIT BOXES



FIG. 4125

A convenient box for carrying mining machine bits. Formed from two pieces of 12-gage black sheet steel securely riveted. Has 3½-inch wrought steel chest handle fastened to top. On the back there is a 2½x1½-inch flat steel hanger for attaching box to end of pit car.

Our standard boxes are 6 inches high, 6 inches deep and 12 inches long, painted maroon.

Priceeach, \$3.00

Special sizes made to order.

COKE SCRAPER HEADS AND HOOKS

Coke Scraper Head



FIG. 4126

Coke Hook



FIG. 4127

Our "BESTOVALL" Scraper Head is of superior design. Long ribbed back; guaranteed full weight.

"BESTOVALL"price each \$3.00

"OLIVER"price each 3.00

Coke Hooksprice each 3.00

COKE SCRAPER PIPE

Made of 1-inch extra heavy pipe, plain end, carried in stock in lengths

10, 12, 14 and 15 feet. Can furnish any other length desired. .price per ft. \$0.22

COKE HOSE PIPE

Made of ¾-inch standard black pipe, plain ends. Carried in stock in lengths

14, 16 and 18 ft. Can furnish any other length desired.price per ft. \$0.11½

"PARAMOUNT" BRATTICE CLOTH

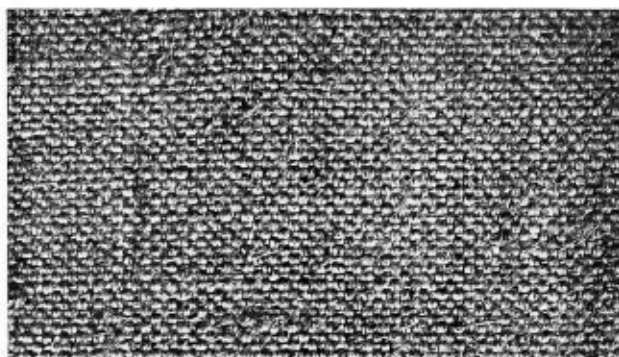


FIG. 4128

Made from the best grade of Jute Fibre, chemically treated making it non-inflammable. This cloth is often classed as a Jute Duck on account of its closely woven hard finish. Carried in stock in widths 36 in., 48 in., 60 in., 72 in., 84 in. and 96 in.

Width 36 in. to 72 in. Base

Widths 84 in. $\frac{1}{2}$ c sq. yd. extra

Widths 96 in. 1 c sq. yd. extra

Rolls contain approximately 50 lineal yards.

NO. 22 BRATTICE CLOTH

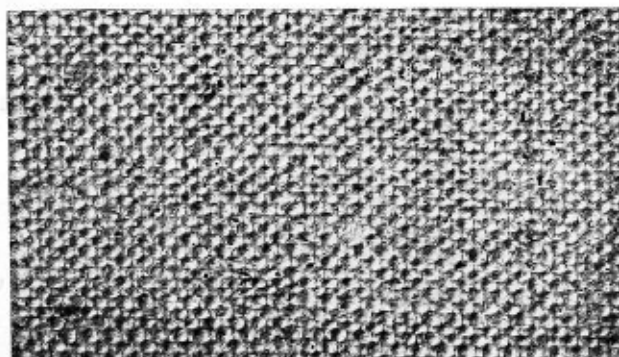


FIG. 4129

Made from the best grade of Jute. It is similar in construction to our "Paramount" Grade, except not so closely woven. A high grade cloth at a medium price. Guaranteed non-inflammable. Carried in stock in widths 36 in., 48 in., 60 in., 72 in., 84 in. and 96 in.

Widths 36 in. to 72 in. Base

Widths 84 in. $\frac{1}{2}$ c sq. yd. extra

Widths 96 in. 1 c sq. yd. extra

Rolls contain approximately 50 lineal yards.

"MONARCH" BRATTICE CLOTH

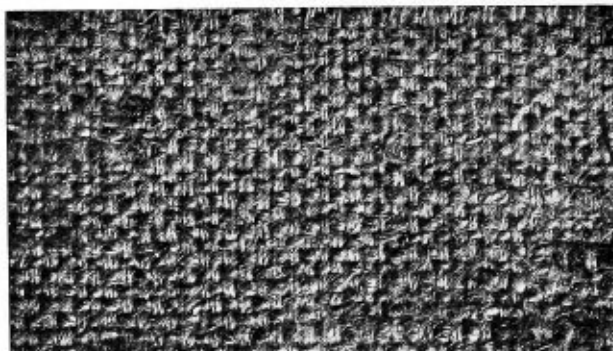


FIG. 4130

This grade of Brattice Cloth is next in quality to our No. 22. It is low in price, yet is made of a good quality of fibre and is guaranteed non-inflammable. The illustration shows the weave in comparison to our other makes. Many large coal operators use big quantities of "Monarch" for ordinary use and it has given very satisfactory results.

Carried in stock in widths 36 in., 48 in., 60 in., 72 in., 84 in. and 96 in.

Widths 36 in. to 72 in. Base

Widths 84 in. $\frac{1}{2}$ c sq. yd. extra

Widths 96 in. 1 c sq. yd. extra

Rolls contain approximately 50 lineal yards.

NO. 10 BESTOVALL WHITE COTTON DUCK
BRATTICE CLOTH

FIG. 4131

Width, 36 in.	List price per lineal yard	\$1.00
Width, 48 in.	List price per lineal yard	1.36
Width, 60 in.	List price per lineal yard	1.72
Width, 72 in.	List price per lineal yard	2.10
Width, 84 in.	List price per lineal yard	2.50
Width, 96 in.	List price per lineal yard	2.90

Note.—For price list of white cotton duck in other weights and widths, see page 1954.

MINER'S CARBIDE

Miner's Lamp Union Carbide is specially prepared, it is of uniform size and quality and on account of its high gas yield is most economical and satisfactory for use in miner's lamp.

Union Carbide
Packed in gray drums
with blue bands
Capacity 100 lbs.



FIG. 4132

Union Carbide
Packed in
blue and gray
drums
Capacity 25 lbs.



FIG. 4133

Miner's Lamp Union Carbide is packed in 100 and 25-lb. steel drums with screw top to protect it from air and moisture.

The handy 25-lb. Drum enables the dealer to get carbide into the hands of the miner in an unbroken package, with no labor, scooping, weighing or wrapping—with no loss of carbide from spilling or exposure.

100-lb. Drums.....each \$.....
25-lb. Drums.....each \$.....

Each order to call for at least four drums.

Union Carbide
Packed in gray cans
with blue bands
Capacity 10 lbs.



FIG. 4134

Union Carbide
Packed in gray
cans with
blue bands
Capacity 2 lbs.



FIG. 4135

Miner's Lamp Union Carbide is also packed in 10-lb. cans (6 cans to case) and 2-lb. cans (24 cans to case). The 10-lb. and 2-lb. cans are equipped with a compression top which can be easily replaced in position, so that the carbide remaining in the can will be thoroughly protected from air and moisture.

Carbide for House Lighting Machine—Contractor's machine and special sizes can be supplied.

10-lb. Cans.....Per case \$.....
2-lb. Cans.....Per case

Sold in case lots only.

Union Carbide is always packed in blue and gray drums or cans.

BALDWIN'S CARBIDE MINE LAMPS

NO. 130 CAP LAMP

All of these lamps can be equipped with the wind shield which screws on to the burner tube.

No. 130—Cap Lamp. Has no-trouble valve and embodies all the advantages of the old reliable Baldwin straight wire feed, plus a strong water valve.

If dirt clogs the water tube, simply rake or pump the raking wire and it is cleared. If wire needs cleaning, pull it out, scrape and put it back. If the valve needs attention it is unscrewed with your fingers—tools are never needed.

Also has non-leaking water cap, unbreakable hook, strongly re-inforced on inside and reflector brace soldered to lamp body.

Made of Brass. Height 4 in. Weight $5\frac{1}{2}$ oz. Burns 3 hours on a charge.

Price, lamp only.....each \$1.00

Price, wind shieldeach .10



FIG. 4136

NO. 160 SUPERINTENDENTS' LAMP

Made of brass, polished nickel finish. Height $5\frac{1}{4}$ in., weight 11 oz. Reflector $3\frac{1}{2}$ in. in diameter equipped with self-lighter and wind shield.

Operates with the ITP float feed which automatically regulates the production of gas. Requires no hand regulation or adjustment.

Burns 6 hours on a charge.

Price, lamp only.....each \$3.00



FIG. 4137

NO. 200 TRIP LAMP

Shows a Red Light

Made of steel, tinned. Bracket furnished to fit any steel or wooden mine car. Reflector $4\frac{1}{2}$ in. in diameter, $1\frac{1}{2}$ in. deep, furnished in red enamel. Shows a strong red light at a great distance without the use of glass. It is held in place by a 1-in. heavy steel band welded to body of the lamp which slides into a tongue on car bracket.

Equipped with wind shield. Requires no attention while burning.

Price, completeeach \$5.50

In ordering give width of bracket desired.

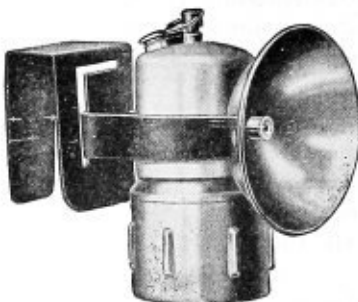
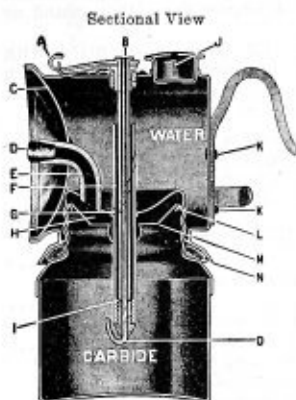


FIG. 4138

JUSTRITE MINERS' CARBIDE LAMPS

WITH LEVER FEED AND LIGHTER ATTACHMENT

16.7 CANDLE POWER
WEIGHT 5 OUNCES

- A—Lever; regulates water feed
 B—Excess gas escape
 C—German silver reflector; part of lamp
 D—Air hole tip
 E—Gas tube
 F—Water channel
 G—Water intake; slot
 H—Felt gas strainer
 I—Valve seat
 J—Water cap; with air chamber
 K—Rivets, securing hook and clasp; soldered inside
 L—Wire edge; double strength.
 M—Felt Holder
 N—Rubber gasket
 O—Bent wire; turns with lever;



FIG. 4139

Justrite lamps are constructed on scientific principles, original in design and constructed of best materials and workmanship. They are made in two parts—water reservoir and carbide container—drawn from seamless brass. Every lamp is guaranteed perfect.

A new principle in water feed—a valve enclosed in a $\frac{1}{4}$ -inch tube, so constructed that it increases or decreases the supply of water, enabling the user to burn the flame at any size desired. The valve is operated by a lever sliding back and forth over notches, and held firmly in place by a small spring. This new feed overcomes two serious objections to the wire feed lamps: (1) It will not clog and does not require agitation in order to obtain water as needed. (2) Prevents waste of carbide when through using—all gas is burned and the refuse is slacked.

No. 85.	Polished brass, with No. 77 Carbide Can.....	\$1.00
No. 57.	" " " extra bottom.....	1.10
No. 86.	Nickel plated, " No. 77 Carbide Can.....	1.25
No. 58.	" " " extra bottom.....	1.25
No. 89.	Gun Metal Finish with No. 77 Carbide Can.....	1.00
No. 59.	" " " " extra bottom.....	1.10

No matches required to light the "Matchless" Justrite. Cover the reflector with palm of the hand, hold few seconds, then draw hand downward quickly, rubbing over the steel wheel.

This lamp has the new lever feed and a $2\frac{1}{4}$ -inch polished brass reflector with a sparker attachment. There are other lamps with lighter attachment, but the Justrite is the only one which has the reflector permanently attached. It is part of the lamp and cannot get loose or fall off.

THE AMERICAN WOLF TYPE MINERS' SAFETY LAMP



FIG. 4140

The standard lamp for general use burns naphtha as fuel, is fitted with double gauzes, pyro metal or match tape internal igniter, key or magnetic lock, and burner for either round or flat wick.

American Wolf Type Safety Lamps may be fitted with either our No. 122 CV Pyro-Metal Igniter or the No. 119 Match Tape Igniter. Either of these igniters will give excellent service and the selection is a matter of personal choice.

PRICE LIST OF LAMPS

Model 1B500. Steel American Wolf Type Miner's Safety Lamp, brass trimmings, magnetic lock, No. 122CV igniter, round burner, double gauze, complete ready for use.....	each \$.....
Model 1B501. Steel. As above except with flat wick burner	each \$.....
Model 1B502. Steel. Same as 1B500 except key lock.	each \$.....
Model 1B503. Steel. Same as 1B501 except key lock.	each \$.....
Model 1B504. Aluminum. Same as 1B502 except made from light weight aluminum alloy. The aluminum lamp is made with round wick burner only	each \$.....

Above lamps may be fitted with one or more lenses as desired.

With one lens.....	extra \$.....
With two "	" \$.....
With three "	" \$.....

NOTE: Lamps are listed with pyro-igniters. Paraffin igniters supplied if specified.

No. 122CV PYRO-METAL IGNITER—ALSO PARTS

	No.	Article	Per 100
	122CV.	Pyro Metal Igniter, complete	\$.....
	83CV.	Side Spring	\$.....
	85CV.	Igniter Case	\$.....
	86CV.	Operating Spindle.	\$.....
	87CV.	Tension Spring for Pyro-Metal Bar ...	\$.....
	88CV.	Cotter Pin	\$.....
	89CV.	Adjusting Screw ..	\$.....
	90CV.	Washer with square hole.....	\$.....
	91CV.	Swivel with screw nut	\$.....
	92CV.	Main socket	\$.....
	93CV.	Steel gear	\$.....
	94CV.	Operating spring ..	\$.....
	95CV.	Friction wheel ...	\$.....
	96CV.	Fastening screw... ..	\$.....
	97CV.	Pyro-Metal bar ...	\$.....
	98CV.	Rivets for fastening 83CV to 85CV..	\$.....

NOTE—Standard packages contain 25, 50 and 100 pieces.

FIG. 4141

AMERICAN WOLF TYPE MINERS' SAFETY LAMP

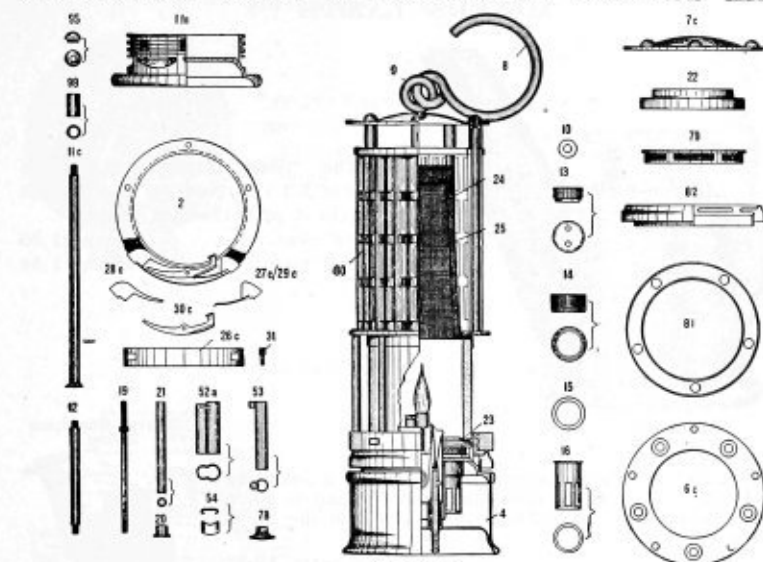


FIG. 4142

LIST OF PARTS

Ref. No.	Parts and Supplies	Ref. No.	Parts and Supplies
1 FN	Top of lamp vessel only.	27-C—29-C	Assembled spring pole with spring.
1 FNC	Top of lamp vessel with Parts 52, 13, 14, 15, 16 and 94-FN assembled.	28-C	Anchor pole.
2	Magnetic lock ring with lock complete.	30-C	Anchor beam.
2-K	Key lock ring with lock complete.	31-C	Pivot screw for anchor.
3	Lock screw for key lock.	32-C	Parts 26-C, 27-C, 28-C and 29-C assembled complete.
4	Lamp vessel only.	52	Burner for round wick.
4-C	Lamp vessel complete, assembled with Parts 1-FNC, 16, 19, 21, 53, 54 and 78. This is the lamp bottom complete.	52F	Burner for flat wick.
6-C	Middle ring.	53	Wick holder for round wick.
7-C	Dome top of lamp.	53-F	Wick holder for flat wick.
8	Lamp hook.	54	Wick stop for round wick.
9	Top dead eye.	54-F	Wick stop for flat wick.
10	Washer for top dead eye.	55	Wick for round burners in 1-lb. rolls, or packages of 1 dozen wicks.
11-C	Top standards with screw heads.	55-F	Wick for flat burners in 1-lb. rolls, or packages of 1 dozen wicks.
12	Glass standards.	78	Thumb screw for wick adjuster.
13	Filling hole stopper.	79	Air admission ring with double gauze.
14	Filling hole bushing.	80	Corrugated shield.
15	Leather washer for filling hole.	81	Top ring for stiffening shield.
16	Cotton spreader.	82	Smooth air ring.
19	Wick adjusting screw.	94-FN	Igniter well.
20	Bushing for tube No. 21.	95	Nut for Part 11-C.
21	Wick adjuster tube.	98	Spacing bushing between 7-C and 81.
22	Gauze ring.	300	Special high grade heat resisting glass globes.
23	Expansion ring.	1200	Regular grade glass globes.
24	Outer gauze, steel.	306	Red glass globes.
24-B	Outer gauze, brass.	307	Asbestos gaskets between globe and lamp frame.
25	Inner gauze, steel.		
25-B	Inner gauze, brass.		
26-C	Plate covering magnetic lock.		

MINERS' LAMPS

"Star" Sunshine Lamp



FIG. 4143

The "Star" Sunshine Lamp is made of XX Charcoal Tin and is lined throughout with 12-ounce copper.

Miners' Size.....per dozen \$2.00

Drivers' Size.....per dozen 2.50

The "Eagle" Sunshine Lamp is composed of a seamless brass body, the entire spout, including patch and cup, is made of 12-ounce copper, also a double bottom, of which the inner one is copper.

Miners' No. 1.....per dozen \$2.25

Miners' No. 2.....per dozen 2.50

Drivers' No. 1.....per dozen 3.00

"Eagle" Sunshine Lamp



FIG. 4144

"Star" Tin Lamps



FIG. 4145

The "Star" Lamps are made of XX Charcoal Tin with single or double Spouts and are adapted for burning all kinds of oil.

Miners' No. 1, Double Spout.....per dozen \$1.50

Miners' No. 2, Double Spout.....per dozen 1.75

Drivers' No. 1, Double Spout.....per dozen 2.00

Drivers' No. 2, Single Spout.....per dozen 1.85

"Eagle" Tin Lamps

The "Eagle" Lamps are made of XX Charcoal Tin, with single spout and cup. No. 3 Drivers' has brass collar.

Miners' No. 3.....per dozen \$1.50

Drivers' No. 2.....per dozen 1.85

Drivers' No. 3.....per dozen 2.50



FIG. 4146

MINERS' CANDLE WICK



FIG. 4147

"BESTOVALL," fine grade, white wick.....per lb. \$0.60

"DUQUESNE," No. 2 or medium grade.....per lb. .50

Put up in 5-lb. bales, running from 8 to 9 balls to the pound.

BRAIDED TORCH WICK

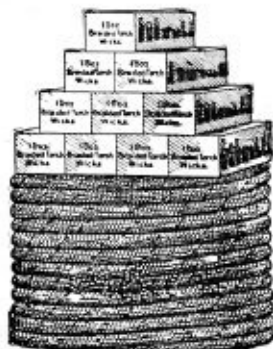


FIG. 4148

$\frac{3}{8}$ -inch diameterper lb. \$0.65

$\frac{1}{4}$ -inch diameterper lb. .65

MINERS' TIME CHECKS



FIG. 4149

Standard size—1 $\frac{3}{8}$ -in. diam., $\frac{3}{8}$ -in. hole, packed in wood boxes, 1,000 checks each.

Brassprice per 1,000 \$....

Brass platedprice per 1,000

Checks of other diameters and shapes, also numbered checks can be furnished promptly to order.

MINERS' CAPS

This cap is made of extra heavy 12-ounce duck, double stitched throughout and entirely lined with flannel. The visor is made of heavy material so as not to become affected by water or dampness. They are covered with Heavy Duck or Oil Cloth.

The attachment number 2 used in the construction of this cap is made of XX Tin, interlined with Vulcanized Fibre which will not absorb oil or water. It is attached to the cap so as to insure perfect comfort to the wearer.

No. 400

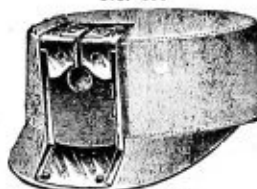


FIG. 4150

No. 65



FIG. 4151

No. 1200

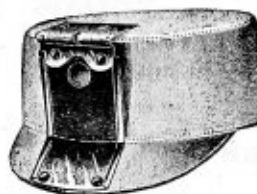


FIG. 4152

Our patent is so constructed as to force the lamp directly in front of the cap, no matter what the position of the wearer.

No. 400—2. Extra Heavy White Duck.

Listper dozen, \$5.30

No. 400—2. Extra Heavy Brown Duck.

Listper dozen, 5.30

This Cap is made of Heavy Weight Duck. The Attachment is of Sole Leather, largely used in the Anthracite Coal Fields.

No. 65. Heavy White Duck.

Listper dozen, \$5.00

No. 65. Heavy Brown Duck.

Listper dozen, 5.00

This cap is made of heavy weight White Duck and is universally known throughout the mining regions as the No. 9. The attachment is constructed of XX Tin, interlined with vulcanized fibre.

No. 1200—9. Heavy White Duck.

Listper dozen, \$5.00

No. 1200—9. Heavy Brown Duck.

Listper dozen, 5.00

MINERS' BELTS

Made of Heavy Duck, Triple Stitched, with Leather Billets and Clapes securely riveted.

This Belt is more comfortable than a leather belt.



FIG. 4153

No. 25. Heavy Canvas White Belts.

List.....per dozen, \$4.00

No. 26. Heavy Canvas Brown Belts.

List.....per dozen, 4.00

SIGNS, SAFETY BULLETIN BOARDS, SAFETY AND DANGER TAGS



FIG. 4155



FIG. 4156



FIG. 4157



FIG. 4158



FIG. 4159

A Danger Sign—based on a practical idea—a necessity. It is not enough to warn that a danger exists. The sign should show where or what the danger is or how to avoid it.

The Universal Danger Sign, with blank bottom, provides for this.

The arrow is the symbol to indicate direction, but it should also state what it indicates.

Be careful is a mighty good slogan at all times but there are many places where you want to impress upon individuals to be careful about a specific condition.

Safety-first slogans are as plentiful as the leaves on the trees. When used they should be accompanied by a Striking Attention Arresting Symbol. Pick out your slogan—send it to us and we will imprint it for you.

If everybody used caution millions of dollars in waste and hundreds of lives would be saved every year. But we should tell where, when, and how to be cautious.

All of these signs are standard as to color—passed by every insurance company—inspection department and safety unit in the country as conforming to all requirements.

Many other styles and types furnished.

MINE SPRAYERS

FOR PREVENTION OF EXPLOSIONS IN COAL MINES

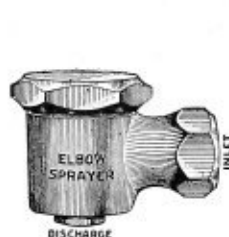


FIG. 4160



FIG. 4161



FIG. 4162

Is used for eliminating the danger of mine explosions by spraying the ventilating air current, the sprayers being located near the roof and discharging in the direction of the air current, which carries along the finely divided spray, moistening everything in its path. This prevents accumulation of dust, breaks up gas strata, and raises the ignition point.

Our sprayer pulverizes the water by centrifugal action. The jet orifice is large and not liable to stop up. All parts are interchangeable, and inexpensive. No compressed air or steam necessary.

It costs very little to introduce, and practically nothing to operate. Beside cost of sprayers, only a supply pipe from pump discharge in shaft to location of sprayer is required.

The sprayers operate on available water pressures from 15 pounds upward, operating better under higher pressures.

Our combined sprayer and shut-off cock has the advantage of immediate control, and is advantageously used at terminals of pipe lines, or at such points where independent regulation of the sprayer is desirable.

Priceeach, \$2.75
Combined sprayer and shut-off cock.....each, 3.75



FIG. 4163

MINERS' WATER GAGES

FOR MEASURING THE PRESSURE OF AIR IN MINES
IN CONNECTION WITH THE VENTILATING
APPARATUS

Plain Water Gage, with 5-inch movable brass scale
and level at topeach \$3.75

Plain Water Gage with 5-inch scale, with rack and
pinion movement and leveleach \$4.25

THE AMERICAN AUTOMATIC VIBRATORY TRIP ALARM

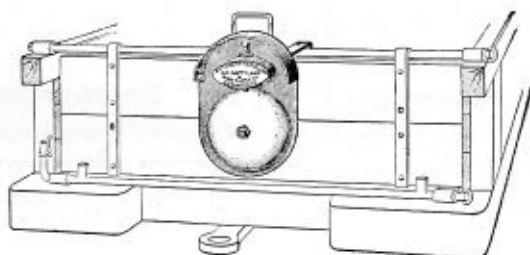


FIG. 4164

Operates by Vibration. Can Be Heard 300 to 500 Feet Ahead of Approaching Trip.

The American Automatic Trip Alarm has practically nothing about it to get out of order and is as near fool-proof as it is possible to construct it.

The American Automatic Trip Alarm has been designed to warn people off the tracks when a trip of cars being pushed by a locomotive or pulled by a rope is approaching. It consists essentially of a light and a bell suitably mounted for suspension from the front end or side of the leading car. It constitutes an "efficient alarm" under the interpretation of the law.

List Price

No. 201S	Alarm complete, steel gong, open torch.....	each \$.....
No. 201B	Alarm complete, brass gong, open torch.....	" \$.....
No. 202S	Alarm complete, steel gong, without torch.....	" \$.....
No. 202B	Alarm complete, brass gong, without torch.....	" \$.....

EXTRA PARTS

No. 2011	Torch complete, iron, for 201 Alarm.....	each \$.....
No. 2011B	Torch complete, brass, for 201 Alarm.....	" \$.....
No. 2012	Spout for torch, iron, for 201 Alarm.....	" \$.....
No. 2012B	Spout for torch, brass, for 201 Alarm.....	" \$.....
No. 2013	Springs and hammers complete for either 201 or 202 Alarms.	each \$.....
No. 2014	Bell only, 10 in. diameter, pressed steel, black varnish finish.	each \$.....
No. 2015	Bell only, 10 in. diameter, pressed steel, nickel finish....	" \$.....
No. 2016	Bell only, 10 in. diameter, pressed brass	" \$.....

DIMENSIONS

	No. 201	No. 202
Height over all.....	20 inches	14 inches
Width over all.....	12 inches	12 inches
Depth over all.....	2 inches	2 inches

THE AMERICAN PNEUMATIC SIGNAL SYSTEM

Pump with Gong

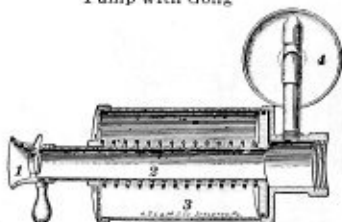


FIG. 4165

Pump with Whistle

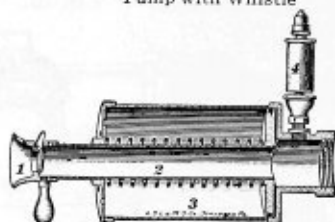


FIG. 4166

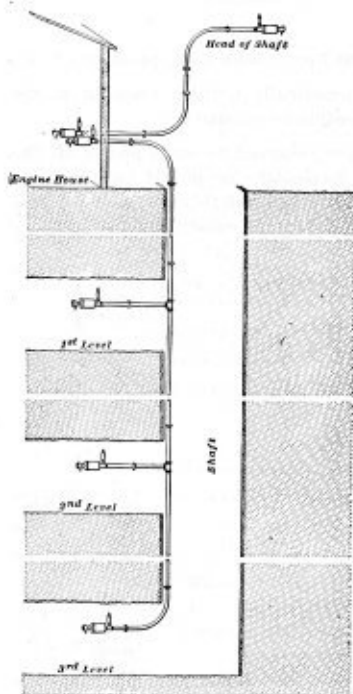


FIG. 4167

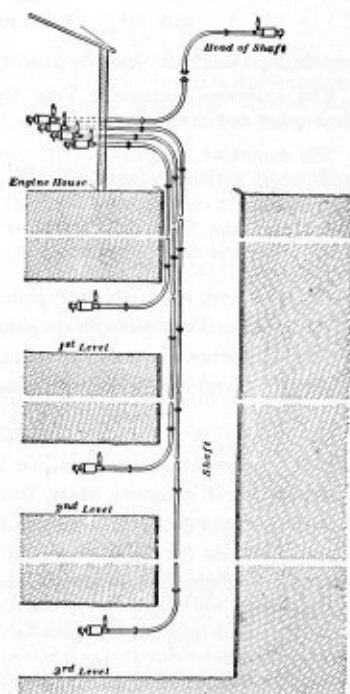


FIG. 4168

Above illustrations are suggestions as to installations. Lines, however, must be run to suit local conditions.

The American Pneumatic Signal consists essentially of a specially designed air pump, which when operated at any station on the line compresses the air sufficiently to cause the desired signal to be given simultaneously at all stations on the line. One blast of the whistle or one stroke of the gong is given for each impulse of the pump piston.

AMERICAN PNEUMATIC SIGNAL SYSTEM—CONTINUED

The use of the following signal code is required by law in some states, and is printed here for the information of prospective purchasers.

From Bottom to Top

One ring or whistle signifies to hoist coal or the empty cage and also to stop the cage when in motion.

Two rings or whistles signify to lower cage.

Three rings or whistles signify that men are coming up or going down; when return signal is received from the engineer the men shall get on the cage and the proper signal to hoist or lower shall be given.

Four rings or whistles signify to hoist slowly, implying danger.

Five rings or whistles signify accident in the mine and call for a stretcher.

Six rings or whistles signify hold cage perfectly still until signalled otherwise.

From Top to Bottom

One ring or whistle signifies all ready, get on cage.

Two rings or whistles signify send away empty cage.

The code of signals in use in any mine should be conspicuously posted at the top and at the bottom of the shaft, and in the engine room in front of the engineer when standing at his post.

M220	American Pneumatic Signal Pump, complete with gong, $6\frac{1}{4} \times 9\frac{1}{4} \times 2\frac{1}{2}$ in. for signalling up to 900 feet.....	each \$.....
M221	American Pneumatic Signal Pump, complete with whistle, $6\frac{1}{4} \times 9\frac{1}{4} \times 2\frac{1}{2}$ in. for signalling up to 900 feet.....	each \$.....
M222	American Pneumatic Signal Pump, complete with gong, $8 \times 13\frac{1}{2} \times 3$ in. for signalling up to 2,000 feet.....	each \$.....
M223	American Pneumatic Signal Pump, complete with whistle, $8 \times 13\frac{1}{2} \times 3$ in. for signalling up to 2,000 feet.....	each \$.....
M224	Signal Whistle, brass.....	" \$.....
M225	Signal Gong, steel, complete.....	" \$.....
M226	Signal Gong, brass, complete.....	" \$.....

Brass tubing and pipe at market price.

The Signal Gongs M225 and M226, and Signal Whistle M224, are shown as part 4, Figs. M220 and M221, page 1.



FIG. 4169

SPEAKING TUBE WHISTLES

For short speaking tubes combined mouthpiece and slide whistle is much used. This is a heavy brass whistle threaded $1\frac{1}{4}$ in. female and $1\frac{1}{2}$ in. male pipe threads.

Polished brasseach \$.....

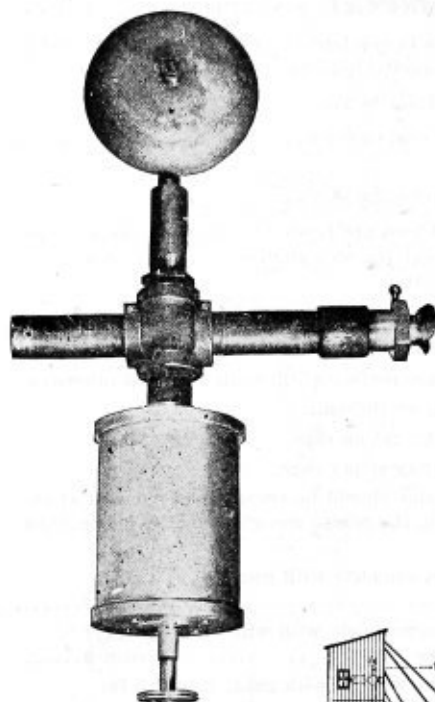
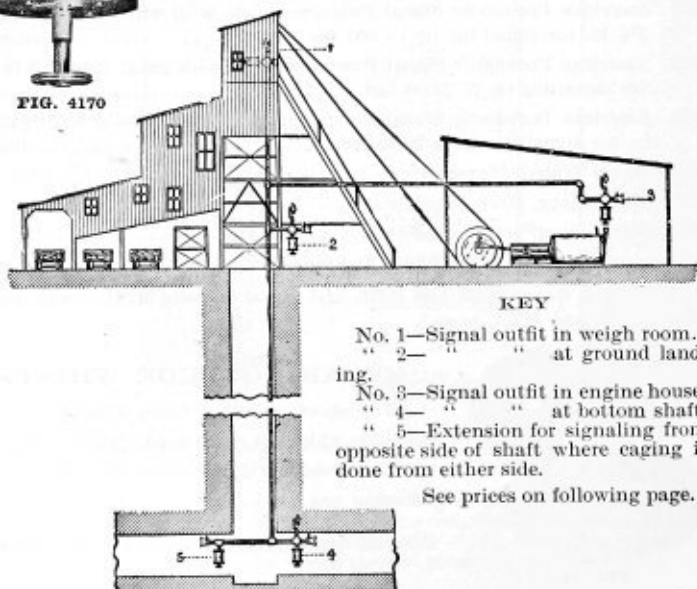


FIG. 4170

PNEUMATIC SIGNAL GONG ATTACH- MENT

FOR MINE SPEAKING TUBES

Advantages. — Material falling down shaft or from cages cannot cause an accidental signal to be made, as is the result when wires are used for mechanical signals. No wires to break. Nothing to freeze. As all signals are repeated simultaneously at all the stations, there is no chance of misunderstanding them, and every one knows just what signal has been given.



See prices on following page.

FIG. 4171

K & E ANEMOMETERS

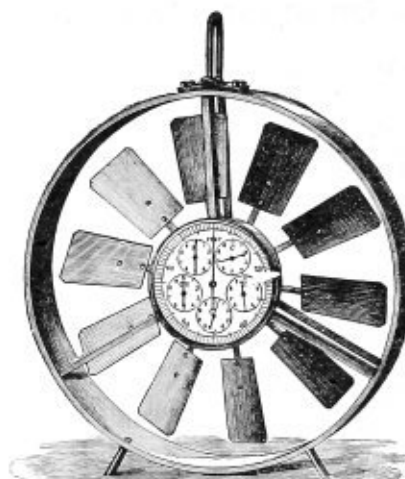


FIG. 4173

Anemometers are used for the measurement of the velocity of air currents in mines, tunnels, sewers, public buildings, hospitals, etc. As now constructed, these Anemometers embody a number of important mechanical improvements, among which may be mentioned the zero setting arrangement. Setting the instrument to zero before each reading does away with the necessity of taking a previous reading into consideration and lessens the liability of error. Each instrument is carefully calibrated and provided with a correction table. They are constructed to measure air velocities up to 2,000 feet per minute and should not be used in temperatures exceeding 300 degrees F.

WITH DISCONNECTOR

No. 5957.	Reading to 1,000 feet, 4-inch diameter.....	each \$25.50
No. 5963.	Reading to 1,000 feet, 6-inch diameter.....	each 26.00
No. 5967.	Low speed, for velocities from 75 to 400 feet per minute....	each 27.00

WITH ZERO SETTING ATTACHMENT

No. 5958Z.	Reading to 100,000 feet, 4-inch diameter.....	each \$28.00
No. 5965Z.	Reading to 10,000,000 feet, 6-inch diameter.....	each 40.00
No. 5966Z.	Reading to 1,000,000 feet, 6-inch diameter.....	each 45.00

IMPROVED PORTABLE AIR METERS



FIG. 4174

WITH DISCONNECTOR, VANE 2½ IN.
DIAMETER, IN POLISHED
MAHOGANY CASE

No. 5950.	Registers to 1,000 ft.....	each \$22.00
-----------	----------------------------	--------------

WITH ZERO SETTING ARRANGEMENT

No. 5952Z		each \$28.75
-----------	-------	--------------

MINE CAR HITCHINGS



FIG. 4175

Clevis, Inches	Pin, Inches	Links, Inches	Centers, Inches
1	1	$\frac{3}{4}$	16 and up
$1\frac{1}{8}$	$1\frac{1}{8}$	$\frac{7}{8}$	17 and up
$1\frac{1}{4}$	$1\frac{1}{4}$	1	18 and up
$1\frac{3}{8}$	$1\frac{3}{8}$	$1\frac{1}{8}$	19 and up
$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{4}$	20 and up
$1\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{1}{2}$	22 and up

Above made in BB quality, but can be varied to suit customer's requirements.



FIG. 4176

Cut shows a special coupling made in any size as required.

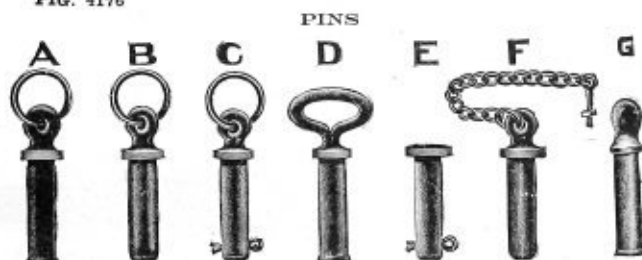


FIG. 4177

We furnish Pins in any above styles. Please refer to same as A, B, C, etc.

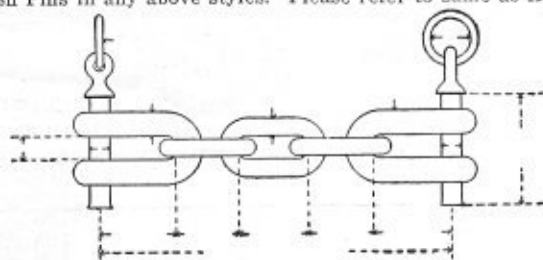


FIG. 4178

INSTRUCTIONS IN SPECIFYING

The above illustration shows one of our standard mine car couplings, with marks indicating where dimensions should be furnished when ordering.

"PITTSBURGH" COKE OVEN VALVES

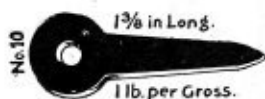
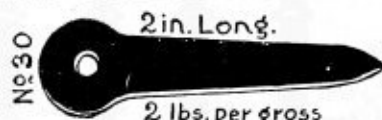
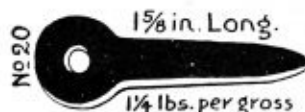
ALL PARTS EXTRA HEAVY AND INTERCHANGEABLE WITH THE CADMAN VALVE

**FIG. 4179**

Coke Oven Valve, size 1 inch	list price, each, \$1.75
" " Half Coupling, for 1-inch Hose, size 1 inch	" " .45
" " Hose Band, 1 inch wide, for 1 inch Hose, size 1 inch	" " .30
" " Valve washers	" " .10

BLACK DIAMOND MINERS' CENTER SPADS

PLAIN OR NON-CORROSIVE-CUTS ACTUAL SIZE

**FIG. 4180****FIG. 4181****FIG. 4182****FIG. 4183**

No.	Material	Length Inches	Pounds Per Gross	Price Plain Per Gross	Price Non-Corrosive Per Gross
10	Clean Cut Sheet Steel	1 3/8	1	\$1.00	\$1.25
20	" " " "	1 5/8	1 1/4	1.25	1.50
30	" " " "	2	2	1.50	1.75
400	Drop forged Spring Steel	2 1/4	6		

DYNAMITE



FIG. 4184



FIG. 4185



FIG. 4186

Per Cent	30%	40%	60%
Price	per pound \$.....	\$.....	\$.....

All dynamite will be furnished in $1\frac{1}{4} \times 8$ in. sticks unless ordered with $\frac{3}{8} \times 8$ in. Can furnish either nitroglycerin or ammonia goods from our stock; other strengths and brands from rock magazine.

PERMISSIBLE EXPLOSIVES

(For use in gaseous and dusty coal mines)

No. 1 Monobel	price per pound \$.....
No. 2 "	" " "
No. 4 " (low freezing)	" " "
No. 6 " " "	" " "

THAWING KETTLE



FIG. 4187

An apparatus for thawing dynamite cartridges and is perfectly safe. It does away with the old methods of thawing dynamite over or near a fire.

Prices furnished upon application.

BLASTING POWDER

In 25-Pound Kegs



FIG. 4188

Du Pont "A" Blasting—C, F, FF, FFF, FFFF, 5-F, 6-F, 7-F and "A" Dust.

Du Pont "B" Blasting—CCC, CC, C, F, FF, FFF, FFFF, and RR.

NOTE—Express companies will not receive explosives of any kind, therefore all explosives must be shipped by freight.



FIG. 4189

BLASTING MACHINES

Brand	No.	Maximum Capacity Elec. Fuses	Weight Lbs.		No. Posts
			Gross	Net	
Old Reliable	1	4	13	9	Two Only
Old Reliable	12	10	25	20	Two Only
Old Reliable	3	30	30	25	Two unless specially ordered 3
U. S. Std.	3	30	30	25	3 unless specially ordered with 2
Old Reliable	4	50	50	45	
U. S. Std.	4	50	50	45	

KANAWHA BLASTING PAPER

In cases of 100 rolls.

Glazed	per case \$.....
Unglazed	" "

BLASTING PAPER

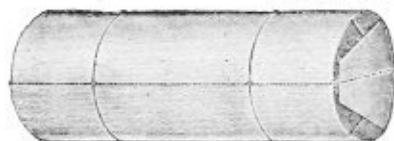


FIG. 4190

NO. XX—BEST WATERPROOF
MANILA
IN SINGLE ROLLS

In rolls	inches	9	12
List price	per lb.	\$0.10	.10

NO. 20—REGAL

5 ROLLS WRAPPED IN A BUNDLE

In rolls	inches	9	12
List price	per lb.	\$0.08	.08

Dummy paper

" sticks

per roll, \$.....

" 100,

BLASTING SUPPLIES

Leading Wire



FIG. 4191

Connecting Wire



FIG. 4192

Blasting Caps



FIG. 4193

LEADING WIRE

Price, 200, 250, 300 and 500 feet in coll.....per hundred feet \$.....

The above Leading Wire is No. 14 B. & S. gauge, both single and duplex.

CONNECTING WIRE

Price, one and two pound spools.....per pound \$.....

The above Connecting Wire is No. 20 B. & S. gauge.

BLASTING CAPS

Number	Weight of Charge	List Price Per 1000
4	10.03 grains	\$.....
5	12.34 "	.....
6	15.43 "	.....

No. 6 cap recommended by Du Pont Company as specially adapted for "Permissible" and other high explosives.

Victor Electrical Fuses



FIG. 4194

Cap Crimper and Fuse Cutter



FIG. 4195

ELECTRICAL FUSES-DOUBLE-WOUND INSULATION

Length of wire.....feet	4	6	8	10	12	14	16
Price, Standard strength, per hundred	\$3.00	3.54	4.08	4.62	5.16	5.70	6.24
" Double " " "	3.75	4.29	4.83	5.37	5.91	6.45	6.99

Length of wire.....feet	18	20	22	24	26	28	30
Price, Standard strength, per hundred	\$6.78	7.32	8.32	9.32	10.32	11.32	12.32
" Double " " "	7.53	8.07	9.07	10.07	11.07	12.07	13.07

In ordering specify strength and length desired. Longer lengths made to order.

CAP CRIMPERS AND FUSE CUTTERS

Price.....per dozen \$9.00

FUSE

Single and double tape, plain and waterproof.

MINERS' SAFETY SQUIBS FOR FIRING BLASTS IN COAL MINING

**FIG. 4196****BLUE LABEL SQUIBS**

Considered the best squib for general use. Packed 100 in a box, 100 boxes to a case. Sold only in case lots.

List priceper 1,000 \$....

GENUINE POWELL SQUIBS

List priceper 1,000 \$....

SQUIB CASES**FIG. 4197**

Tin. Size 8x1½x7½ inch, holds 100 Squibs.

List priceper dozen \$1.20

MINERS' POWDER AND OIL CANS AND COFFEE FLASKS

Powder Can**FIG. 4198****Oil Can IC****FIG. 4199****Coffee Flask IC****FIG. 4200****POWDER CANS**

No. 5. Capacity 2 quarts.....list per gross \$36.40

STAMPED TOP OIL CANS

Nos.	2	4	8
Capacity, quarts	2	4	8
List per gross.....	\$44.00	\$55.00	\$80.00

COFFEE FLASKS

No.	1	2	3	4
Capacity	1 pint	1½	1¾	2
1-inch screw	per gross \$20.00	22.00	.....	.....
1½-inch screw	per gross .....	.....	30.00	32.00

WATER DIPPERS

Galvanized

Stamped IC



FIG. 4201

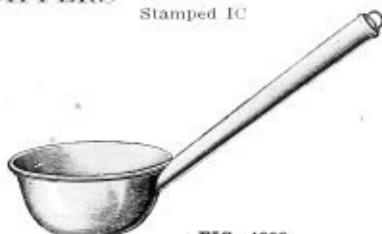


FIG. 4202

GALVANIZED WATER DIPPERS, RIVETED HANDLES

Nos.	410	420	430
Quarts	$\frac{1}{2}$	$\frac{3}{4}$	$1\frac{1}{2}$
Price	per gross \$		

STAMPED WATER DIPPERS

Pints	$\frac{1}{2}$	$\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$
Price, plain	per gross, \$11.54	13.54	14.40	16.50
Price, retinned	per gross, 22.00	24.50	26.70	29.80

PIECED WATER CUPS, IC



FIG. 4203

No.	20	21	22	23	24
Capacity	$\frac{1}{4}$ Pint	$\frac{3}{8}$ Pint	$1\frac{1}{4}$ Pint	1 Quart	$1\frac{3}{4}$ Quart
Price	per gross \$5.90	6.60	11.60	15.30	21.60

MINERS' DINNER PAILS

Round



FIG. 4204

Square



FIG. 4205

ROUND DINNER PAILS

One compartment, heavy ears, extra long bail, black enameled wood handle.

No.	40	50	60
Quarts	$3\frac{1}{2}$	$4\frac{1}{2}$	5
Price	per gross \$83.40		

SQUARE DINNER PAILS

With cup. Special long ear and cover locking bail. Black enameled wood handle. Deep drop.

No.	300	400	450
Quarts	$2\frac{1}{2}$	$3\frac{3}{4}$	4
Price	per gross \$83.40		

KILN DRIED BLACK GUMWOOD MINE ROLLERS

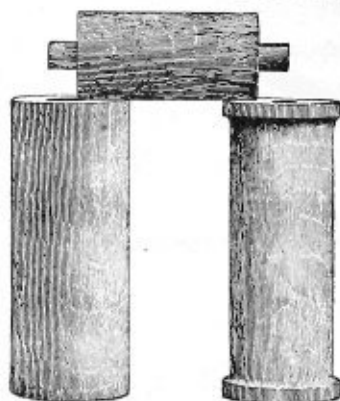


FIG. 4206

End Dia. in.	Length in.	Each	End Dia. in.	Length in.	Each	End Dia. in.	Length in.	Each
5	12	\$0.30	6	12	\$0.36	8	12	\$0.48
5	14	.33	6	14	.42	8	14	.56
5	16	.35	6	16	.48	8	16	.64
5	18	.38	6	18	.54	8	18	.72
5	20	.42	6	20	.60	8	20	.80
5	22	.47	6	22	.66	8	22	.88
5	24	.52	6	24	.72	8	24	.92

Prices on special sizes quoted upon application.

IMPORTANT:—When ordering be sure to specify the size hole and depth to bore. Unless specified "Straight Face," we will ship our standard spool shape, with flange at each end 1 in. wide and $\frac{1}{4}$ in. high, making middle diameter $\frac{1}{2}$ in. less than end diameter.

We furnish rollers with $\frac{1}{4}$ in. or $\frac{1}{2}$ in. flange or the straight face rollers at the same price, governed always by the end diameter.

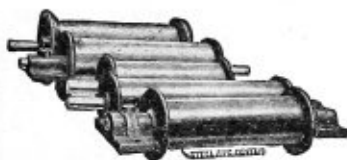
Unless otherwise specified we ship rollers with $\frac{1}{4}$ in. flange.

Price on spindle end rollers or other specials quoted on request.

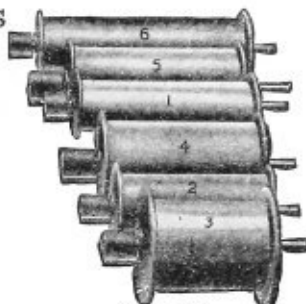
Extra Cost of Iron Spindles Driven in Rollers

Length	inches	16	18	20	22	24	26	28	30
$\frac{3}{8}$ diameter	each	\$0.26	.28	.30	.32	.34	.38	.42	.44
$\frac{1}{2}$ diameter	each	.34	.36	.38	.42	.44	.50	.54	.52
$\frac{3}{4}$ diameter	each	.42	.45	.49	.52	.60	.64	.68	.70
1 diameter	each	.50	.57	.60	.66	.78	.80	.84	.89

INCLINE ROLLERS



STYLE 2-B
FIG. 4207



Style 2-F
FIG. 4208

STYLE 2-B STEEL PIPE INCLINE ROLLERS

No. to Order by	Size of Pipe Center, inches	Outside Diam. of Pipe Center, inches	Outside Diameter Flanges, inches	Length of Pipe Center, inches	Length over all Spindle, inches	Size of Spindle, inches	Price Without Boxes	Price With Boxes	Weight Without Boxes	Weight With Boxes	Pattern No. of Boxes	Price Extra Pipe Sections
40	4	4 1/2	6 1/2	12	12 1/2	1 1/2	\$2.50	\$3.10	35	45	41	\$0.80
44	4	4 1/2	6 1/2	12	12 1/2	1 1/2	2.94	3.54	44	54	41	1.12
48	4	4 1/2	6 1/2	12	12 1/2	1 1/2	3.38	3.98	54	64	41	1.45
450	4	4 1/2	6 1/2	12	12 1/2	1 1/2	3.82	4.42	64	74	41	1.78
454	4	4 1/2	6 1/2	12	12 1/2	1 1/2	4.26	4.86	74	84	41	2.11
458	4	4 1/2	6 1/2	12	12 1/2	1 1/2	4.70	5.30	84	94	41	2.44
50	5	5 1/2	7 1/2	14	14 1/2	1 1/2	4.00	4.60	53	63	41	1.55
54	5	5 1/2	7 1/2	14	14 1/2	1 1/2	4.45	5.05	63	73	41	1.88
58	5	5 1/2	7 1/2	14	14 1/2	1 1/2	4.90	5.50	73	83	41	2.21
60	6	6 1/2	8 1/2	16	16 1/2	1 1/2	4.35	4.95	70	80	41	1.95
64	6	6 1/2	8 1/2	16	16 1/2	1 1/2	4.80	5.40	80	90	41	2.28
68	6	6 1/2	8 1/2	16	16 1/2	1 1/2	5.25	5.85	90	100	41	2.61
70	7	7 1/2	9 1/2	18	18 1/2	1 1/2	5.70	6.30	100	110	41	2.94
74	7	7 1/2	9 1/2	18	18 1/2	1 1/2	6.15	6.75	110	120	41	3.27
78	7	7 1/2	9 1/2	18	18 1/2	1 1/2	6.60	7.20	120	130	41	3.60
80	8	8 1/2	10 1/2	20	20 1/2	1 1/2	7.05	7.65	130	140	41	3.93
84	8	8 1/2	10 1/2	20	20 1/2	1 1/2	7.50	8.10	140	150	41	4.26
88	8	8 1/2	10 1/2	20	20 1/2	1 1/2	7.95	8.55	150	160	41	4.59

STYLE 2-F GRAY CAST IRON ROLLERS WITH STEEL SPINDLES

No. of Roller	Diam. of Spool, inches	Diam. of Flange, inches	Length Inside Flange, inches	Length of Shaft, inches	Size of Shaft, inches	List Price of Roller only, No Boxes	List Price of Roller and Boxes	Weight Without Boxes	Weight With Boxes	Pattern No. of Roller
1	4 1/2	8	18	12 1/2	1 1/2	\$2.95	\$3.45	59	69	182
2	5	9	19	13 1/2	1 1/2	3.40	3.90	69	79	40
3	6	10	20	14 1/2	1 1/2	3.85	4.35	79	89	990
4	7	11	21	15 1/2	1 1/2	4.30	4.80	89	99	98
5	8	12	22	16 1/2	1 1/2	4.75	5.25	99	109	91
6	9	13	23	17 1/2	1 1/2	5.20	5.70	109	119	557
7	10	14	24	18 1/2	1 1/2	5.65	6.15	119	129	1683

The shafts of all rollers are centered with reference to the outside diameter of the roller, and machined up, to make the rolls easy turning and steady. The average thickness of the shell of the roller is $\frac{1}{4}$ inches. These rollers are thoroughly first class. Light and easy running.

MINE SHEAVES AND BULL WHEELS



FIG. 4209

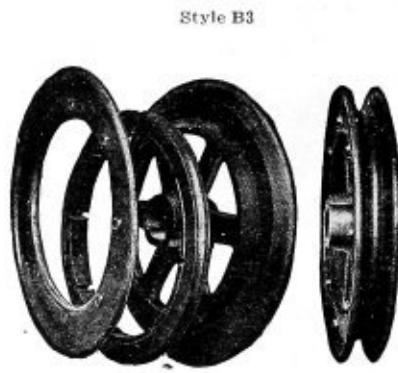


FIG. 4210

STYLE No. A-3 SHEAVES

Accurate, strong, well proportioned Bull Wheels with deep wide grooves for wire rope.

Pat. Number of Sheave	Outside Diam. of Sheave	Inside Diam. of Sheave	Maximum Size of Rope	Weight	Maximum Bore	Width Across Groove	Distance Through Hub	Price Bored
50	24 in.	18 in.	1 1/4 in.	152 lbs.	12 in.	3 1/2 in.	8 in.	\$ 8.00
1503	30 in.	24 in.	1 1/2 in.	195 lbs.	13 in.	3 3/4 in.	6 1/2 in.	10.00
690	36 in.	30 in.	1 3/4 in.	245 lbs.	13 1/2 in.	3 3/4 in.	6 1/2 in.	12.30
1501	42 in.	36 in.	1 3/4 in.	282 lbs.	13 1/2 in.	3 3/4 in.	6 1/2 in.	14.00
169	48 in.	42 in.	1 3/4 in.	395 lbs.	13 1/2 in.	3 3/4 in.	8 in.	19.50
1679	54 in.	48 in.	1 3/4 in.	520 lbs.	13 1/2 in.	3 3/4 in.	8 in.	25.00
450	60 in.	53 1/2 in.	1 3/4 in.	651 lbs.	13 1/2 in.	3 3/4 in.	9 1/2 in.	31.00

STYLE No. B-3 BULL WHEELS

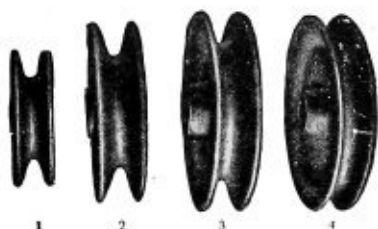
Special heavy sectional Bull Wheel. This is a fine outfit for carrying rope under heavy strain, like the duty of carrying the rope from the drum over the knuckle of an incline. The center section takes the wear, and when worn out can be easily replaced at a small cost, thus saving a great deal of money in the long run. This center is accurately machined to fit. The sections are fastened together with lock washers.

Outside diameter sheaves.....inches 20
 Largest ropeinches 1 1/2
 Through hubinches 6 1/2
 Center No.1566
 Weight entire assembled sheave.....lbs. 295
 Price of complete sheave outfit bored\$18.44

Inside diameterinches 24
 Maximum boreinches 3 1/2
 Pat. left hand piece.....1561-B
 Right hand No.1561-A
 Weight of center.....lbs. 62
 Price of extra center piece.....\$4.70

Shaft and boxes furnished with or without collars, extra, of any length desired or size shaft as may be specified. State whether sheave is to run loose or tight on shaft.

MINE SHEAVES



STYLE 3-C. CAST IRON DEEP GROOVED
SOLID WEB SHEAVES—GRAY IRON
FIG. 4211

STYLE 3-C CAST IRON DEEP GROOVED SOLID WEB SHEAVES

Sheave number	1	2	3	4
Pattern No.	1041	128	849	449
Weight, pounds	37	62	91	80
Outside diameter, inches	12	16	18	18
Inside diameter, inches	7	10 $\frac{1}{4}$	12	14
Maximum rope	1 $\frac{1}{4}$	1 $\frac{1}{4}$	1 $\frac{1}{4}$	2 $\frac{1}{4}$
Maximum bore	1 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$
Dist. through hub, inches	3 $\frac{3}{4}$	4 $\frac{1}{4}$	4 $\frac{1}{8}$	3 $\frac{1}{2}$
Price each bored	\$1.90	\$3.00	\$4.40	\$3.20

Give figure and pattern number. State whether to be tight or loose on shafts. Shafts and boxes furnished extra as desired. Give exact bore.

CURVE OUTFIT

OUTFIT FOR CARRYING ROPE AROUND CURVE

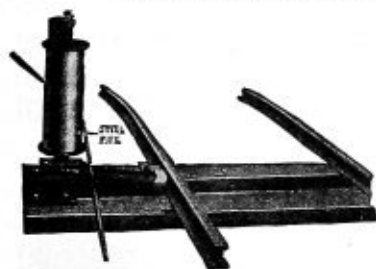


FIG. 4212

The vertical sheave is a standard steel pipe roller of any diameter or length, and, unless otherwise specified, it is furnished of 6 in. pipe, 6 $\frac{1}{2}$ in. outside diameter and 18 inches long between flanges. The pipe roller spindle is 1 $\frac{1}{8}$ in. diameter. The pipe roller only weighs 80 lbs. and costs \$4.95. The top and bottom boxes, patterns Nos. 1364 and 1435, respectively, weigh 10 lbs. The pipe roller with two boxes cost \$5.45. The taper sheave, pattern No. 1437, is 12 in. long, has a diameter at large end of 5 $\frac{1}{2}$ in., and at small end of 3 in. and diameter of flange of 7 in. It weighs without box or shaft 85 lbs., and with box and shaft 1 $\frac{1}{2}$ diameter, weighs 110 lbs., and costs \$5.50. The shaft is 22 $\frac{1}{2}$ inches long. The box for the taper sheave is pattern No. 1436, and the whole outfit is shown on our drawing D-312. The forging at end of the taper shaft is made of 1 $\frac{1}{2}$ in. x $\frac{1}{2}$ in. and weighs 7 lbs. The weight of the whole outfit with 6 in. x 18 in. vertical pipe roller is 217 lbs. and the cost \$11.35. Any other vertical pipe roller can be substituted at corresponding difference in cost. The distance from the gauge line of track to inside of vertical roller is 15 inches and the distance to end of the horizontal shaft 25 inches.

CHILLED KNUCKLE ROLLERS



STYLE No. 1-A
FIG. 4213

STYLE No. 1-A		
Length	inches	8
Largest diameter	"	12
Smallest diameter	"	9
Size of shaft	"	1 1/2
Length of shaft	"	30
Weight of shaft	pounds	27
Pattern No. of roller		374
Weight of roller	pounds	72
Pattern No. of boxes		185
Weight of 2 boxes	pounds	31
Price of chilled roller only		\$4.35
Price of roller, 30 in. of shaft and 2 boxes		7.25



STYLE No. 1-C
FIG. 4214

STYLE No. 1-C		
Largest diameter	inches	12
Smallest diameter	"	9
Width between flanges	"	3
Size of shaft	"	1 1/2
Length of shaft	"	30
Weight of shaft	pounds	27
Roller pattern No.		44
Weight of roller	pounds	45
Pattern No. of boxes		185
Weight of 2 boxes	pounds	31
Price of chilled roller only		\$2.80
Price of chilled roller, 30 in. of shaft and 2 boxes		5.70



STYLE No. 1-D
FIG. 4215

STYLE No. 1-D		
Largest diameter	inches	19 3/4
Inside diameter	"	16
Width between flanges	"	4
Maximum bore	"	2 7/8
Pattern No.		1412
Weight	pounds	170
Weight of 30 in. of 1 1/2 in. shaft		27
Pattern No. of boxes		185
Weight of 2 boxes	pounds	31
Price of chilled roller only		\$8.25
Price of chilled roller, 30 in. of 1 1/2 in. shaft and 2 boxes		11.15



STYLE No. 1-E
FIG. 4216

STYLE No. 1-E
Made of 2 Whitney wheels with hubs faced off and spokes fastened together with steel forgings. Made in any diameter of wheel from 9 in. to 20 in. Sizes of shafts range from 1 1/2 in. to 2 7/8 in. List price of outfit 5c. per pound. To order give: (1) diameter of wheel on face; (2) size of shaft wanted; (3) length of shaft wanted; (4) state whether boxings are wanted.



STYLE No. 1-F
FIG. 4217

STYLE No. 1-F		
Largest diameter	inches	16 3/4
Smallest diameter	"	14
Width between flanges	"	4 1/2
Maximum bore	"	2 7/8
Pattern No. of roller		1118
Weight	pounds	124
Weight of 30 in. of 1 1/2 in. shaft		27
Pattern No. of boxes		185
Weight of 2 boxes	pounds	31
Price of chilled roller only		\$6.88
Price chilled roller, 30 in. of shaft, 2 boxes		9.78

NOTE—1 1/2 in. shaft weighs 10 lbs. per foot and costs 50 cents per foot. Two boxes for same pattern 185 weigh 31 lbs. and cost \$1.65 per pair. 2 7/8 in. shafting weighs 13 lbs. per foot and costs 56 cents per foot. Two boxes pattern 185 for same weigh 31 lbs. and cost \$1.65 per pair. 2 7/8 in. shaft weighs 16 lbs. per foot and costs 68 cents per foot. Two boxes for same pattern No. 1196 weigh 48 lbs. and cost \$2.40 per pair. 2 7/8 in. shafting weighs 23 lbs. per foot and costs 96 cents per foot. Two boxes for same pattern 1499 weigh 72 lbs. and cost \$3.60 per pair.

STEEL PIPE KNUCKLE ROLLERS

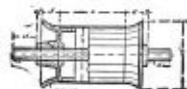


STYLE NO. 1-G
FIG. 4218

STYLE NO. 1-G

Rollers made of steel pipe fastened on cast iron flanges. The flanges are turned on lathe and bored with reference to outside diameter of steel pipe section, making a perfectly uniform and well balanced roller, which turns easily. The shaft runs loose in the roller. The steel pipe center lasts a long time, but when worn out, can be cheaply and quickly renewed.

No. to Order by	Size Standard Pipe, inches	Approx. Outside Diam. of Pipe, inches	Length of Pipe	Outside Diam. of Flanges	Length of Roller Out to End of Hubs, inches	Weight of Roller Without Shaft or Boxes	Price of Each Roller Without Shaft or Boxes	Price With 20-in. 1 1/2-in. Shaft, 2 Boxes, Pat. 135	Net Roller With 20-in. 1 1/2-in. Shaft, 2 Boxes	Extra Pipe Sections
78	8	7 1/2	12	10 1/2	11 1/2	87	\$ 5.24	\$ 8.14	145	\$1.15
78	8	7 1/2	12	10 1/2	11 1/2	95	5.74	8.64	153	1.65
78	8	7 1/2	14	10 1/2	13 1/2	103	6.24	9.14	161	2.15
88	8	8 1/2	12	11 1/2	11 1/2	107	6.55	9.45	161	1.45
88	8	8 1/2	12	11 1/2	11 1/2	112	7.15	10.05	170	2.05
88	8	8 1/2	14	11 1/2	13 1/2	121	7.75	10.65	179	2.65
108	10	10 3/4	12	12 3/4	12 3/4	146	8.70	11.60	204	2.10
102	10	10 3/4	12	12 3/4	16	160	9.65	12.55	218	3.00
106	10	10 3/4	16	12 3/4	20	174	10.55	13.45	232	3.90
128	12	12 3/4	8	14 3/4	12 1/2	169	10.60	13.50	227	2.50
128	12	12 3/4	12	14 3/4	16 1/2	185	11.70	14.60	243	3.60
126	12	12 3/4	16	14 3/4	20 1/2	201	12.70	15.60	259	4.70



STYLE NO. 2-A
FIG. 4219

STYLE NO. 2-A

Special design of steel pipe roller with sloping flanges as this illustration will be furnished at the net prices quoted for steel roller No. 1-G plus 10 per cent.

INCLINE SHEAVES

STYLE NO. 2-C



STYLE 2-C

FIG. 4220

Special Heavy Incline Roller with Stand. Sheave Gray Iron

Outside diameter of sheave.....	inches	12
Inside diameter	inches	9
Width between flanges	inches	4 1/2
Distance through hub	inches	5 1/2
Sheave pattern No.....		1636
Weight	lbs.	44
Stand pattern No.....		1637
Weight stand and shaft.....	lbs.	75
Size of shaft.....	inches	1 1/4
Stand 8 in. wide by 17 in. long.		

Height to top of sheave.....	inches	13 1/2
Price of soft sheave only.....		\$2.20
Price of soft sheave and stand.....		5.90

INCLINE SHEAVES

STYLE No. 2-D WITH STAND



STYLE 2-D

FIG. 4221

Outside diameter of sheave.....inches	7 $\frac{1}{4}$
Maximum rope	1 $\frac{1}{8}$
Total height from ground to top....."	9 $\frac{1}{4}$
Pattern No. of sheave.....	841
Weight sheave	14
Pattern No. stand.....	317
Weight stand	16
Length of base of stand.....inches	9
Price of soft sheave only.....	\$0.80
Price of soft sheave and stand.....	1.90

CURVE SHEAVES

STYLE No. 4-A WITH STAND



STYLE 4-A

FIG. 4222

Outside diameter of sheave.....inches	4 $\frac{1}{8}$
Inside diameter	3 $\frac{1}{8}$
Pattern No. of sheave.....	82
Weight	3
Pattern No. of stand.....	83
Weight	6
Height to top of $\frac{3}{4}$ -inch bolt.....inches	4
Stand—	
Width	2 $\frac{1}{2}$
Length	9 $\frac{1}{2}$
Size of rope....."	$\frac{3}{4}$
Price of soft sheave only.....	\$0.35
Price of sheave and stand.....	1.00

STYLE No. 4-C WITH STAND



STYLE 4-C

FIG. 4223

Outside diameter of sheave.....inches	10
Inside diameter	8 $\frac{1}{2}$
Pattern No. of sheave.....	850
Weight	20
Pattern No. of stand.....	1434
Weight	23
Height to top of 1-inch pin.....inches	7 $\frac{1}{4}$
Stand—	
Width	4
Length	17
Maximum rope	1 $\frac{1}{2}$
Dis. and thro. hub....."	4 $\frac{1}{4}$
Price of soft sheave only.....	\$1.05
Price of sheave and stand.....	2.40

STYLE No. 4-E WITH STAND



STYLE 4-E

FIG. 4224

Outside diameter of sheave.....inches	7
Inside diameter	5 $\frac{1}{4}$
Width across flanges	3
Spindle	1 $\frac{1}{8}$
Pattern No. chilled sheave.....	880
Weight	15
Pattern No. of stand.....	1468
Weight	25
Stand—	
Width	6
Length	15
Height above ground to top....."	7
Price of chilled sheave only	\$1.15
Price of chilled sheave and stand.....	2.65

CURVE SHEAVES

STYLE No. 4-F WITH STAND



STYLE 4-F

FIG. 4225

Outside diameter of sheave.....	inches	7
Inside diameter	"	5 3/4
Width between flanges.....	"	2 3/4
Spindle	"	1 1/2
Pattern No. chilled sheave.....		933
Weight	pounds	18
Pattern No. of stand.....		1466
Weight	pounds	25
Stand—Width	inches	6
Length	"	15
Total height above ground.....	"	7
Price of chilled sheave only.....		\$1.25
Price of chilled sheave and stand.....		2.75

STYLE No. 4-H WITH STAND



STYLE 4-H

FIG. 4226

Outside diameter of sheave.....	inches	9
Inside diameter	"	7 1/4
Width between flanges.....	"	2 3/4
Thro. hub	"	3 1/4
Sheave pattern No.....		1453
Weight	pounds	22
Stand pattern No.....		1454
Weight	pounds	31
Stand—Width	inches	6
Length	"	14 1/2
Total height above ground to top.....	"	6 1/2
Spindle	"	1 1/2
Price of chilled sheave only.....		\$1.50
Price of chilled sheave and stand.....		3.25

STYLE No. 4-K WITH STAND



STYLE 4-K

FIG. 4227

Outside diameter sheave	inches	12
Inside diameter	"	9 3/4
Width between flanges.....	"	2 3/4
Size of spindle	"	1 1/2
Sheave pattern No.....		1456
Weight	pounds	34
Stand pattern No.....		1457
Weight	pounds	35
Stand—Width	inches	6
Length	"	18
Height above ground to top.....	"	5 1/4
Price of chilled sheave only		\$2.15
Price of chilled sheave and stand.....		4.20

STYLE No. 4-L WITH STAND



STYLE No. 4-L

FIG. 4228

Diameter of sheave next to stand.....	inches	12
Diameter at outside	"	10 7/8
Smallest diameter of sheave.....	"	9
Spindle	"	1 1/2
Chilled sheave pattern No.....		376
Weight	pounds	36
Stand pattern No.....		1462
Weight	pounds	50
Stand—Width	inches	6
Length	"	20
Width sheave between flanges.....	"	3
Total height above ground.....	"	7 1/2
Price of each chilled sheave		\$2.25
Price of each chilled sheave and stand.....		4.70

CURVE SHEAVES

STYLE NO. 5-A WITH STAND



STYLE 5-A

FIG. 4229

Outside diameter of sheave.....	inches	7
Inside diameter of sheave.....	"	5½
Width inside flanges.....	"	3
Size of shaft.....	"	1
Total height to top of stand.....	"	8
Length of base.....	"	21
Width of base at widest point.....	"	6
Pattern No. of roller.....		880
Weight.....	pounds	15
Pattern No. of stand.....		1137
Weight.....	pounds	32
Price of soft sheave only.....		\$0.80
Price of chilled sheave only.....		1.05
Price of soft sheave and stand.....		2.75
Price of chilled sheave and stand.....		3.00

STYLE NO. 5-B WITH STAND



STYLE 5-B

FIG. 4230

Outside diameter of sheave.....	inches	7
Inside diameter of sheave.....	"	5½
Width inside flanges.....	"	3
Size of shaft.....	"	1
Total height to top of stand.....	"	8
Stand 21 in. long by 6 in. wide at widest point.		
Pattern No. of sheave.....		933
Weight.....	pounds	18
Pattern No. of stand.....		1137
Weight.....	pounds	33
List price of soft sheave only.....		\$1.00
List price of chilled sheave only.....		1.25
List price of soft sheave and stand.....		2.90
List price of chilled sheave and stand.....		3.20

STYLE NO. 5-C WITH STAND



STYLE 5-C

FIG. 4231

Outside diameter of sheave.....	inches	7½
Inside diameter.....	"	5
Width inside flanges.....	"	3½
Size of shaft.....	"	1½
Total height of stand.....	"	8½
Stand 4 in. wide by 17½ in. long.		
Pattern No. of sheave, soft, 42; chilled.....		472
Pattern No. of stand.....		296
Weight of sheave.....	pounds	32
Weight of stand.....	"	33
Price of soft sheave only.....		\$1.60
Price of chilled sheave only.....		2.00
Price of soft sheave and stand.....		3.30
Price of chilled sheave and stand.....		3.70

STYLE NO. 5-D WITH STAND



STYLE 5-D

FIG. 4232

Outside diameter of sheave.....	inches	16
Inside diameter.....	"	10
Width between flanges.....	"	3
Size of shaft.....	"	1½
Total height from ground to top.....	"	9
Length of base.....	"	28½
Pattern No. of sheave.....		128
Pattern No. of stand.....		129
Weight of sheave.....	pounds	65
Weight of stand.....	"	100
Price of soft sheave only.....		\$3.00
Price of sheave and stand.....		8.00

TO ORDER

Give figure number and state exactly what parts are wanted. If a sheave is wanted without its stand, order "Sheave Only." State whether boxes are desired with those sheaves using them and give size and length of shaft wanted.

WEIGHTS, ETC., OF STEEL RAILS AND FASTENINGS

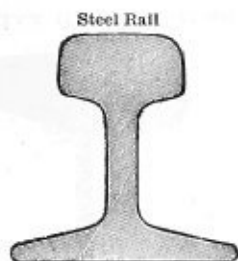


FIG. 4234

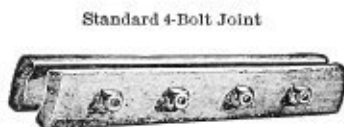


FIG. 4235

RAILS, PER MILE

Weight, per yd...lbs.	100	95	90	85	80	75	72	70	68
Gross tons..per mile	157.14	149.28	141.22	133.57	125.72	117.85	113.14	110.00	106.85
Weight, per yd...lbs.	67	66	65	64	63	62	60	58	57
Gross tons..per mile	105.28	103.71	102.14	100.55	99.00	97.43	94.30	91.14	89.55
Weight, per yd...lbs.	56	55	52	50	45	40	35	30	25
Gross tons..per mile	88.00	86.42	81.71	78.57	70.71	62.86	55.00	47.14	39.29
Weight, per yd.....lbs.	20	16	14	12	10	8			
Gross tons.....per mile	31.43	25.14	22.00	18.85	15.71	12.57			

FASTENINGS, PER MILE

Length of rail.....feet	30	28	26	24	22	20	18
Number of splice bars.....	704	754	812	880	960	1056	1174
Number of bolts.....	1408	1508	1624	1760	1980	2112	2348

FASTENINGS PER TON OF RAIL

Weight of rail	8	10	12	14	16	20
Feet of track	420	336	280	240	210	168
Joints complete, 20-foot rails.....	42	34	28	24	21	17
Joints complete, 30-foot rails.....	28	23	19	16	14	12

CROSS-TIES PER MILE OF SINGLE TRACK

Center to center.....inches	18	24	27	30	33	36
Number of ties.....	3520	2641	2348	2113	1921	1761

TABLE OF CUBIC YARDS OF BALLAST PER MILE

Side-slope of the ballast 1 to 1 Width in clear between tracks of double-track road, 6 feet.

Depth, Inches	Top Width, Single Track, Feet			Top Width, Double Track, Feet		
	10	11	12	21	22	23
	Cubic Yds.	Cubic Yds.	Cubic Yds.	Cubic Yds.	Cubic Yds.	Cubic Yds.
12	2152	2347	2543	4303	4499	4695
18	3374	3667	3960	6600	6894	7188
24	1941	5085	5474	8996	9388	9780
30	1914	6600	7087	11490	18066	12470

RAILWAY SWITCH STANDS AND BRACES

SWITCH STAND, TYPE S



FIG. 4237

RAIL BRACE, TYPE B



FIG. 4236

SWITCH STAND, TYPE G

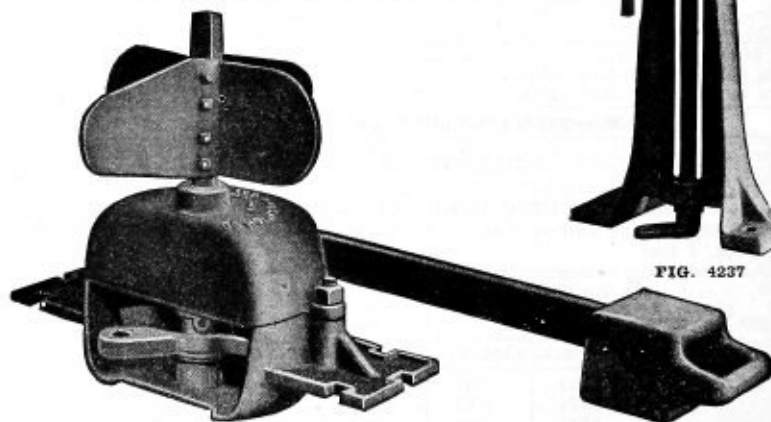


FIG. 4238

We will be pleased to submit estimates of cost upon complete railway track equipment.

PORTABLE TRACK, SWITCHES AND ACCESSORIES

Track



FIG. 4239

Steel Corrugated Tie



FIG. 4240

Steel Tie, with Clips and Bolts

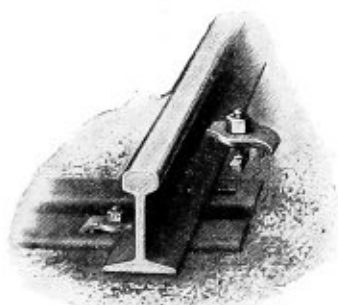


FIG. 4241

Patented Rail Shoe



FIG. 4242

Portable Switches



FIG. 4243

Permanent Switches



FIG. 4244

Frogs



FIG. 4245

See following page.

PORTABLE TRACK, SWITCHES AND ACCESSORIES— CONTINUED

Track built up of any weight rails up to 30 pounds, in sections 15 feet long, riveted on steel corrugated ties; curves of all radii, crossings and turnouts, complete with splice bars, or rail shoes, bolts and nuts.

Switches built any size, in right and left, two-way, three-way and symmetrical shapes.

Steel ties, clips and bolts any size.

STRAIGHT TRACK

Wt. of Rail Per Yd., Lbs.	Length of Section	Ties Per Section	Gage	List Price Per Foot of Track
12	15 ft. 0 in.	5	24 in.	\$1.24
16	15 ft. 0 in.	5	24 in.	1.32
20	15 ft. 0 in.	5	24 in.	1.52
25	15 ft. 0 in.	5	24 in.	1.92

CURVED TRACK

12	15 ft. 0 in.	6	24 in.	\$1.40
16	15 ft. 0 in.	6	24 in.	1.48
20	15 ft. 0 in.	6	24 in.	1.72
25	15 ft. 0 in.	6	24 in.	2.12

Less than 15 ft. 0 in. lengths, add to list \$0.15 per foot. Can also be furnished for other gages. Prices on request.

SWITCHES

Wt. of Rail Per Yd., Lbs.	Length of Section	Gage	List Price, Each
12	15 ft. 0 in.	24 in.	\$ 86.00
16	15 ft. 0 in.	24 in.	92.00
20	15 ft. 0 in.	24 in.	102.00
25	15 ft. 0 in.	24 in.	124.00

Can also be furnished for other gages. Prices on request.

Frogs are of plate riveted construction, securely fastened to heavy plate. Switch points are furnished complete with slide plates, tie bars, etc. State gage desired.

Ground-Throw for 12-16-20-25-pound Rails.....list price \$8.00
For Heavier Rails.....list price 8.80

PERMANENT SWITCHES

Wt. Rail	Points	List Price	Frog	List Price
16	5 ft. 0 in.	\$20.80	4 ft. 0 in.	\$19.60
16	6 ft. 0 in.	22.80	5 ft. 0 in.	21.60
20	5 ft. 0 in.	22.40	4 ft. 0 in.	21.20
20	6 ft. 0 in.	24.80	5 ft. 0 in.	23.60
25	5 ft. 0 in.	24.60	4 ft. 0 in.	23.20
25	6 ft. 0 in.	27.60	5 ft. 0 in.	26.00
30	5 ft. 0 in.	31.00	4 ft. 0 in.	26.40
30	6 ft. 0 in.	36.00	5 ft. 0 in.	32.40
35	5 ft. 0 in.	34.00	4 ft. 0 in.	30.80
35	6 ft. 0 in.	36.80	5 ft. 0 in.	37.60
40	5 ft. 0 in.	36.80	4 ft. 0 in.	36.80
40	6 ft. 0 in.	43.20	5 ft. 0 in.	43.20
45	6 ft. 0 in.	48.00	5 ft. 0 in.	46.80
45	7 ft. 6 in.	61.60	6 ft. 0 in.	54.80
50	10 ft. 0 in.	44.00	8 ft. 0 in.	46.00
50	12 ft. 0 in.	49.00	10 ft. 0 in.	50.00
56	10 ft. 0 in.	54.00	8 ft. 0 in.	55.00
56	12 ft. 0 in.	58.00	10 ft. 0 in.	60.00
60	10 ft. 0 in.	62.00	8 ft. 0 in.	64.00
60	12 ft. 0 in.	66.00	10 ft. 0 in.	69.00

Made for any gage.

CAST IRON BALL-BEARING TURNTABLES

No. 5257

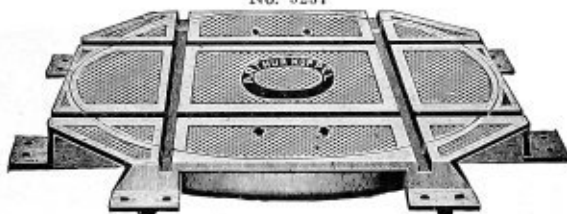


FIG. 4246

No. 5257 shows a grooved top cast iron turntable which is considered best for interior work. The turntable operates very easily, it being mounted on ball bearings; the top is checkered cast iron, having the track cast in it. The tracks are formed by corrugations on the top of the turntable, thus offering no obstruction to anything that might pass over it. This turntable is particularly suitable for use in cement or concrete floors and it is commonly used in boiler rooms, shops, foundries.

For 30 and 36 inch gage, add to list price.....\$15.00

Gage Inches	Diameter Inches	Maximum Load, Tons	Approximate Weight, Pounds	List Price
18, 20	40	3½	680	\$ 84.00
21½, 24	44	3½	820	92.00
21½, 24	48	3½-4	1,015	108.00
24, 30	52	3½-4	1,240	130.00
24, 30, 36	60	3½-4	1,435	148.00
24, 30, 36	72	3½-4	1,975	192.00

Note: 21½ inches refers to outside gage.

No. 5269



FIG. 4247

No. 5269 shows a cast iron flush top turntable used permanently for crossings at acute and obtuse angles. This turntable may be furnished with or without rails mounted on it, and the rails may be set for any gage if mounted. Specification below.

Gage Inches	Diameter Inches	Maximum Load, Tons	Average Weight, Pounds	List Price
For	52	3½-4	1,080	\$130.00
Gages	60	3½-4	1,215	148.00
18-36	72	4	1,820	192.00

Note: The weights and prices are for turntables without rails.

UNIVERSAL BALL BEARING TURNTABLES



FIG. 4248

No. 3



FIG. 4251

No. 1 "Universal." Serpentine track, ball bearing. Turntable is made with plain checkered top, without grooved track and without locking device.

No. 2 "Universal." Serpentine track, ball bearing. Turntable is made with grooved track top and with locking device.

No. 1



FIG. 4249

No. 2



FIG. 4250

"Universals" are neat, strong and substantially made. Weight distributed so as to reinforce parts subject to the greatest strain.

Due to the Serpentine ball bearing race course, fully 75 per cent of the friction is eliminated, accordingly "Universals" are easily turned by the efforts of one man even when loaded to full capacity of from five to six tons.

When inquiring for discounts and ordering, state style, number of tables required, gauge of track and wheel base of cars—or diameter of tables—if flange of wheels runs on the outside, state so, otherwise gauge is assumed to be inside of rails.

Number		1	2
3½ feet	18 to 24 gauge.....	\$ 58.00	\$ 64.00
4 feet	18 to 30 gauge.....	62.00	84.00
5 feet	18 to 36 gauge.....	69.00	91.00
6 feet	18 to 48 gauge.....	110.00	122.00
8 feet	48 and upward.....	280.00	290.00

No. 3 "Universal." Serpentine track, ball bearing. Turntable is same as No. 2 with guard rails additional.

LIST PRICES WITH LOCKING DEVICE AND GUARD RAILS

Number		
3½ feet	18 to 24 gauge.....	\$ 79.00
4 feet	18 to 30 gauge.....	99.00
5 feet	18 to 36 gauge.....	106.00
6 feet	18 to 48 gauge.....	137.00
8 feet	48 and upward.....	310.00

THE "WHITNEY WONDER" ROLLER BEARING TRUCK

Style W

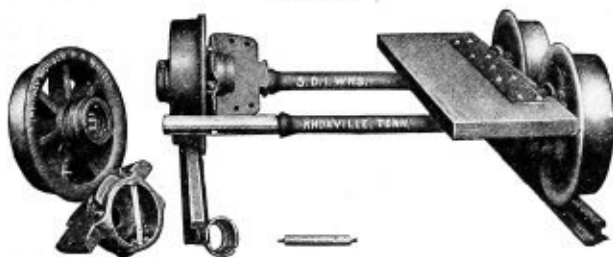


FIG. 4252

Style W is a mine car truck with Whitney Wonder Roller Bearing Wheels, for use on the ordinary mine car with wood or steel bottom. It has heavy wide winged 4 bolt boxes. List prices per table No. 72 on following page. The boxing has wider wings than those working inside channel irons. Inside plates holding axle parallel are furnished.

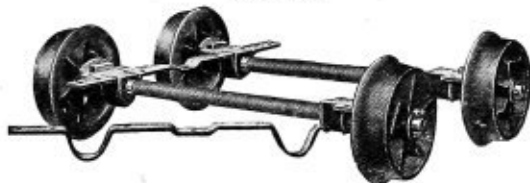
WHITNEY WONDER TRUCK
Style W.R.

FIG. 4253

This truck equipped with Whitney Wonder Roller Bearing Wheels; has pedestal boxes with 2 bolts each. Steel axle straps are furnished, going over top of pedestals, keeping axles parallel. This truck is listed (including axle straps) in price list No. 72.

To Order Any Truck Always Give Figure No. and

- | | |
|---|--|
| (1) Style of Truck. | (5) Size of Axle. |
| (2) Style of Wheel. | (6) Track Gage (the Exact Distance between Heads of Rails Inside). |
| (3) Diameter of Wheel (measured on tread). | (7) Sketch of Car Framing. |
| (4) Wheel Base or Distance Axles are Spaced Apart on Centers. | |

See tables on following page.

THE "WHITNEY WONDER" ROLLER BEARING TRUCKS

Note: Each truck is the running gear of a 4 wheel car and thus consists of 4 wheels with roller bearings, 2 axles and 4 boxings. Inside plates to hold axles parallel (illustrated Fig. No. 4252) are furnished at net extra price according to wheel base. (See price list 73, below).

Truck Style "W" is furnished on this price list with wide wing, 4 bolt boxes. Inside plates, which should always be used, are furnished at net extra as specified in price list No. 73.

Truck Style "W-R" is furnished at this price list complete with 2 steel axle straps as shown.

Diameter of Wheel in inches.		Size of Round Axle in inches.	Price List No. 72—Discounts on application. Each Truck Has 4 Heavy Duty "Whitney Wonder" Roller Bearing Wheels (Pat.)										Width of Tread of Standard Wheels.
			Gage 18 in.	Gage 24 in.	Gage 30 in.	Gage 36 in.	Gage 40 in.	Gage 42 in.	Gage 44 in.	Gage 48 in.	Gage 56 1/2 in.		
11	or	1 1/4	\$29.90	\$30.20	\$30.50	\$30.80	\$31.00	\$31.10	\$31.20	\$31.40	\$31.80	3 1/2 ins.	
11	or	1 1/2	31.60	31.90	32.20	32.50	32.70	32.80	32.90	33.10	33.50	3 3/4	
11	or	1 3/4	34.74	35.16	35.58	36.00	36.38	36.42	36.56	36.84	37.40	3 3/4	
11	or	1 1/2	40.38	40.92	41.46	42.00	42.36	42.54	42.72	43.08	43.80	3 3/4	
11	or	1 3/4	33.70	34.00	34.30	34.60	34.80	34.90	35.00	35.20	35.60	3 3/4	
11	or	1 1/2	37.14	37.56	37.98	38.40	38.68	38.82	38.96	39.24	38.80	3 3/4	
11	or	1 3/4	42.78	43.32	43.86	44.40	44.76	44.94	45.12	45.48	46.20	3 3/4	
11	or	1 1/2	48.02	48.68	49.34	50.00	50.44	50.66	50.88	51.32	52.20	3 3/4	
11	or	1 3/4	53.98	54.82	55.66	56.50	57.06	57.34	57.62	58.18	59.30	3 3/4	
13	or	1 1/4	35.90	36.20	36.50	36.86	37.00	37.10	37.20	37.40	37.80	3 3/4	
13	or	1 1/2	39.14	39.56	39.98	40.40	40.68	40.82	40.96	41.24	41.80	3 3/4	
13	or	1 3/4	41.78	42.32	42.86	43.40	43.76	43.94	44.12	44.48	45.20	3 3/4	
13	or	1 1/4	49.82	50.48	51.14	51.80	52.24	52.46	52.68	53.12	54.00	3 3/4	
13	or	1 1/2	55.68	56.32	57.36	58.20	58.76	59.04	59.32	59.68	61.00	3 3/4	
13	or	1 3/4	61.80	62.82	63.84	64.86	65.54	65.88	66.22	66.90	68.26	3 3/4	
13	or	1 1/4	67.60	68.80	70.00	71.20	72.00	72.40	72.80	73.60	75.20	3 3/4	
15		1 1/4	46.18	46.72	47.26	47.80	48.16	48.34	48.52	48.88	49.60	3 3/4	
15		1 1/2	51.32	51.98	52.64	53.30	53.74	53.96	54.18	54.62	55.50	3 3/4	
15		1 3/4	57.68	58.62	59.46	60.30	60.86	61.14	61.42	61.98	63.12	3 3/4	
16		1 1/4	46.88	47.42	47.96	48.50	48.86	49.04	49.22	49.58	50.30	3 3/4	
16		1 1/2	52.22	52.88	53.54	54.20	54.64	54.86	55.08	55.52	56.40	3 3/4	
16		1 3/4	58.80	59.62	60.46	61.30	61.86	62.14	62.42	62.98	64.10	3 3/4	
16		1 1/4	64.80	65.82	66.84	67.86	68.54	68.88	69.22	69.90	71.26	3 3/4	
16		1 1/2	70.40	71.60	72.80	74.00	74.80	75.20	75.60	76.40	78.08	3 3/4	
18		1 1/4	49.38	49.92	50.46	51.00	51.36	51.54	51.72	52.08	52.80	3 3/4	
18		1 1/2	54.52	55.18	55.84	56.50	56.94	57.16	57.38	57.82	58.70	3 3/4	
18		1 3/4	61.50	62.32	63.16	64.00	64.56	64.84	65.12	65.58	66.80	3 3/4	
18		1 1/4	67.80	68.82	69.84	70.86	71.54	71.88	72.22	72.90	74.26	3 3/4	
18		1 1/2	72.40	73.60	74.80	76.00	76.80	77.20	77.60	78.40	80.00	3 3/4	
20		1 1/4	66.00	66.72	67.66	68.50	69.06	69.34	69.52	70.08	71.30	3 3/4	
20		1 1/2	77.40	78.60	79.80	81.00	81.80	82.20	82.60	83.40	85.00	3 3/4	
22 1/2		1 1/4	71.00	71.72	72.56	73.50	74.06	74.36	74.62	75.08	76.30	3 3/4	
24		1 1/2	82.40	83.60	84.80	86.00	86.80	87.20	87.60	88.40	90.00	3 3/4	

NET PRICE LIST NO. 73

Net Cost Sheet (No Discount) and Weights of 2 Inside Axle Plates (Sufficient for One 4 Wheel Truck.)

By Wheel Base is Meant the Distance Axles Are Spread Apart on Centers

Size of Axle	Wheel Base	15in.	18in.	20in.	22in.	24in.	26in.	28in.	30in.	32in.	34in.	36in.	38in.	40in.
1 1/2 inch	Wt. of 2 Plates	8lbs.	8 1/2 lbs.	9 lbs.	9 1/2 lbs.	10 lbs.	10 1/2 lbs.	11 lbs.	12 lbs.	12 1/2 lbs.	13 lbs.	13 1/2 lbs.	14 lbs.	14 1/2 lbs.
1 3/4 inch	Price of 2 Plates	31c	33c	34c	36c	37c	39c	40c	42c	43c	45c	46c	48c	49c
2 inches	Wt. of 2 Plates	12 1/2 lbs.	13 lbs.	14 lbs.	15 lbs.	15 1/2 lbs.	16 1/2 lbs.	17 1/2 lbs.	18 lbs.	19 lbs.	20 lbs.	21 lbs.	22 lbs.	23 lbs.
2 1/4 inches	Price of 2 Plates	40c	42c	44c	46c	48c	50c	52c	54c	56c	58c	60c	62c	64c
2 1/2, 2 3/4 or 3 inches	Wt. of 2 Plates	14 lbs.	14 1/2 lbs.	15 lbs.	16 lbs.	17 lbs.	18 lbs.	19 lbs.	19 1/2 lbs.	20 lbs.	21 lbs.	22 lbs.	23 lbs.	24 lbs.
	Price of 2 Plates	44c	46c	48c	50c	52c	54c	56c	58c	60c	62c	64c	66c	68c

These inside axle plates run from pedestal box to pedestal box on inside of car, and are punched for four bolts, to correspond with holes in boxes. These inside plates (usually figured in car irons), should always be ordered with the "Whitney Wonder" Roller Bearing Trucks—Style W—for they securely fasten box to the car bottom, keep bolts from tearing through the wood, and furthermore they keep the axles spaced accurately parallel. They are sold separately from the truck, as the price depends on the wheel base, but in filling orders for "Whitney Wonder" Trucks we will always furnish them at the regular extra price unless advised to contrary.

SQUARE AXLE TRUCK—WHEELS

STYLE 1 OR 2

See Cuts Below

FIG. 4254
Truck Style C

PRICE LIST NO. 24

Price of Car Truck, Each Consisting of 4 Self-Oiling Wheels and 2 Square Axles. Axle Straps Not Included. Wheels and Axles Are Thoroughly Machined

Size of Axle Inches	Wheel Diameter Inches	Price Truck, Capped Wheels, Style 1						Price Truck, Wheels Style 2						Extra per truck for 1/2 in. wider Tread of Wheels Than Standard
		Track Gauge						Track Gauge						
		36 in.	40 in.	42 in.	44 in.	48 in.	56 1/2 in.	36 in.	40 in.	42 in.	44 in.	48 in.	56 1/2 in.	
1 1/2	8	.....	.....	.....	.....	.....	.....	\$13.96	14.22	14.36	14.48	14.84	15.36	\$0.30
1 3/4	8	.....	.....	.....	.....	.....	.....	15.36	15.72	15.90	16.08	16.44	17.16	.30
1 1/2	10	.....	.....	.....	.....	.....	.....	15.40	15.66	15.80	15.92	16.18	16.70	.40
1 3/4	10	.....	.....	.....	.....	.....	.....	16.90	17.26	17.44	17.62	17.98	18.70	.40
1 3/4	11	\$19.92	20.28	20.46	20.64	21.00	21.72	18.40	18.76	18.94	19.12	19.48	20.20	.44
1 3/4	12	21.80	22.24	22.46	22.68	23.12	24.00	20.28	20.72	20.94	21.16	21.60	22.48	.44
1 3/4	12	20.96	21.32	21.50	21.68	22.04	22.76	19.20	19.56	19.74	19.92	20.28	21.00	.48
1 3/4	12	22.84	23.26	23.50	23.72	24.16	25.04	21.08	21.52	21.74	21.96	22.40	23.28	.48
1 3/4	12	23.20	23.86	23.14	23.42	23.98	31.10	25.56	26.21	26.40	26.68	26.24	27.36	.50
1 3/4	12	31.70	32.40	32.75	33.10	33.80	35.20	30.00	30.70	31.05	31.40	32.10	33.60	.50
1 3/4	14	32.88	33.24	33.42	33.60	33.96	34.68	31.20	31.56	31.74	31.92	32.28	33.00	.54
2	14	24.76	25.20	25.42	25.64	26.08	26.96	23.08	23.52	23.74	23.96	24.40	25.28	.54
2	14	29.16	29.72	30.00	30.28	30.84	32.00	27.48	28.14	28.42	28.70	29.26	29.40	.66
2	14	33.60	34.30	34.65	35.00	35.70	37.10	31.90	32.60	32.95	33.30	34.00	35.40	.68
2	16	27.48	27.92	28.14	28.36	28.80	29.68	25.08	25.52	25.74	25.96	26.40	27.28	.62
2	16	32.84	33.40	33.68	33.96	34.52	35.64	29.84	30.40	30.68	30.96	31.52	32.64	.80
2	16	37.20	37.90	38.25	38.60	39.30	40.70	34.00	34.70	35.05	35.40	36.10	37.50	1.10
2	16	48.80	49.80	50.30	50.80	51.80	53.80	46.16	47.16	47.66	48.16	49.16	51.16	1.30
2 1/2	18	29.48	29.92	30.14	30.36	30.80	31.68	27.08	27.52	27.74	27.96	28.40	29.28	.70
2 1/2	18	34.92	35.48	35.76	36.04	36.60	37.72	31.80	32.36	32.64	32.92	33.48	34.60	.88
2 1/2	18	40.56	41.26	41.62	41.96	42.66	44.06	37.04	37.74	38.10	38.44	39.14	40.54	1.26
3	18	51.06	52.06	52.56	53.06	54.06	56.06	48.08	49.08	49.58	50.08	51.08	53.08	1.46

Self-Oiling Wheel, Style 1

Self-Oiling Wheel, Style 2

Dimension Diagram of Wheel



FIG. 4255



FIG. 4256

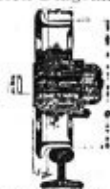


FIG. 4257

TO ORDER. Give (1) Style of Truck. (2) Style and diameter of wheel. (3) Track gauge. (4) Size of axle.

LUMBER TRUCKS

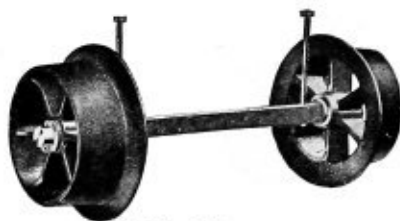


FIG. 4258

This shows the plain lumber truck wheel for wood rails. Made of good gray iron.

This wheel furnished for either round or square axle.

Price List No. 50

Price per Truck of 4 Wheels, and either 2 Square Axles or 2 Round Axles and 4 Solid Cast Iron Boxings

Diam. of Wheel Inches	Size of Axle Inches	KIND OF WHEEL		Approx. weight of each wheel Pounds	List Price Truck for 36-in. gage	Extra cost per truck for each extra inch of gage	Extra cost per truck for each 1/2-in. wider face of wheels	Approx. shipping weight of truck for 36-in. gage Pounds
		Fig. No.	Standard face of wh'l Inches					
14	1 3/4	58 a or b	5	90	\$28.80	\$0.10	\$0.54	430
14	2	58 a or b	5	94	31.64	.12	.54	475
14	2 1/4	58 a or b	5	98	35.32	.14	.54	520
14	2 1/2	58 a or b	5	102	39.12	.18	.54	560
15	1 3/4	58 a or b	5	120	36.00	.10	.60	550
15	2	58 a or b	5	124	38.84	.12	.60	590
15	2 1/4	58 a or b	5	128	42.32	.14	.60	640
15	2 1/2	58 a or b	5	132	46.32	.18	.60	680
16	2	58 a or b	5 1/2	134	41.24	.12	.70	600
16	2 1/4	58 a or b	5 1/2	136	44.44	.14	.70	650
16	2 1/2	58 a or b	5 1/2	140	48.24	.18	.70	700
18	2	58 a or b	5 1/2	140	42.68	.12	.80	650
18	2 1/4	58 a or b	5 1/2	144	46.36	.14	.80	700
18	2 1/2	58 a or b	5 1/2	148	50.16	.18	.80	750
20	2	58 a or b	6	156	46.52	.12	1.00	720
20	2 1/4	58 a or b	6	160	50.20	.14	1.00	770
20	2 1/2	58 a or b	6	164	54.00	.18	1.00	800
20	2	58 c	6	160	48.88	.12	1.00	740
20	2 1/4	58 c	6	164	52.56	.14	1.00	780
20	2 1/2	58 c	6	168	56.36	.18	1.00	825

To Order: Give track gage, style of wheel, diameter of wheel, size of axle, kind of axle, and if you use square axles state whether bolts or axle clips are to be used to hold truck to the car bottom. If you wish us to furnish the bolts give us the size of the timber to which the axle is to be bolted.

SPECIAL PRICES made on high flanged chilled iron wheels for either wood or steel rail, either tight or loose on axles.

WHEELS ON AXLES

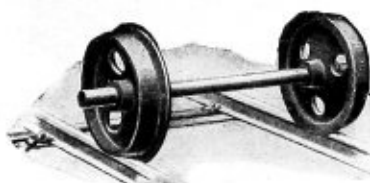


FIG. 4259

Can be furnished for any gage, diameter of wheel, round or square axle, inside or outside bearings, either plate or spoke wheels, of cast steel or chilled iron, tight or loose on the axle as desired.

Prices upon request.

PATENT ROLLER BEARINGS

Save about 50 per cent of traction power and 30 per cent of lubricating expenses. All cars are generally equipped with this type of Roller Bearing.



FIG. 4260

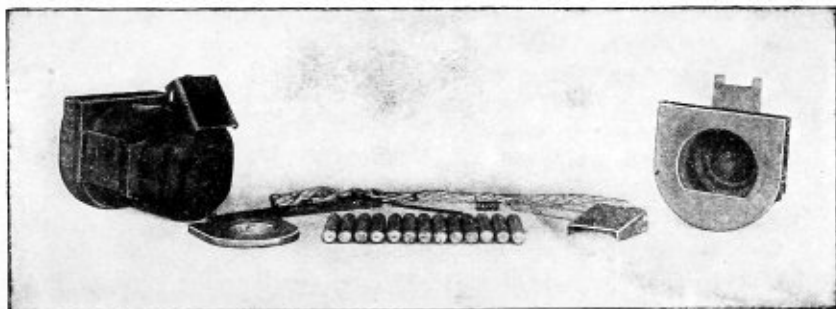


FIG. 4261

Price, either style.....each \$7.50

MINE CARS

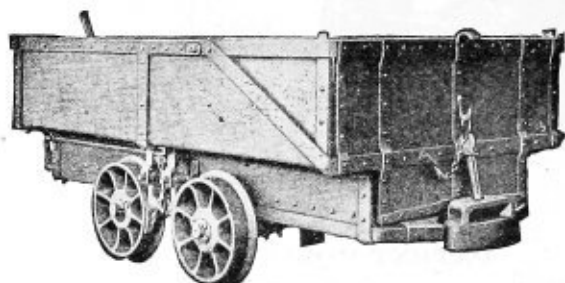


FIG. 4262

We are prepared to build in our own shops, Mine Cars, according to your specifications or our own designs.

Our shops are equipped with individual motor-driving machinery, all designed to turn out the very best Mine Cars at a reasonable price and we solicit your inquiries for cars, wood or steel or combination, with plain or roller bearing trucks.

ESSENTIAL SPECIFICATIONS ABOUT A CAR

- (a) Track gauge.
- (b) Capacity in cubic feet level full? (Average coal runs 40 to 50 cubic feet to the ton.)
- (c) Height from rail to top of side boards.
- (d) Length of car out to out of bumpers.
- (e) Couplings, yes or no.
- (f) Style of truck.
- (g) Diameter of wheels and style.
- (h) Lift gate or swinging gate like which car?
- (i) Bumpers, side or center?
- (j) With or without brake. (Single or double acting.)
- (k) Wood work complete or iron work only.
- (m) Single or double flare.

We can design a car if above specifications are furnished.

If particular about the details send for a complete specification blank.

SAFETY SHAFT CAGES

Self-dumping and solid platform types.

Prices quoted upon application.

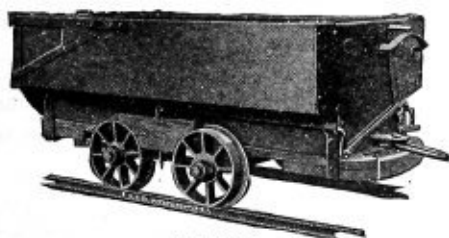


FIG. 4263

ALL STEEL OR COMPOSITE MINE CARS

For coal mines, quarries, cement and limestone plants, to suit capacity, gage, style door, brake, etc., desired.

Prices on application.

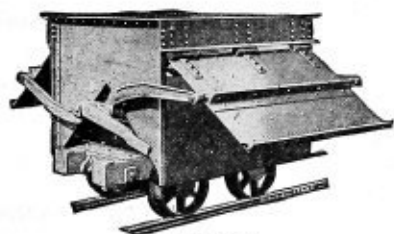


FIG. 4264

SPECIAL GABLE OR SADDLE BOTTOM DUMP CARS

One lever automatically operates the doors. Built of exceptionally strong construction, suitable for any gage and capacity desired. Can also be arranged for automatic trip for opening doors.

Special Gable Bottom Ore Cars

Prices upon request.

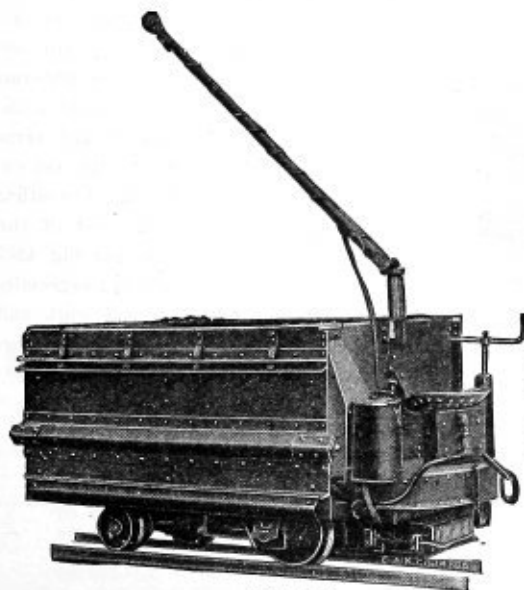


FIG. 4265

SPECIAL MOTOR DRIVEN GABLE BOTTOM DUMP CARS

Arranged for either trolley or third rail system. Built for any gage or capacity desired. Also special motor driven cars with other styles of bodies.

Prices upon request.

STANDARD ALL AROUND SCOOP DUMP CARS



FIG. 4266

Can be dumped to either end or either side by means of turntable upon which the body is mounted.

Gage	Capacity cu. ft.	Bearings	List Price
24	12	Roller in Hub	\$150.00
24	18	Roller in Hub	160.00
24	27	Roller in Hub	170.00

Can be arranged for other gages or roller bearings if desired.

For changing gage, add to list.....\$8.00

STANDARD DOUBLE SIDE STEEL CRADLE DUMP CARS



FIG. 4267

These cars are widely known on account of easy handling and automatic unloading feature, for handling loose material such as crushed stone, concrete, sand, excavated soil, coal, ashes, slack, scraps, farm products, etc. They are very light, yet exceptionally strong. Can be dumped to either side and discharge the load clear of the underframe and rails. Cars as per Fig. 4267 (36 cu. ft. capacity level full) are especially designed for light steam shovel work and light locomotive haulage. Cars can be furnished with screw brake if desired.

Gage	Capacity cu. ft.	Bearings	List Price
24 in.	18	Roller	\$225.00
24 in.	27	Roller	240.00
24 in.	36	Roller	268.00
30 in.	36	Roller	280.00

If Brake is desired, add to list price.....\$45.00

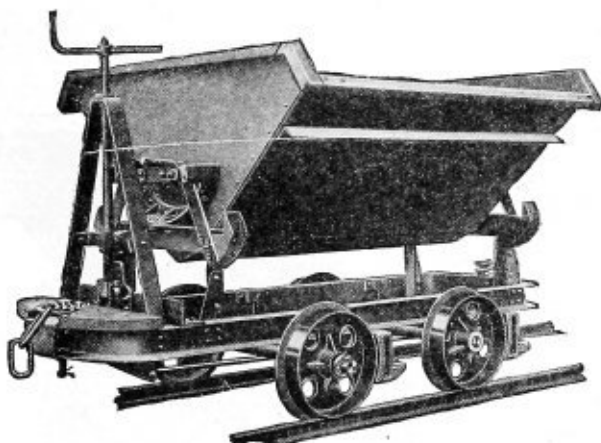
STANDARD LIGHT CONSTRUCTION ROCKER
DUMP CARS

FIG. 4268

Capacity, $1\frac{1}{2}$ and 2 cubic yards. For handling light materials, such as ashes, coal, coke, etc. Can be furnished with or without brake for 36 inch gage.

Gage	Capacity	Bearings	List Price
36	$1\frac{1}{2}$ cu. ft.	Roller	\$385.00
36	2 cu. ft.	Roller	480.00

For Brake, add to list price.....\$54.00

STANDARD PLATFORM CARS

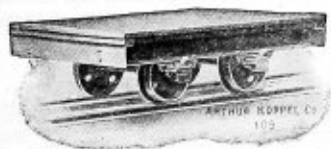


FIG. 4269

Constructed with strong underframe, having cast steel wheels, roller bearings and oak platform. Can be furnished with stake pockets and small couplers if desired.

Gage	Capacity	Lgth	Width	Height	Dia. Wheels	List Price
24 in.	2-3 tons	5 ft.	37 in.	14 $\frac{3}{4}$ in.	12 in.	\$100.00
24 in.	2-3 tons	6 ft.	4 ft.	14 $\frac{3}{4}$ in.	12 in.	108.00
30 in.	2-3 tons	6 ft.	4 ft.	16 $\frac{3}{4}$ in.	14 in.	125.00
36 in.	2-3 tons	8 ft.	6 ft.	16 $\frac{3}{4}$ in.	14 in.	150.00

Can furnish 24-inch gage with 14-inch wheels if desired.

Can also furnish special cars to any specification. Prices on application.

STANDARD HEAVY TYPE ROCKER DUMP CARS

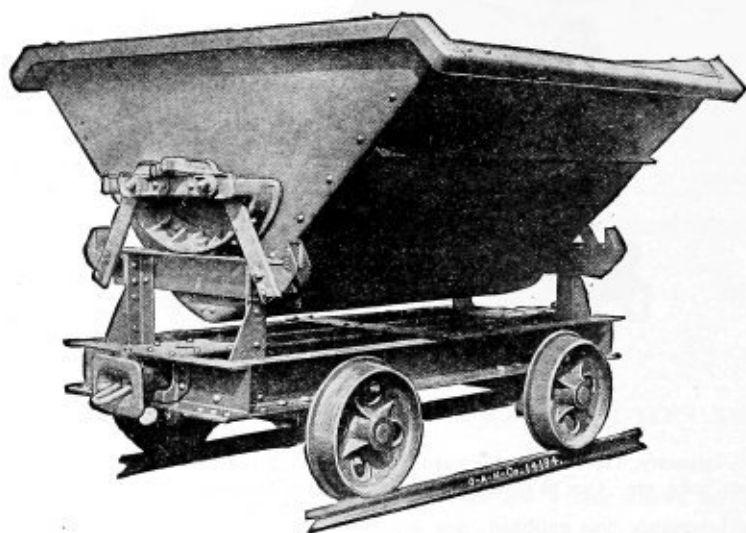


FIG. 4270

Designed and built for steam shovel loading and locomotive haulage. Equipped with spring draft gear and extra heavy running gears. Especially adapted to heavy contracting work and stone quarries. Can also furnish 2 yard car with low loading height of 3 feet 7 inches for hand loading. Can be furnished with or without brake.

Gage	Capacity	Bearings	List Price
36	2	Brass	\$385.00
36	3	Brass	On Request
36	4	Brass	On Request

For Brakes add to list price.....\$76.00

STANDARD FUEL CARS



FIG. 4271

For handling coal in boiler rooms. Designed suitable for shoveling coal from car into fire doors. Equipped with steel wheels and roller bearings. Built with one or two doors.

Gage	Capacity	Doors	Bearings	Price List
24	20 cu. ft.— $\frac{1}{2}$ ton	1	Roller	\$230.00
24	40 cu. ft.—1 ton	1	Roller	270.00

For car with two doors, add to list price. \$60.00

Special Cars, prices on application.

TRANSFER CARS

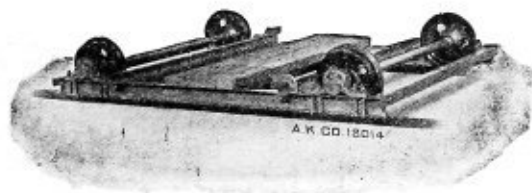


FIG. 4272

Above shows Standard Single-Track Transfer Car. The sills are made of 5 inch channel connected by end ties and diagonal braces of $1\frac{1}{2}$ inch by $\frac{1}{2}$ inch. Cross track is of 16 pound rails. Wheel chocks and car stop are provided. Floor of $1\frac{3}{4}$ inch oak between the rails. Wheels are cast steel, 14 inch diameter, axles $1\frac{3}{4}$ inch steel, bearings are heavy type. These cars can be provided, if desired, with a handle and brakes.

Gage Transfer Car.....	4 feet
Gage Top Track.....	24 inches
Width	5 feet
Length	5 feet 5 inches
Height from top of rail to top of rail.....	6 $\frac{1}{4}$ inches
Weight	660 pounds

Can also furnish Transfer Cars with double track for handling two cars at one time, or special cars to any specification.

Single Track	list price \$125.00
Double Track	list price 170.00

**NO. 6 PUSH CAR
STEEL WHEELS**

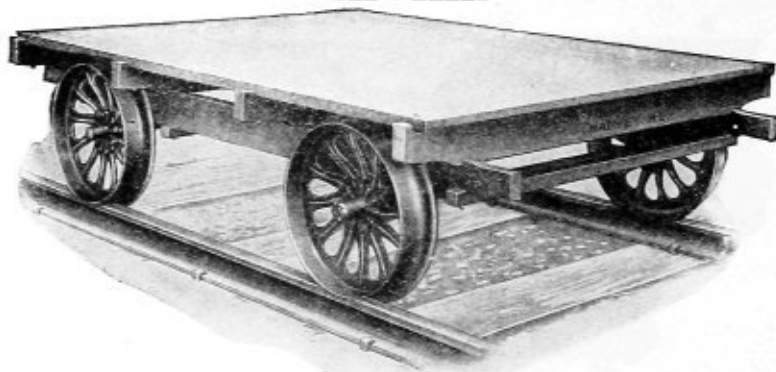


FIG. 4273

TAPER WHEEL FIT

Standard gauge; platform 7 feet long by 5 feet 7 inches wide; wheels, 20 inches diameter; machine steel axles, 1½ inches diameter. Weight, 500 pounds.

All our push cars may be furnished insulated, the method being exactly the same as used on our hand cars.

Prices on application.

**NO. 6½ PUSH CAR
EXTRA HEAVY**

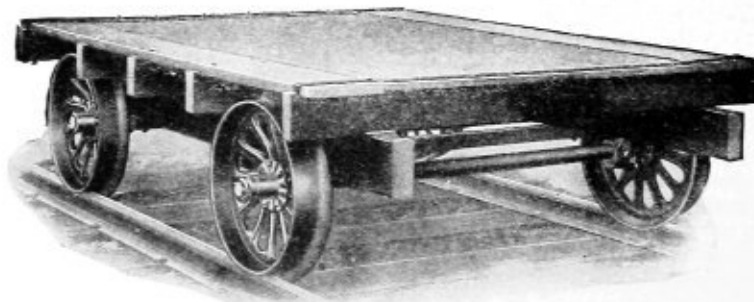


FIG 4274

TAPER WHEEL FIT

This is a very strong car and is intended for heavier work than the No. 6. It is unusually durable, the sills and stringers being of extra thickness and it has the addition of heavy iron straps across each end on the platform. The axles are also heavier, being 2 inches in diameter.

Standard gauge. Platform 5 feet 7 inches wide. Has 20-inch wheels.

Weight, 700 pounds.

Furnished with insulated wheels upon specification.

Prices on application.

SPECIAL LIGHT WEIGHT CARS for delivery purposes made to your specifications.

SPECIAL PLATFORM CARS

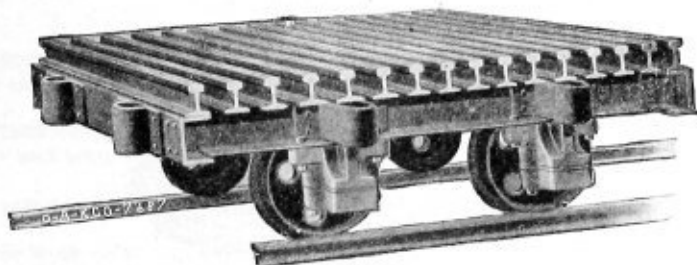


FIG. 4275

Special Platform Cars for all purposes. Cut shows car designed for handling ingots and billets. Can be built to any specifications. Prices upon application.

STANDARD PUSH CARS

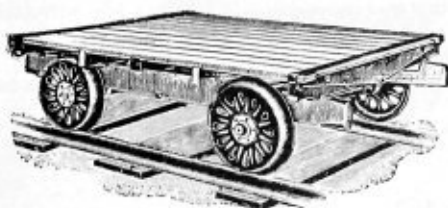


FIG. 4276

Standard Push Cars for capacity one ton, built for standard gage, 4 feet 8½ inches. Equipped with pressed steel wheels. Length, 7 feet, width 5 feet 7 inches.

List price\$120.00

SPECIAL PIG METAL CARS

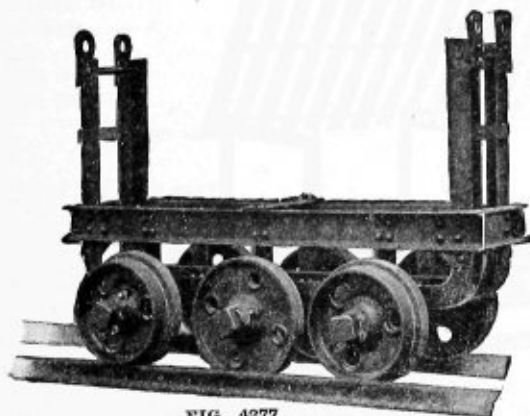


FIG. 4277

Designed for handling pig metal on either track or floor. Also arranged so that load and car can be lifted and handled by crane. Cast steel wheels with rollers in hubs to facilitate easy handling.

Prices on application.

STANDARD DRYER CARS
FOR BRICK YARDS

No. 12000

Single-deck dryer car without deck

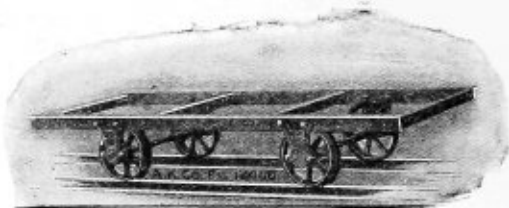


FIG. 4278

No. 7712

Single-deck dryer car with deck

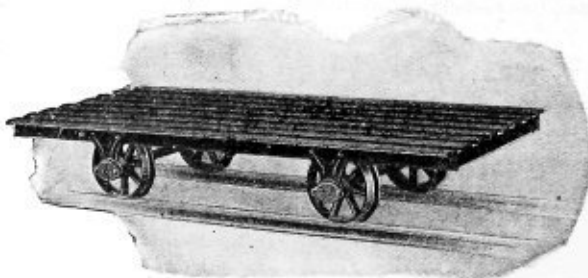


FIG. 4279

No. 7713



FIG. 4280

For description and specifications, see following page.

STANDARD DRYER CARS—CONTINUED

FOR BRICK YARDS

Our Single-Deck Dryer cars are supplied (a) without decks, as per No. 12000; (b) with channel steel deck, as per No. 7712, shown on opposite page.

Our Double-Deck Dryer cars are supplied (a) without decks; (b) with bottom deck; (c) with bottom deck and removable top deck.

The cars are made of a first-class quality of steel and iron.

Frame Work—Side bars are made of $3 \times 2\frac{1}{2} \times \frac{1}{4}$ inch angles riveted to four cross braces of angle steel, $2 \times 1\frac{1}{2} \times \frac{1}{4}$ inch, with angle clips. Each cross piece is secured to side bars by rivets.

Uprights are made in one piece of $1\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{8}$ inch angles and are supported with our Special Pressed Steel Gusset Plates.

Bottom Decks are made of 6 pieces of channel steel $2\frac{1}{2} \times \frac{1}{2}$ inch, running lengthwise and placed $2\frac{1}{8}$ inches apart.

Removable Top Decks are made of 16 pieces of channel steel, $2\frac{1}{2} \times \frac{1}{2}$ inch, riveted crosswise to 3 angles $1\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{8}$ inch.

Wheels and Axles—The wheels, which have a diameter of $10\frac{1}{2}$ inches, are made of cast-iron; the axles are of $1\frac{1}{2}$ inch diameter and are made of special axle steel.

SPECIFICATIONS, SINGLE-DECK CARS

Length over all.....	6 feet 11 inches
Width over all.....	2 feet 11 inches
Track Gage.....	24 to 26 inches
Height.....	1 foot 1 inch
Weight, No. 12000.....	255 pounds
Weight, No. 7712.....	330 pounds

Can also furnish special cars to any specification.

No. 12000.	24 inch gage.....	list price	\$35.00
	25 inch gage.....	list price	36.00
	26 inch gage.....	list price	37.00
No. 7712.	24 inch gage.....	list price	40.00
	25 inch gage.....	list price	41.00
	26 inch gage.....	list price	42.00
No. 7713.	24 inch gage.....	list price	60.00
	25 inch gage.....	list price	61.00
	26 inch gage.....	list price	62.00

Can also furnish special cars to any specification. Prices on application.

SOFT MUD RACK CARS FOR BRICK YARDS

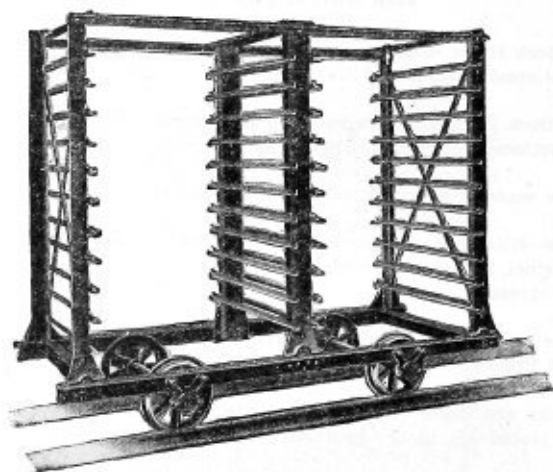


FIG. 4281

Can be used for either wood or steel pallets. Running gear and bearings same as on Standard Dryer Cars shown on previous page. Length 6 feet 8 inches, width 3 feet, height 5 feet 10 inches, weight 510 pounds. Can also furnish special cars to specification.

24 inch gage.	Distance between pallets $4\frac{3}{4}$ inches clear.....	list price	\$57.00
25 inch gage.	Distance between pallets $4\frac{3}{4}$ inches clear.....	list price	59.00
26 inch gage.	Distance between pallets $4\frac{3}{4}$ inches clear.....	list price	61.00

SPECIAL SAND LIME BRICK CAR

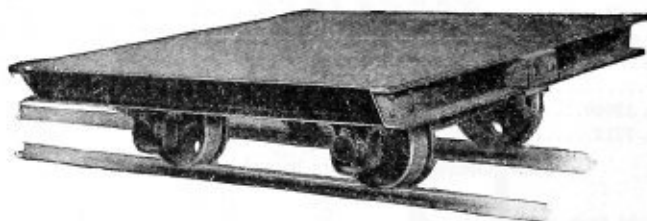


FIG. 4282

This type of car is made with steel plate top, which is absolutely level and used for sand lime brick and special purposes. Frame is made of 4 inch channels with $\frac{1}{4}$ inch floor plate fitted with 12 inch diameter cast steel wheels and roller bearings; or where the space between the rails is needed, self-oiling wheels are used with an axle and two bearings to each wheel. Link is provided at each end for coupling.

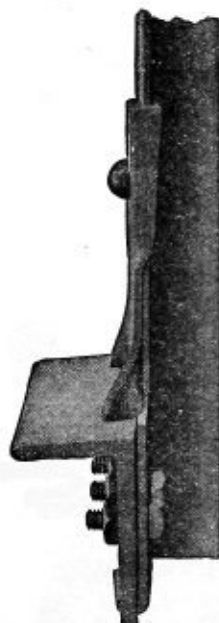
Specifications—Length over all 3 feet 2 inches. Width over all 5 feet 3 inches. Height to top of platform $13\frac{1}{2}$ inches. Gage 28 inches. Special cars of any gage and size can be furnished.

Prices upon application.

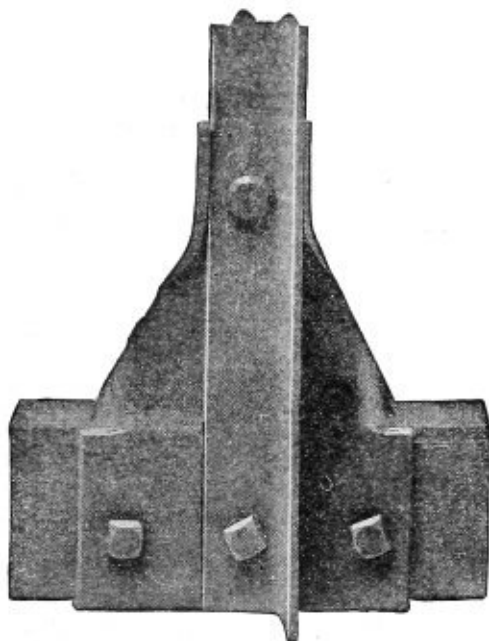
PATENTED PRESSED STEEL GUSSET PLATE

FOR BRICK AND DRYER CARS

No. 12010

**FIG. 4283**

No. 12009

**FIG. 4284**

The No. 12009 and No. 12010 show Special Pressed Steel Gusset Plates for inside and outside uprights.

These plates provide a perfectly rigid support for the uprights and absolutely prevent rocking in any direction. This gusset brace has the unqualified approval of many brick manufacturers, who state that it is the most rigid and yet the most simple brace they have ever seen on any dryer car.

The advantages of this pressed steel plate over a casting are:

First—It is not possible to make a casting fit neat and close and therefore there will always be rocking in all directions and poor support for the uprights when a cast brace is used.

Second—This pressed steel gusset brace is made the same size as the cast piece, but the material used permits the assembler to hammer all edges tight to connected parts; this, of course, cannot be done with a cast brace.

Price\$.....

No. 1 STANDARD HAND CAR

STANDARD GAUGE

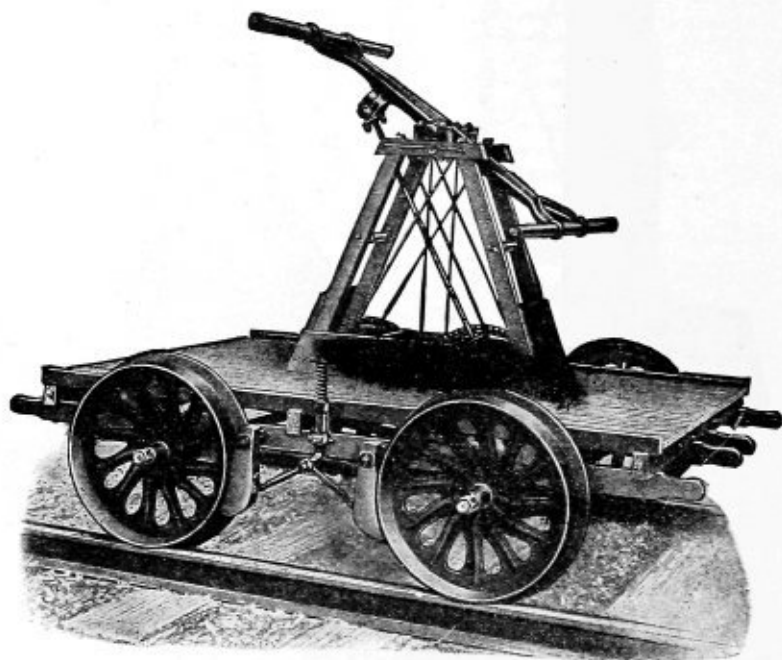


FIG. 4285

Standard gauge; platform 6 feet long by 4 feet 5 inches wide; axles $1\frac{1}{8}$ inches in diameter; weight 525 pounds.

Fitted with Buda pressed steel wheels; diameter 20 inches. For roads having block signals with track circuit, we can furnish insulated. Our method of insulation is fully approved by all signal companies.

Prices on application.

HUNTINGTON STANDARD TRACK GAUGE WITH AND WITHOUT INSULATION



FIG. 4286

This is the ordinary pattern Huntington Gauge. The construction is less expensive than our best grade; the heads simply being riveted on, and the ends are not milled. Made in insulated and non-insulated styles. Unless specified we ship without insulation.

List price, without insulation.....per dozen \$18.00
List price, with weather-proof insulation.....per dozen 25.50

BUDA WOODEN TRACK LEVEL WITH AND WITHOUT INSULATION



FIG. 4287

Made of white pine with three coats of paint, thus overcoming the tendency to warp and twist shown in common maple levels. It is thoroughly bound in steel. Shows proper distance to set guard rails.

List price, without insulation.....per dozen \$25.50
List price, insulatedper dozen 25.50

MCMANUS GAUGE AND LEVEL



FIG. 4288

The gauge glass has rubber packing which protects it, and greatly lessens the likelihood of levels being broken by rough and careless handling.

List priceper dozen, \$52.50

MCMANUS INSULATED GAUGE



FIG. 4289

This gauge has no level, but is insulated.

List priceper dozen \$30.00

"PITTSBURGH" STANDARD JIM CROW RAIL BENDER

FIG. 4290

Made from best grade O. H. Steel, with machine cut, square thread, steel screw, either with or without lever. Most compact and simplest device for bending and straightening rails.

No.	Will Bend Rail, Lbs.	Weight Lbs.	Price With-out Lever
0	12 to 20	40	\$ 5.00
1	25 to 40	65	9.00
2	50 to 65	85	12.00
3	70 to 80	130	13.00
4	85 to 95	155	15.00
5	100 to 110	190	17.00

"PITTSBURGH" RATCHET RAIL BENDER

FIG. 4291

Used largely in coal mines for bending and straightening rails.

No.	Will Bend Rail, Lbs.	Weight Lbs.	List Price
1	12 to 20	50	\$19.00
2	30 to 40	70	22.00
3	45 to 65	110	27.00
4	70 to 85	170	32.00

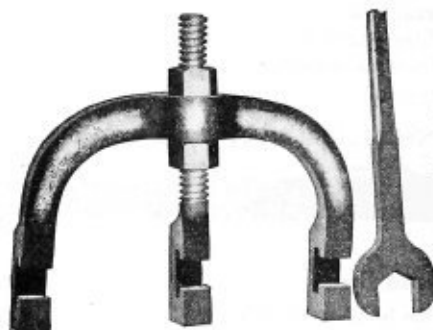
"PITTSBURGH" DOUBLE-ACTING RAIL BENDER

FIG. 4292

Made from best grade O. H. steel, with machine cut, square thread, steel screw, and steel wrench. This bender can be operated in a smaller space than any other bender, and will bend both large and small rails, pipe or iron.

No.	Will Bend Rail, Lbs.	Weight Lbs.	Price With Wrench
1	12 to 20	75	\$22.00
2	25 to 40	100	24.00
3	45 to 55	150	30.00
4	60 to 70	200	40.00

EMERSON RAIL BENDERS

TEE



FIG. 4293

STREET



FIG. 4294

UNIVERSAL



FIG. 4295

TEE RAIL BENDER

No. 1, for rails up to 45 pounds to yard and 5½ inches in height.

No. 2, for rails 45 to 65 pounds to yard and 6 inches in height.

No. 3, for rails 65 to 90 pounds to yard and 6 inches in height.

No. 4, for rails 90 to 115 pounds to yard and 6 inches in height.

STREET RAIL BENDER

The No. 4 Machine cares for rails up to 115 pounds to the yard and 9 inches in height. The No. 5 cares for rails 115 to 150 pounds to the yard and 9 inches in height. Both these machines, if supplied with proper jaw dies adjustable to fit into the rails, will care for both tee and girder patterns of rails. The No. 5 is made to order only.

UNIVERSAL RAIL BENDER

For surface bending and line curving. Only one size of this machine made, the No. 4, which cares for rails up to 100 pounds to yard and 6 inches in height.

To line curve rails, these machines must be supplied with proper adjustable jaw dies, which form part of the jaws, and fit into the rails.

When ordering, send BLUE PRINTS or TRACINGS OF RAILS and be sure to state STYLE AND SIZE of machine wanted.

READING RAIL BENDER



FIG. 4296

A Bender for All Sections and Weights of Rails

Size	AA	A	B	C	D
For all rails up to and including..... pounds	45	60	80	100	150
Weight	26¼	48	93¾	115	150
Price	each \$15.40	18.00	26.40	29.15	42.35

THE DAYTON SELF ADJUSTING CAR WRENCH



Fits All Winding Taps



FIG. 4297

For dumping and winding up the pockets of hopper and drop bottom coal cars.

Fits all winding taps, is self-adjusting without adjustments, and the jaws are so arranged that the harder the pull, the tighter it grips.

Absolutely safe to use when dumping cars, as the loose jaw will release when tap spins toward the operation.

Made in two sizes.

42-inch leverage	\$3.50
54-inch leverage	5.00

ALDON PORTABLE RAIL SAW

SUITABLE FOR T RAILS SIX INCHES OR LESS

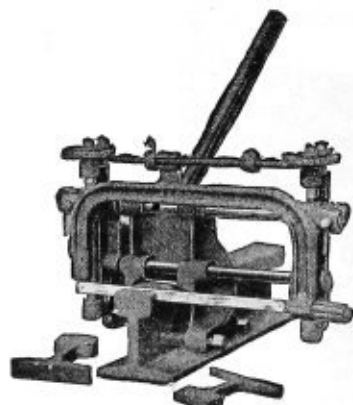


FIG. 4298

A portable saw weighing 55 pounds, easily handled and easily attached to rail.

Produces a clean, straight cut, and will not break blades.

Automatic feed, variable and adjustable.

Will slice off pieces of rail $\frac{1}{8}$ -inch thick if desired.

Price complete, with one dozen blades, \$60.00

HYDUTY PAULUS TRACK DRILL



FIG. 4299

Hyduty Paulus Drill in working position. Four styles of clutches.

Cut shows the Hyduty Paulus with Rich spindle and chuck, and with over-chuck. This is the latest development in track drills. Has variable feed; dust-proof ball-bearing thrust; small crank for feeding bit to and from work quickly. Frame and base are of T Section, making drill firm and suitable for the heaviest work. The gears are arranged so that the operator may exert greater power with less effort than heretofore.

Without charge we furnish in place of clutch shown, special clutch P63 for drilling holes close to end of rail; or under clutch P66.

Weight, 95 pounds.

Price, equipped with Rich spindle, chuck and one Rich flat bit.....\$30.00

Equipped with spindle for twist bits only, one twist bit included..... 25.00

For drilling high T, or girder rails, hook P52 is furnished in place of those illustrated, extra, \$2.50.

ALDON BELAND RATCHET DRILL

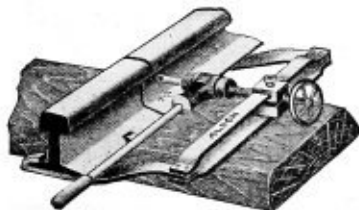


FIG. 4300

A handy tool for drilling rails. Weight 25 pounds each.

Price, completeeach \$8.00

Price, Frame onlyeach 4.00

Price, Ratchet onlyeach 4.00

Flat Bits for same.....per dozen 9.00

THE "IXL" TRACK DRILL

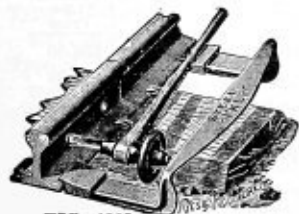
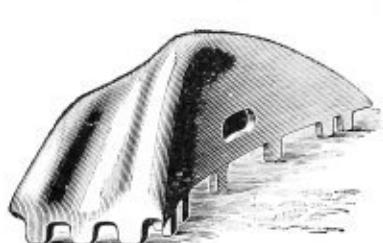


FIG. 4301

One Taper Square Shank Bit furnished with each drill, either $\frac{1}{2}$, $\frac{3}{8}$, $\frac{1}{4}$, $\frac{7}{16}$, 1 or $1\frac{1}{2}$ inch.

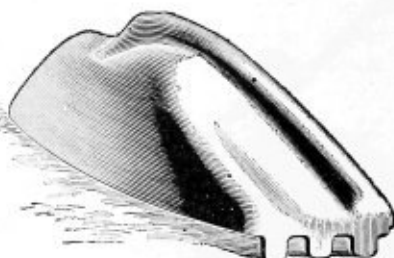
Price, complete\$8.00

ALEXANDER CAR REPLACER



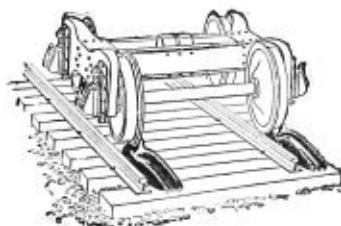
INSIDE REPLACER.

FIG. 4302



OUTSIDE REPLACER.

FIG. 4303



Look them over. They are built on right lines to do the business.

If you have used them then you know how handy they are at derailments. If you have not used them ask your practical man what he thinks of them.

We manufacture them from steel plate and guarantee them to retail your heaviest equipment.

The interest on the investment of equipping your train with this device is 85 cents per year. Can you save this amount in cost at any single derailment?

Figure out your cost at next derailment in loss of service of equipment and time of men delayed. It will surprise you.

Do not think because we do not load up with weight that we cannot do the work. You know the strength of steel plate compared with cast iron and cast steel. Give us a trial. 59,000 pair in service.

This work has to be done at night as well as by day. Give the men a tool they can handle. They all like the Alexander.

THE BEST WRECKING FROG ON THE MARKET

	List Price
No. 1 Replacer—160 lbs. per pair, high enough for six inch rail.....	\$36.00
" 2 " —150 " " " " " " " five " "	36.00
" 3 " —50 " " " suitable for traction companies, mine engines, steam and electric and rope haulage.....	28.00
" 1 Extra—Made of 3/4-inch plate, weight 212 lbs. per pair, guaranteed to carry 250 tons.....	44.00

JOHNSON CAR REPLACERS

Type Z, A or B, left hand

Type C and M, right hand



FIG. 4304



FIG. 4305

In general use by standard and logging railroads, mines and contractors.

THE JOHNSON FROG

Straddles the rail—needs no spikes, clamps or fasteners.

Rests on rail both front and rear.

Adjusts itself to different heights of rail.

Forms a friction grip with rail during the operation.

Brings rails to gauge during replacement.

Distributes the load on the rail, not one or two ties.

Special types for steel ties and street car rails.

	Throat Opening, Inches	Weight, Each	Price, Per Pair
Type M for rail 12-45 pounds if not over 3½ inches high, capacity 20-ton locomotive.....	2	30	\$20.00
Type C for rail up to 65 pounds if not over 4½ inches high, capacity 30-ton locomotive.....	2½	60	25.00
Type B for rail up to 80 pounds if not over 5½ inches high, capacity 50-ton locomotive.....	3¼	110	33.00
Type A for rail up to 100 pounds if not over 5¾ inches high, capacity 80-ton locomotive.....	3½	145	37.00
Type Z for rail up to 100 pounds if not over 6 inches high, capacity 100-ton locomotive.....	3½	165	40.00
Type AA for rail up to 100 pounds if not over 6 inches high, capacity 200-ton wreck outfit.....	3½	275	66.00

THE M. & M. RAIL CLAMP

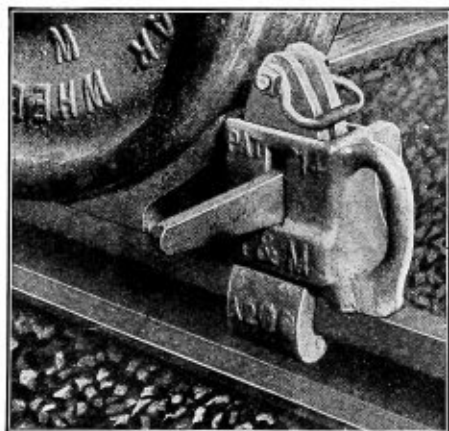


FIG. 4306

FOR THE PROTECTION of lives and property the M. & M. Rail Clamp is the safest, surest temporary stop for use when repairing cranes.

Can be applied or removed from rail in a minimum of time on short jobs where workmen would be inclined to take a chance. This is of vital importance.

This style of clamp fits any rail, worn or new, ranging from 40 pounds to 110 pounds. Replaces a half dozen chocks. One accident or derailment will cost more than a full equipment of clamps.

Priceeach \$15.00

"NEW BADGER" NO. 5 CAR MOVER

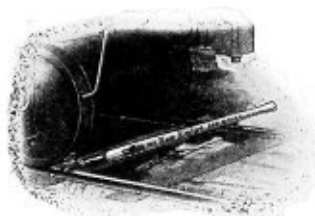


FIG. 4307

Here's a Car-Mover that will actually cut expenses in your shipping department. One man with a "NEW BADGER" Car-Mover will spot the heaviest, all steel, 50 ton capacity—no need to call the whole crew.

The "NEW BADGER" will put your cars up to the loading platform or door with the least possible time and effort expended. It gets the cars where you want them, and on time.

A toggle joint leverage provides a force that will move any car, and the concave spurs straddle the corners of the rail in an inverted "V" shaped manner—causing the "NEW BADGER" to cling to the rails with a vise like grip, so that every bit of energy is utilized to force the car forward.

Price, with extra spur.....	each \$6.00
No. 7. Cam or toggle, with rivet.....	.75
No. 8. Socket complete, with bolt.....	2.00
No. 9. Shoe, with spurs and bolt.....	2.00
Handle, finished	1.50
Never-Slip spurs	per set .30

Weight 15 pounds.

THE ATLAS CAR MOVER



FIG. 4308

Most powerful Car-Mover made. Moves any car with use of but one mover.
Weight 20 pounds, length 6 feet.....price, each \$5.00



FIG. 4309

One extra set of spurs with every Car-Mover gratis. Made with single straight spur or double spur, set at an angle. Please state which kind is desired. When ordering spurs to replace those worn out by long use please state exact size and shape of ones wanted.

PRICE LIST FOR REPAIRS

No. V. Link, with 2 rivets.....	\$0.50
No. VI. Arch Lever, or Knee, 2 rivets.....	.50
Roller Knee	.75
Roller	.25
No. VII. Socket, with bolt and 1 rivet.....	1.50
No. VIII. Shoe, with bolt and 1 rivet.....	1.50
No. X. Shoe, with bolt and 1 rivet.....	1.50
Handle	1.00
Plate or Clamp.....	.25
Spur, or Heel, single $\frac{1}{2} \times 2\frac{1}{2}$	.25
Double or two piece Spur, per pair, $\frac{1}{2} \times 1\frac{1}{4}$ inches.....	.25
Triangular Spur, old style $\frac{3}{4} \times 2\frac{1}{2}$ inches.....	.25

NEW NEVER SLIP CAR MOVER



FIG. 4310

This Mover is light, weighing 15 pounds; is 5½ feet long and intended for use on ordinary cars. Has quick action and gets under lowest cars. Will not slip on icy or greasy rails. Is equipped with a double or 2-piece spur, set at an angle, which grips the side of the rail, where it is soft, and will not slip.

Price, with extra spur.....each \$5.00

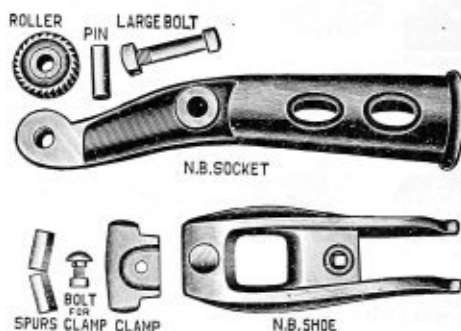


FIG. 4311

PRICE LIST OF REPAIRS

N. B. Shoe, with bolt.....	\$1.50
N. B. Socket, with bolt.....	1.50
C. B. Clamp, with bolt.....	.25
Bolt for Clamp.....	.05
Bolt for Shoe.....	.05
Roller.....	.35
Pin for Roller.....	.05
Double or 2-piece Spur, set.....	.25
Handle, finished.....	1.00

When ordering spurs, be sure to give exact size of the ones wanted.

SHELDON CAR MOVER

The great advantage of this MOVER is in its COMPOUND LEVERAGE which makes it easy for one man to move the heaviest cars. Lever and shoe are malleable iron, heel and toe plates highest grade tool steel, interchangeable and reversible.

List priceeach \$5.00



FIG. 4312

REPAIR PARTS

Lever, \$2.50; Shoe, \$2.50; Heel, 25c; Large Toe Plate, 15c; Small Toe Plate, 10c.

THE SAMSON CAR MOVER



FIG. 4313

The leverage of this Mover being compound, as soon as pressure is brought to bear upon the handle the two points will come in contact with the car wheel at the proper rolling distance from the point where the wheel rests on the rail, and in consequence the car wheel is immediately forced to turn instead of being lifted from the track as is the case with the ordinary pinch-bar and even many makes of modern Car Movers.

List Priceeach \$5.00

REPAIR PARTS

0—Cam	\$0.20	9—Triangular Spur $\frac{1}{2}$ "x3"	\$0.25
2—Wood Handle	1.00	11—Clamp	.20
3—Square Spur $\frac{1}{2}$ "x3"	.25	A—Clamp Bolt	.05
4—Spring	.25	B—Shoe Bolt	.05
5—Arm with Cam	1.50	C—Shoe Rivet	.03
6—Shoe for Triangular Spur	1.25	D—Cam Pin	.03
8—Shoe for Square Spur	1.25	Complete Mover	5.00

Complete Mover Weighs 15 lbs.

SAMSON LOCOMOTIVE CAR MOVER

Same as above, except heavier.....list price, each \$6.00

THE EASY CAR PUSHER

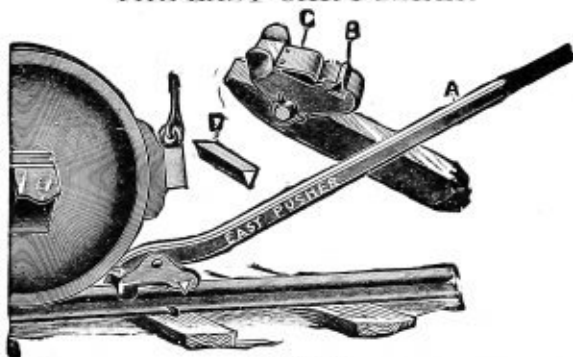


FIG. 4314

Price, Easy Pusher.....each, \$5.00

Price, extra steelseach, .20

TUBULAR STEEL LEAD BAR DOUBLETREES

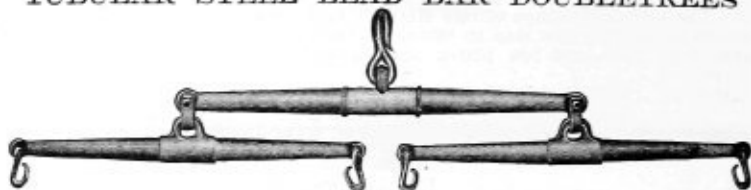


FIG. 4315

No. 201-A—Price includes center hook, clevises, bolts and keys.

Size	Doubletree Inches	Singletree Inches	Weight Dozen Sets, Lbs.	Per Dozen	Per Dozen Sets
1	34	26	180	\$.....	\$.....
2	36	30	240	.....	.....
3	38	32	264	.....	.....

No. 204 TUBULAR STEEL NECK YOKE



FIG. 4316

Size 1—35-inch	per dozen \$.....
Size 2—40-inch	per dozen
Size 3—44-inch	per dozen

No. 206-C PLOW SINGLETREE



FIG. 4317

With perpendicular center and safety hooks.

Size	1	2	3	4	5
Inches	22	24	26	28	30
Weight per dozen...lbs.	33	36	42	48	54
Per dozen	\$.....	\$.....	\$.....	\$.....	\$.....

No. 206-A TUBULAR STEEL PLOW OR WAGON SINGLETREE



FIG. 4318

Size	1	2	3	4	5	6	7	8
Inches	22	24	26	28	30	32	34	36
Wght per doz.lbs.	33	36	42	48	60	66	84	96
Per dozen	\$.....	\$.....	\$.....	\$.....	\$.....	\$.....	\$.....	\$.....

No. 205 TUBULAR STEEL BREAST YOKE

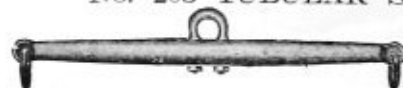


FIG. 4319

Size	1	2	3
Inches	20	22	24
Per dozen.....	\$.....	\$.....	\$.....

WAGON HARDWARE **FOR SINGLETREES AND DOUBLETREES,**

STRAIGHT CLIPS

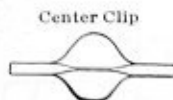


FIG. 4320



FIG. 4321

			Size of Round Part In.	Total Length In.	Price per Hundred
No. 10.	Center	.....	$\frac{3}{4}$	13	\$14.50
No. 11.	Center	.....	$\frac{3}{4}$	12	13.30
No. 12.	Center	.....	$\frac{7}{8}$	11	8.50
No. 13.	Center	.....	$\frac{1}{2}$	10	6.80
No. 14.	Center	.....	$\frac{1}{2}$	9	5.20
No. 15.	Center	.....	$\frac{1}{2}$	8	4.20
No. 16.	End	.....	$\frac{5}{8}$	11	8.20
No. 17.	End	.....	$\frac{1}{2}$	10	6.50
No. 18.	End	.....	$\frac{1}{2}$	8 $\frac{1}{2}$	5.00
No. 19.	End	.....	$\frac{1}{2}$	7 $\frac{1}{2}$	3.90
No. 20.	End	.....	$\frac{3}{8}$	7	3.20

WELDED CLIPS



FIG. 4322



FIG. 4323

			Size of Round Part In.	Price per Hundred
No. 22.	Center	.....	$\frac{3}{4}$ Welded	\$17.00
No. 23.	Center	.....	$\frac{3}{4}$ Welded	16.50
No. 24.	Center	.....	$\frac{5}{8}$ Welded	9.80
No. 25.	Center	.....	$\frac{1}{2}$ Welded	8.80
No. 26.	Center	.....	$\frac{1}{2}$ Welded	6.65
No. 27.	Center	.....	$\frac{1}{2}$ Welded	5.50
No. 28.	End	.....	$\frac{5}{8}$ Welded	9.50
No. 29.	End	.....	$\frac{1}{2}$ Welded	7.70
No. 30.	End	.....	$\frac{1}{2}$ Welded	6.40
No. 31.	End	.....	$\frac{1}{2}$ Welded	5.30
No. 32.	End	.....	$\frac{3}{8}$ Welded	4.75
No. 33.	End	.....	$\frac{3}{4}$ Welded	16.60

WELDED CLIPS, WITH RINGS



FIG. 4324

		Size of Round Part of Clip In.	Size of Iron in Ring In.	Price per Hundred	End With Ring
No. 34.	Center	$\frac{3}{4}$	$\frac{5}{8}$	\$23.10	
No. 35.	Center	$\frac{5}{8}$	$\frac{1}{2}$	15.30	
No. 36.	Center	$\frac{5}{8}$	$\frac{1}{2}$	14.50	
No. 37.	Center	$\frac{3}{4}$	$\frac{1}{2}$	12.90	
No. 38.	Center	$\frac{1}{2}$	$\frac{1}{2}$	12.70	
No. 39.	Center	$\frac{1}{2}$	$\frac{1}{2}$	11.50	
No. 39 $\frac{1}{2}$.	Center	$\frac{1}{2}$	$\frac{3}{8}$	8.50	
No. 40.	End	$\frac{1}{2}$	$\frac{1}{2}$	13.00	
No. 41.	End	$\frac{1}{2}$	$\frac{1}{2}$	10.30	
No. 42.	End	$\frac{1}{2}$	$\frac{3}{8}$	8.25	
No. 43.	End	$\frac{3}{8}$	$\frac{1}{2}$	7.00	



FIG. 4325

TWISTED CLIPS



FIG. 4326

	Size of Round Part	Price per Hundred
No. 50.	$\frac{3}{4}$ in.	\$19.00
No. 51.	$\frac{5}{8}$ in.	14.00
No. 52.	$\frac{1}{2}$ in.	13.00
No. 53.	$\frac{1}{2}$ in.	11.00

WAGON HARDWARE—CONTINUED FOR SINGLETREES AND DOUBLETREES, WELDED CLIPS WITH HOOKS

Center Hook



FIG. 4327

		Size of Round Part of Clip, In.	Size of Iron in Hook, In.	Price per Hundred
No. 44.	Center	$\frac{3}{8}$	$\frac{3}{8}$	\$29.50
No. 44½.	Center	$\frac{3}{8}$	$\frac{3}{8}$	28.00
No. 45.	Center	$\frac{5}{8}$	$\frac{1}{2}$	18.00
No. 45½.	Center	$\frac{5}{8}$	$\frac{1}{2}$	16.30
No. 45¾.	Center	$\frac{1}{2}$	$\frac{1}{2}$	13.20
No. 46.	End	$\frac{1}{2}$	$\frac{1}{16}$	11.35
No. 46A.	End	$\frac{5}{8}$	$\frac{1}{2}$	15.00
No. 47.	End	$\frac{5}{8}$	$\frac{3}{8}$	9.00
No. 48.	End	$\frac{3}{8}$	$\frac{5}{16}$	7.50
No. 49.	End	$\frac{11}{16}$	$\frac{3}{16}$	6.70
No. 49A.	End	$\frac{5}{8}$	$\frac{5}{16}$	6.60
No. 49B.	End	$\frac{5}{8}$	$\frac{1}{4}$	6.00



FIG. 4328

FERRULES AND HOOKS



FIG. 4329

	Diameter Inside Small End		Price per Hundred
No. 55.	1¾ in. Ferrule,	$\frac{7}{16}$ in. Hook	\$13.20
No. 55½.	1½ in. Ferrule,	$\frac{7}{16}$ in. Hook	12.20
No. 56.	1½ in. Ferrule,	$\frac{7}{16}$ in. Hook	10.70
No. 56½.	1½ in. Ferrule,	$\frac{3}{8}$ in. Hook	9.10
No. 57.	1¾ in. Ferrule,	$\frac{3}{8}$ in. Hook	8.10
No. 58.	1¾ in. Ferrule,	$\frac{3}{8}$ in. Hook	7.60
No. 58½.	1¼ in. Ferrule,	$\frac{7}{16}$ in. Hook	7.35
No. 59½.	1½ in. Ferrule,	$\frac{7}{16}$ in. Hook	7.10

HEAVY FERRULES WITH SHORT HOOK TO PULL FROM THE FERRULE



FIG. 4330

	Diameter Inside Small End		Price per Hundred
No. 60.	1¾ in. Ferrule,	$\frac{7}{16}$ in. Hook	\$15.40
No. 60½.	1½ in. Ferrule,	$\frac{3}{8}$ in. Hook	13.00
No. 60½.	1½ in. Ferrule,	$\frac{7}{16}$ in. Hook	14.25
No. 61.	1½ in. Ferrule,	$\frac{7}{16}$ in. Hook	12.50
No. 61½.	1½ in. Ferrule,	$\frac{3}{8}$ in. Hook	10.50
No. 62.	1¾ in. Ferrule,	$\frac{3}{8}$ in. Hook	9.50
No. 62½.	1¼ in. Ferrule,	$\frac{3}{8}$ in. Hook	9.00
No. 63.	1¼ in. Ferrule,	$\frac{7}{16}$ in. Hook	8.75

SINGLETREE HOOKS, SMALL EYE

	Price per Hundred		Price Per Hundred
No. 64.	$\frac{7}{16}$ in. \$4.60	No. 65.	$\frac{3}{8}$ in. \$3.70
		No. 66.	$\frac{7}{16}$ in. 2.70

SINGLETREE HOOKS, LARGE EYE

	Price per Hundred		Price Per Hundred
No. 64½.	$\frac{7}{16}$ in. \$5.00	No. 66½.	$\frac{7}{16}$ in. \$3.10
No. 65½.	$\frac{3}{8}$ in. 4.10		

HEAVY FERRULES WITH RING TO PULL FROM FERRULE

	Diameter Small End	Ring	Price Per Hundred		Diameter Small End	Ring	Price Per Hundred
No. 68	1¾ in.	$\frac{7}{16}$	\$14.40	No. 69½	1½ in.	$\frac{3}{8}$	\$9.60
No. 68½	1¾ in.	$\frac{3}{8}$	13.10	No. 70	1¾ in.	$\frac{3}{8}$	9.00
No. 69	1½ in.	$\frac{7}{16}$	11.25	No. 70½	1½ in.	$\frac{3}{8}$	8.30

WAGON HARDWARE—CONTINUED

SETS OF WELDED CLIPS

For Singletrees.

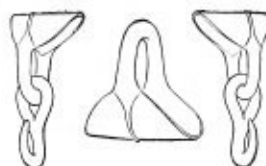


FIG. 4331

Price per
Dozen Sets

No. 72. One Center $\frac{3}{4}$ in. Clip welded, and two $\frac{1}{2}$ in. End Clips welded, with $\frac{1}{16}$ in. Hooks, to the set.	\$4.76
No. 73. One Center $\frac{5}{8}$ in. Clip welded, and two $\frac{1}{16}$ in. End Clips welded, with $\frac{3}{8}$ in. Hooks, to the set.	3.33
No. 74. One Center $\frac{1}{16}$ in. Clip welded, and two $\frac{1}{16}$ in. End Clips welded, with $\frac{3}{8}$ in. Hooks, to the set.	3.21
No. 74 $\frac{1}{2}$. One Center $\frac{1}{2}$ in. Clip welded, and two $\frac{1}{16}$ in. End Clips welded, with $\frac{3}{8}$ in. Hooks, to the set.	2.95
No. 74 $\frac{3}{4}$. One Center $\frac{1}{2}$ in. Clip welded, and two $\frac{1}{16}$ in. End Clips welded, with $\frac{1}{16}$ in. Hooks, to the set.	2.72
No. 75. One Center $\frac{1}{2}$ in. Clip welded, and two $\frac{3}{8}$ in. End Clips welded, with $\frac{1}{16}$ in. Hooks, to the set.	2.59
No. 75 $\frac{1}{2}$. One Center $\frac{1}{16}$ in. Clip welded, and two $\frac{1}{16}$ in. End Clips welded, with $\frac{1}{16}$ in. Hooks, to the set.	2.24
No. 75 $\frac{3}{4}$. One Center $\frac{1}{16}$ in. Clip welded, and two $\frac{1}{16}$ in. End Clips welded, with $\frac{1}{4}$ in. Hooks, to the set.	2.10

Each dozen sets is securely wired together with the End Clips paired.

SETS OF WELDED CLIPS

For Doubletrees.

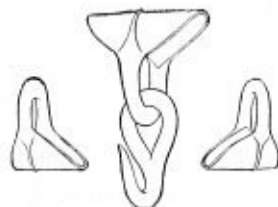


FIG. 4332

Price per
Dozen Sets

No. 76. One $\frac{3}{4}$ in. Center Clip welded, with $\frac{3}{4}$ in. Hook and two $\frac{1}{16}$ in. End Clips welded, to the set.	\$5.38
No. 76 $\frac{1}{2}$. One $\frac{3}{4}$ in. Center Clip welded with $\frac{5}{8}$ in. Hook and two $\frac{1}{16}$ in. End Clips welded, to the set.	5.20
No. 77. One $\frac{5}{8}$ in. Center Clip welded, with $\frac{1}{2}$ in. Hook and two $\frac{1}{2}$ in. End Clips welded, to the set.	3.69

WHIFFLETREE END IRONS

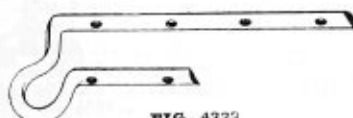


FIG. 4333

List..... $\frac{1}{2}$ in., per 100 \$7.35
 Section concave, round part $\frac{1}{2}$ inch
 Made to order as may be required.

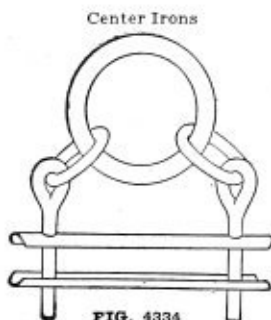


FIG. 4334

Diameter Inside
Small End

		END IRONS		Price per Hundred
No. 80.	Ferrule 1 3/4 in., Ring 3 1/4 x 1 3/8			\$12.30
No. 80 1/2.	Ferrule 1 5/8 in., Ring 3 1/4 x 1 3/8			11.30
No. 80 3/4.	Ferrule 1 1/2 in., Ring 3 x 3/8			10.80
No. 81.	Ferrule 1 1/2 in., Ring 3 1/4 x 1 3/8			9.60
No. 81 1/2.	Ferrule 1 1/2 in., Ring 3 x 3/8			8.20
No. 82.	Ferrule 1 3/8 in., Ring 3 x 3/8			7.70
No. 83.	Ferrule 1 1/4 in., Ring 3 x 3/8			7.10

WELDED RINGS

Diameter Inside of Ring	Size of Round	Price Per Hundred
2 in.	3/8 in.	\$3.52
2 in.	1/2 in.	3.94
2 in.	3/4 in.	4.74
2 1/4 in.	1/2 in.	5.86
2 1/4 in.	3/4 in.	6.94
3 in.	3/8 in.	4.32
3 in.	1/2 in.	5.26
3 1/4 in.	3/8 in.	7.32
3 1/2 in.	1/2 in.	7.71
3 3/4 in.	3/8 in.	9.58
4 in.	1/2 in.	8.37
4 in.	3/4 in.	10.00

SINGLE TREE STRAPS

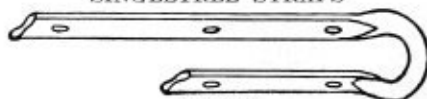


FIG. 4335

Round part 1/2 in. and 5/8 in. Total length 13 1/2 in. Section either concave or half oval.

Special sizes made to order, single or double pattern for ironing whiffletrees.

	Price per Hundred
1 1/8 in. Straight	\$6.10
1 1/8 in. Bent	6.65
1 1/2 in. Straight	6.60
1 1/2 in. Bent	7.15
1 3/8 in. Straight	7.90
1 3/8 in. Bent	8.45
1 7/8 in. Straight	9.10
1 7/8 in. Bent	9.65
Length from inside of bend to center of 1st hole	2 in.
Length from inside of bend to center of 2nd hole	5 3/4 in.
Length from inside of bend to center of 3rd hole	10 1/2 in.

WAGON HARDWARE—CONTINUED

NECK YOKE IRONS

Always Order by Trade Number.

Price per
Hundred

No. 78. Center Irons complete with welded
1 1/8 in. Eyes, 3/8 in Links, 3 1/4 x 1 3/8 Ring.....\$25.00

No. 79. Center Irons complete with welded
1/2 in. Eyes, 1/2 in. Links, 3 1/2 x 5/8 Ring..... 31.00

Also furnished with the eye bolts threaded and
with nuts.

LANSING TRUCKS

NO. 50 BAG TRUCK

With Stamped Steel Nose.



FIG. 4336

The ordinary Bag Truck of this style is made with nose of cast iron; as they must be light the noses are very easily broken, being often broken in shipping.

At considerable expense we have put in special machinery for stamping the noses of these trucks from a solid piece of steel, making the nose the strongest part of the truck. Our customers, we feel sure, will appreciate the fact that for this reason these trucks are superior to any other bag trucks made. They are so cheap that every farmer should have one, and by a little push on the part of the dealer a large number can be disposed of.

Turned bearings. Length, 42 inches; width at nose, 11¼ inches; diameter of wheels, 6 inches; weight each, 19 pounds; packed for export, measure 8 cubic feet per dozen.

With rubbered or fibre wheels.....Price each \$8.00
With iron wheels.....Price each 4.50



FIG. 4337

HEAVY BAG TRUCK

With Bent Plow Handles.

This truck is furnished with extra heavy cast nose and is designed for handling large sacks. Length of handles, 48 inches; width of truck at nose, 15 inches; width at upper cross-bar, 20 inches; 1-inch steel axle with turned bearings; iron wheel, 7½ inches diameter, 2-inch face. Weight, each, 60 pounds.

List price with iron wheels.....each \$ 9.00

List price with patent rubbered or fibre wheels..each 12.00



FIG. 4338

COMBINATION KEG TRUCK

This is a very useful truck for handling kegs—indeed it is surprising that even large barrels of sugar, etc., are easily handled on this truck. Kegs can be handled more rapidly on this truck than on any other.

Diameter of wheels, 5 inches, 1¼-inch tread; length of handle, 60 inches. Weight, 23 pounds.

Packed for export, 1 dozen, measure 5 cubic feet.

Priceeach \$4.50

LANSING TRUCKS

STEEL NOSE STORE AND WAREHOUSE TRUCKS—WESTERN PATTERN

Full Bound No. 31

Half Bound, No. 30



FIG. 4339



FIG. 4340

Nos. 0, 1 and 21 have three cross-bars, others four.

No.	Description	Weight Lbs.	Length of Handles, Inches	Diameter of Wheels, Inches	Width, Inches	One Dozen Packed for Export Meas- ure About	Price Each, with Rub- bered or Fibre Wheels	Price Each, with Iron Wheels
0W	Half Bound, No. 30	32	42	6	18	7 cu. ft.	\$12.50	\$6.00
1W	Half Bound, No. 30	43	48	7 1/2	19	12 cu. ft.	15.00	7.00
2W	Half Bound, No. 30	60	52	8 1/2	20	15 cu. ft.	18.50	9.00
3W	Half Bound, No. 30	84	56	9 1/2	22	17 cu. ft.	24.00	13.00
4W	Half Bound, No. 30	110	60	10 1/2	24	23 cu. ft.	32.00	16.00
21W	Full Bound, No. 31	50	48	7 1/2	19	13 cu. ft.	16.00	8.00
22W	Full Bound, No. 31	68	49	8 1/2	20	16 cu. ft.	19.00	10.50
23W	Full Bound, No. 31	87	56	9 1/2	22	18 cu. ft.	28.00	15.00
24W	Full Bound, No. 31	115	60	10 1/2	24	24 cu. ft.	34.50	18.50

*Only the highest grade rubbered wheels are used.

These trucks are firmly bolted together and have forged axles with turned bearings and steam bent handles.

STEEL NOSE RAILROAD AND STEAMBOAT TRUCKS—
WESTERN PATTERNAll our Trucks have Steel Noses, Forged Axles and
Turned Bearings. Extra Heavy, Full Bound.

FIG. 4341

No.	Description	Weight Lbs.	Length of Handles, In.	Diameter of Wheels, In.	Width, In.	1/2 doz. Packed for Ex- port Cu. ft. Measure	Price each with Rubbered or Fibre Wheels	Price each with Iron Wheels
34W	Two Straps in Center	120	60	10 1/2	24	14	\$36.00	\$20.00
35W	Two Straps in Center	150	66	12	25	15	44.00	28.00
4XX	Two Straps in Center, welded to nose,	144	60	10 1/2	24	14	44.00	28.00

*The ordinary cemented rubbered wheels would be of no use on these heavy trucks. We use the best made. These trucks are made extra heavy for depot and dock use, and will stand rough handling.

In comparing this list with others, take into consideration the weight of the trucks.

LANSING TRUCKS



FIG. 4342

BARREL TRUCKS

With Bent Iron Cross-Bars, Steel Nose, Full Bound

No.	Weights, Lbs.	Length of Handles, Inches	Diameter of Wheels, Inches	Width at Nose, In.	One Dozen Packed for Export Measure About	Price Each with Rubber or Felt-bored or Felt-bro Wheels	Price Each with Iron Wheels
71W	46	48	7½	19	13 cu. ft.	\$17.00	\$ 9.00
72W	70	52	8½	20	16 cu. ft.	20.00	11.00
73W	90	56	9½	22	18 cu. ft.	28.50	16.00



FIG. 4343

BARREL TRUCKS

New York Pattern

No.	Length of Handle, Inches	Width at Nose, In.	Width at Upper Bar, Inches	Wheel Diam. Face	Weight Lbs.	Price Each
81	48	13	16½	6 x 1¾	43	\$9.00
82	52	14½	19½	7½ x 2	52	10.50
83	55	15½	21	9½ x 2¾	77	12.50
84	62	15¾	22½	10½ x 3	82	15.00
85	63	17½	23¾	10½ x 3	116	17.00

These trucks have steel nose, side straps, cross bars and axle; handles of best selected hardwood, hickory, oak or ash; axles turned, wheels bored. Woods nicely oiled and varnished. Irons blacked.

ATLAS PRESSED STEEL TRUCK THE ONE NUT TRUCK

Styles No. 3-WS, 3½-WS,
3-WL, 3½-WL
No. 4



FIG. 4344

Styles No. 3½-ES, 3½-EL,
3-ES, 3-EL



FIG. 4345

These trucks are designed for great strength and durability, and to reduce to a minimum the need of bolts and rivets as a means of fastening. The whole body portion, including the axle supports, is made from one piece of sheet steel.

The wheels revolve on bearings of hardened steel on a stationary axle which is supported at four points instead of only two as is customary. By the tightening of a nut, the axle, ears, bearings, casing and washers are drawn together into a rigid, compact unit of construction to withstand the heavy use and abuse to which hand-trucks are subjected.

The wheels are placed wide apart to prevent tipping when load is unevenly divided, and they are so housed within the frame as to protect packages from damage by rubbing.

Truck No. 3 is designed for general freight and warehouse use, No. 3½, having depressed cross bars, is especially useful when cylindrical packages or barrels form a majority of the freight handled.

STYLES NOS. 3-WS, 3-WL, 3½-WS, 3½-WL AND NO. 4

No.	3-WS	3-WL	3½-WS	3½-WL	4
Length over all, inches.....	50	54	50	54	66
Width at Nose, inches.....	19	19	19	19	24
Width at Handles, inches.....	21	21½	21	21½	23
Length of Nose, inches.....	4⅞	4⅞	4⅞	4⅞	5½
Wheels, inches.....	9x2	9x2	9x2	9x2	12x2¼
Weight, pounds.....	65	65	65	65	120

STYLES NOS. 3½-ES, 3½-EL, 3-ES AND 3-EL

No.	3-ES	3-EL	3½-ES	3½-EL
Length over all, inches.....	50	54	50	54
Width at Nose, inches.....	19	19	19	19
Width at Handles, inches.....	21	21½	21	21½
Length of Nose, inches.....	4½	4½	4½	4½
Wheels, inches.....	9x2	9x2	9x2	9x2
Weight, pounds.....	65	65	65	65

ALL-STEEL STEEL NOSE TRUCKS

The Handles Only Are Wood, Western
Pattern

There is a demand for these All-Steel Trucks from railroads and others who have had trouble with the wooden trucks because of breakage of the wooden parts.

The sides are made of steel pressed into shape and ribbed to increase the strength without adding to the weight. The legs are made of angle steel pressed to the proper shape. Cross bars are of angle steel. The entire truck frame is securely riveted together.

Length of handles, 58 inches; weight, 135 pounds; width at nose, 24 inches; width at handle end, 24 inches; wheels, 10½ inches; diameter, 2¾ inch face.

Price, each, \$28.00.



FIG. 4346

Mc MASTER BARREL HOIST



FIG. 4347



FIG. 4348

Some reasons why you should use this Jack and Stand:

One man will elevate a 600 lb. barrel, doing the work of four men.

Eliminating all danger of the barrel slipping and injuring the persons elevating the barrel the old way.

You place the full barrel back in the space where the empty one came out of without moving any other barrels.

This stand makes your space occupied by the barrel accessible to clean, thereby making it sanitary.

The same stand will elevate a wood barrel just the same as a steel barrel.

The construction of the Hoisting Jack and Stand, being of malleable iron, is strong and durable, and can be used anywhere in or out of buildings just so there is a solid place to set it. When not in use it folds up flat.

Every person who uses barrels should use the Hoisting Jack and Stand and thereby save accidents, time and money.

List priceeach \$7.50

STUEBING LIFT TRUCKS



FIG. 4349

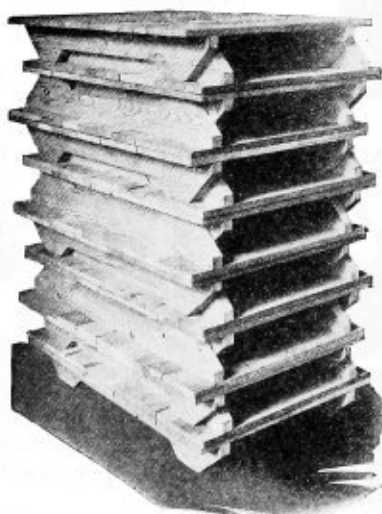


FIG. 4350

The Stuebing Lift Trucks are used in connection with Trays, like those shown in the above cut. Loads are piled on the trays, the Lift Trucks are run under the loaded trays, which are lifted from floor and transferred to any floor or department. Loads running up to 14,000 lbs. are easily handled. One man does all the work.

See following page for specifications.

STUEBING LIFT TRUCKS—CONTINUED

MODEL "S"—18 INCHES WIDE

First number indicates wheel diameter in inches. Last number indicates in inches body length from stop to rear.

Model.	*S 6-30	S 6-30	S 6-36	S 7-36	S 7-48	S 9-36
Carrying capacity, lbs.....	2,000	3,000	3,000	3,000	3,000	3,000
Life (amount of elevation), in.	1½	1½	1½	1½	1½	1½
Wheel diameter, inches.....	6	6	6	7	7	9
Extreme width, inches.....	18	18	18	18	18	18
Length, platform stop to rear, inches.....	30	30	36	36	48	36
Height of Truck, lowered, in.	6	6	6	7	7	9
Height of truck, elevated, in.	7½	7½	7½	8½	8½	10½
Extreme length, truck in raised position, handle up, inches.....	38½	38½	47	48	60	52
Wheel base, inches.....	32½	32½	41	41	53	42
Weight, net, lbs.....	215	230	246	261	312	274
Platform, maximum, inches..	40x33	40x33	48x33	48x33	62x33	48x33
Platform, minimum, inches..	25x22	25x22	30x25	30x25	42x25	30x25

*Light model has three wheels, two in rear each 2-inch face; one in front 3-inch face.

MODEL "L"—26½ INCHES WIDE

First number indicates wheel diameter in inches. Last number indicates in inches body length from stop to rear.

Model.	L 7-42	L 7-48	L 9-48	L 9-60	For Electric Truck Platforms *L 9-48 Special	
					5,000 to 10,000	
Carrying capacity, lbs.....	3,500	4,000	5,000	5,000	5,000 to 10,000	
Life (amount of elevation), in.	1½	1½	1½	1½		1½
Wheel diameter, inches.....	7	7	9	9		9
Extreme width, inches.....	26½	26½	26½	26½		26½
Length of Steel Platform Stop to rear, inches.....	42	48	48	60		48
Height of truck, lowered, in.	7	7	9	9		10, 11 or 12
Height of truck, elevated, in.	8½	8½	10½	10½		11½, 12½ or 13½
Extreme length, truck in raised position, exclusive of handle, inches.....	52½	58½	60	72		60
Wheel base (distance between axles), inches.....	43	49	49	61		49
Weight, net, lbs.....	313	318	338	358		372
Platform, maximum, inches..	54x42	62x44	62x44	74x44		62x44
Platform, minimum, inches..	36x35	42x35	42x35	54x35		42x35

Wheels, four; front 2 inches wide, rear 3 inches wide.

Hyatt Roller Bearings are used on all wheels.

Special trucks are built in all sizes and capacities for special or unusual conditions.

*Where electrically driven lift trucks are in use, Stuebing lift trucks can be supplied in the right size for use under the same platforms. With such an arrangement, the electric trucks can be used for long hauls and interdepartment work, while the Stuebing truck is more economical and quicker for short hauls. This is the standard of application by the largest plants.

MCKINNEY ONE-MAN TRUCKS

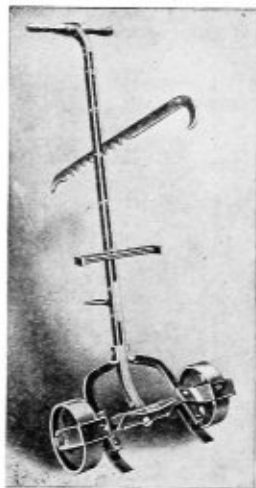


FIG. 4351

The McKinney Truck is a steel labor-saving device for handling wooden and steel barrels, boxes, kegs, crates, cases, lacquer drums and other packages ranging in weight from a few pounds up to 1,200 pounds.

With a McKinney Truck one man with no assistance whatever can do the work requiring from three to four men where the old-fashioned hand truck is used.

After placing the adjustable hook over the package to be moved, the operator simply pushes downward on the pedal or footplate and pulls downward on the handle to swing the load on to the truck. In handling steel barrels, a special clamp is used instead of the adjustable hook.

This clamp is made to fit down over the rim of the steel barrel.

SHOWING TRUCK IN OPERATION

These trucks are practically indestructible. All parts of the trucks except the wheels and handle are constructed of the most durable spring steel. The wheels are equipped with steel roller bearings and have a special guard or hood which prevents wide packages from slipping from the truck in transit.

Made in four sizes, and special trucks have been designed for handling large bulky rolls of paper, acid carboys, steel shop boxes, etc., which can be furnished upon receipt of order.

In ordering, give the maximum weight and size of loads handled, in the case of steel barrels, the thickness of the rim must be given together with the height of the barrels.



FIG. 4352

No. of Truck	Length of Shaft Inches	Width at Axle Inches	Length of Hook Inches	Diameter of Wheels Inches	Face of Wheels Inches	Weight Pounds	Capacity Pounds	Price Each
1	56	25	32½	8	2½	70	1000	....
2	48	20	32½	7	1¾	46	750	....
3	44	15¼	29	6	1½	30	350	....
1A	62	25	32½	8	2½	90	1200	....

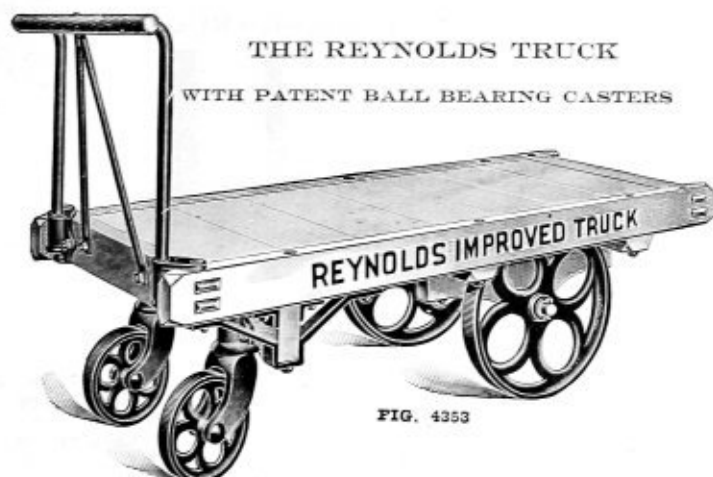


FIG. 4353

No.	Size of Platform in Feet*	Diameter of Wheels, Inches	Diameter of Casters, Inches	Height to Top of Platform, Inches	Capacity in Lbs.	Weight, Lbs.	Price Each
0	2 x 3	12	6	14	1,200	135	\$24.00
1	2 x 4	12	6	14	1,200	152	25.00
3	2½ x 4	12	6	14	1,200	172	26.10
4	2 x 5	12	6	14	1,200	161	26.10
5	3 x 4	12	6	14	1,200	173	27.00
6	2½ x 5	12	6	14	1,200	175	27.00
8	2 x 5	12	6	14	1,200	192	29.25
9	2 x 4	18	9	19	3,000	217	30.00
11	2½ x 4	18	9	19	3,000	229	31.50
13	2½ x 4½	18	9	19	3,000	237	32.25
15	3 x 4	18	9	19	3,000	246	33.00
16	2½ x 5	18	9	19	3,000	243	33.00
18	2 x 5	18	9	19	3,000	230	32.25
19	2 x 6	18	9	19	3,000	240	33.00
20	2½ x 6	18	9	19	3,000	255	34.50
21	3 x 5	18	9	19	3,000	255	35.25
22	3 x 6	18	9	19	3,000	270	36.00
23	3 x 8	18	9	19	3,000	310	40.00

For very heavy work

*The trucks are about 4 inches longer over all.

FACE OF WHEELS AND CASTERS

Trucks numbered 0 to 8 inclusive have casters with 1¼-inch tread, wheels 2-inch tread.

Trucks numbered 9 to 23 inclusive have casters with 1½-inch tread, wheels 2½-inch tread.

Trucks numbered 9 to 23 inclusive, with extra heavy casters, with 2½-inch tread, wheels 3½-inch tread, are \$3.00 extra per truck advance on above prices.

RUBBER TIRED WHEELS

Trucks numbered 0 to 8 inclusive, with grooved wheels and casters, with round rubber tires sprung into groove. Price \$8.00 extra per truck.

Trucks numbered 0 to 8 inclusive, with patent rubber tired wheels and casters. Price \$12.00 extra per truck.

Trucks numbered 9 to 23 inclusive, with patent rubber tired wheels and casters. Price \$24.00 extra per truck.

All trucks furnished with ball bearing casters. If roller bearing wheels are desired, add \$3.00 per truck to the list price.

REYNOLDS FREIGHT HOUSE TRUCK



FIG. 4354

Platform, 3x6 feet; height, 19 inches; weight, 370 pounds; capacity, 6,000 pounds; 18 inch roller bearing wheels; 9 inch patent ball bearing casters.
 Price Each \$40.00

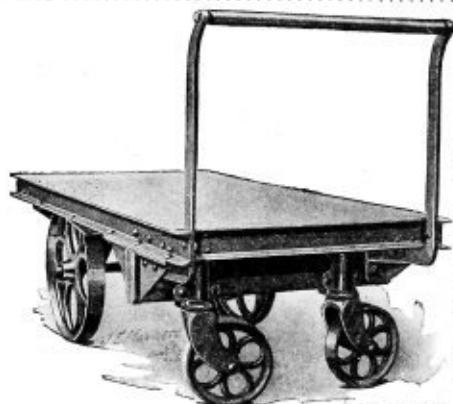


FIG. 4355

ALL-STEEL REYNOLDS TRUCKS

FACE OF WHEELS AND CASTERS

Trucks numbered 18 to 88, inclusive, have casters with $1\frac{1}{4}$ inch tread; wheels, 2 inch tread.

Trucks numbered 98 to 228, inclusive, have casters with $1\frac{1}{2}$ inch tread; wheels, $2\frac{1}{4}$ inch tread.

Trucks numbered 98 to 228, inclusive, with extra heavy casters with $2\frac{1}{2}$ inch tread, wheels $3\frac{1}{2}$ inch tread, are \$2.00 extra per Truck advance on above prices. If furnished with large wheels, roller bearing, add \$3.00 to list.

No.	Size of Platform, Feet*	Diameter of Wheels, Inches	Diameter of Casters, Inches	Height to Top of Platform, Inches	Capacity, Pounds	Price, Each
18	2 x 4	12	6	14	2,000	\$37.50
38	2 $\frac{1}{2}$ x 4	12	6	14	2,000	39.20
48	2 x 5	12	6	14	2,000	39.20
58	3 x 4	12	6	14	2,000	40.50
68	2 $\frac{1}{2}$ x 5	12	6	14	2,000	40.50
88	3 x 5	12	6	14	2,000	43.90
98	2 x 4	18	9	19	4,000	45.00
118	2 $\frac{1}{2}$ x 4	18	9	19	4,000	47.25
158	3 x 4	18	9	19	4,000	49.50
168	2 $\frac{1}{2}$ x 5	18	9	19	4,000	49.50
188	2 x 5	18	9	19	4,000	48.40
198	2 x 6	18	9	19	4,000	49.50
208	2 $\frac{1}{2}$ x 6	18	9	19	4,000	51.75
218	3 x 5	18	9	19	4,000	52.90
228	3 x 6	18	9	19	4,000	54.00

*The Trucks are about 4 inches longer over all.

LANSING WAGON TRUCKS



FIG. 4356

Heavy duty platform trucks for all kinds of service. Made of hardwood, nicely oiled and varnished. Steel axles, hounds, tongue and fifth wheels with coil spring to hold handle in upright position when not in use.

No.	Size of Platform	Diam. Rear Wheels	Diam. Forward Wheels	Weight, Lbs.	Capacity	Price
58	30x60	18	12	293	4,000	\$37.00
59	36x60	18	12	305	4,000	39.00

When these trucks are fitted with our extra heavy wide tread wheels they take an additional list price of \$4.00.

When fitted with roller bearings they take an additional list price of \$4.00.

EXTRA HEAVY LANSING WAGON TRUCK

Same as above except

Platform, 72 inches long by 36 inches wide by 19½ inches high, made of selected hardwood; heavy, substantial frame. All woodwork oiled and varnished.

Rear wheels extra heavy, wrought spoke; 18 inches in diameter, 3½ inch face. Forward wheels 12 inches in diameter, 3 inch face. All roller bearing.

Steel axle 1½ inch square.

Fourteen inch forged steel fifth wheel, steel hounds, tongue and handle with heavy steel coil spring to hold handle in upright position when not in use.

Capacity 4,000 to 6,000 pounds. Weight, 400 pounds.....price \$48.00

WHOLESALE GROCERS' TRUCKS

FIG. 4357

End racks are made of heavy double bars and strongly bolted to the platform. Center axle is supported by heavy bolster of wood and heavily braced.

Size of platform, 30x54 inches; diameter of center wheels, 14x2½ inches; diameter of end wheels, 3¼x2½ inches; weight, 340 pounds each.

Price.....each \$35.00

HEAVY FOUNDRY WAGON



FIG. 4358

These trucks are designed for heaviest work about foundries and machine shops, or where a very strong platform truck is required. Too heavy for ordinary work. The truck is furnished with fifth wheel large enough to avoid upsetting. It will be noticed by the above cut that the platform is made of three inch hardwood planks. The entire edge of platform is bound with iron, making a platform of great strength and durability. Axles, 2 inches square.

Size 11—30x40 inches, 10½ inch wheels, 4 inch face.

List price.....\$36.00

Size 12—36x60 inches, 10½ inch wheels, 4 inch face.

List price.....\$48.00

Any size made to order.

U. S. PLATFORM TRUCKS



FIG. 4359

No.	Size of Platform	Height to Top of Platform, Inches	Diameter of Wheels, Inches	Weight, Each, Lbs.	Price, Each, with Rubber or Fibre Wheels	Price, Each with Iron Wheels
80	2 ft. x 3 ft.	12	7½	80	\$21.00	\$13.00
82	2 ft. 4 in. x 3 ft. 4 in.	12	7½	111	22.00	14.00
83	2 ft. 6 in. x 3 ft. 6 in.	12	7½	114	23.00	15.00
84	3 ft. x 4 ft.	13	8½	150	27.00	17.00

RAILROAD AND EXPRESS WAGON

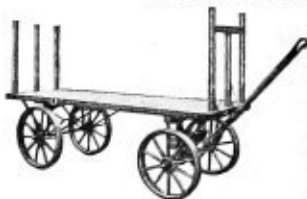


FIG. 4360

Size 1—These are the Standard Express Trucks, same as used by the American Express Co. They are heavily ironed and well made from steel and iron and selected hardwood. With 20-inch fifth wheel. Front wheels 28 inches in diameter. Rear wheels 31 inches in diameter. Platform 35 inches high, 40 inches wide and 10 feet long. Nicely painted and varnished. Furnished with American pattern wood wheels, steel wheels, or Sarven patent wheels as desired.

With American Pattern wood wheel, weight 650 lbs. Price..... each \$100.00

With steel wheels, weight 700 lbs. Price.....each 105.00

With Sarven wheels, weight 650 lbs. Price.....each 110.00

Size 2—This wagon is designed to meet the want of a smaller size than No. 1. Just the truck for small passenger stations. Well painted and varnished. With 20-inch wrought spoke wheels. Platform 2½x7 feet. All bearings turned. Weight about 450 pounds. Price.....each \$60.00



FIG. 4361

BOX TRUCKS

Low trucks, strong and well made, for handling large boxes or bales. Sharp cone head bolts to prevent package from slipping. Axles turned and wheels bored.

No.	Size	Size of Wheel	Size of Frame	Wght., Lbs.	Price, Each
1	16x18 in.	3½ in.	2½x4 in.	22	\$3.50
2	16x24 in.	4 in.	2½x4 in.	32	4.00
3	18x26 in.	4½ in.	3½x4 in.	38	4.50

Above can be furnished with rubbered wheels at an additional list price of \$3.50.

TRIANGULAR BOX TRUCKS

No. 123



FIG. 4362

No. 623



FIG. 4363

This truck is strongly made, and adapted for moving barrels, cases, tubs, etc., and runs extremely easy owing to the mounting, which consists of three anti-friction casters. This enables it to turn easily under a heavy load. Length of sides, 20 inches.

All Steel, No. 623.	Weight, 27 pounds.	Price.....each	\$11.00
Wood, No. 123.	Weight, 7 pounds.	Price.....each	2.50

TIMBER DOLLIES

No. 98



FIG. 4364

No. 646



FIG. 4365

For moving heavy timbers. A very useful article in sawmills, or wherever heavy sticks are handled. Made of oak or hickory, with roller of cast iron. Wrought axle passes entirely through roller. The truck forms a roller when bottom side up.

No.	No.	Frame	Roller	Weight Lbs.	Price Each
1	98	16 x 19 in.	6 x 10 in.	58	\$7.50
2	98	19½ x 26 in.	6 x 12 in.	70	10.00
3	98	18½ x 24 in.	8 x 12 in.	49	5.00
4	646	18 x 18 in.	*7 x 12½ in.	61	7.50

Numbers 1, 2 and 3 furnished with wood rollers at same price.

*Diameter at center, 3¼ inches.

THE "KNICKERBOCKER" HAND CART



FIG. 4366

A Full Steel Frame. Nicely Painted and Striped.

Wheels do not project above box. Load can be laid on top of as well as inside of box. Leg folds up to handle when desired. Wheels either wood or steel 30 inches in diameter. Depth of box, 10 inches.

No. 21.	Size of box inside, 26x40 inches.	Weight, 106 pounds.	Price
each			\$15.00

No. 22.	Size of box inside, 20x40 inches.	Weight, 95 pounds.	Price.
each			\$14.00



FIG. 4367

STREET CLEANER'S CART

For Use With Bag.

A simple device used in many cities for collecting refuse from the streets. The bags are filled and then left on street to be gathered up. The frame is very strong, being made of angle steel. Handles of gas pipe. Diameter of wheel, 30 inches. Weight, 65 pounds. List price \$14.00



FIG. 4368

STREET CLEANER'S SCRAPER

Made of pressed steel, No. 12 high carbon, 24 inches long, 5½ inches wide, with flange 1½ inches deep. Handles 52 inches long of 1½-inch material. Price.....each \$1.75

THE "CLIMAX" SCOOP-TRUCK



FIG. 4369

The CLIMAX SCOOP-TRUCK is designed to increase from six to ten-fold, the efficiency of a man in unloading coal, grain or similar bulk freight from the ends of box cars to wagon, bin or hopper and in moving such material wherever it can discharge its load at the floor level or from an inclined run-board rising two or three feet above the floor level.

Capacity 200 lbs. coal, $2\frac{1}{2}$ bushels grain.....price each \$18.00

SKIDS



FIG. 4370

Made of selected oak, rock elm, or hickory. Ends heavily ironed. Oiled and varnished.

No.	Length and Kind	Dimensions of Side Rails. Inches	No. of Cross- Bars	Weight in Pounds Each
1	6 feet Light	$1\frac{1}{4} \times 2\frac{3}{4}$	2	20
2	6 feet Heavy	$1\frac{3}{4} \times 3$	2	34
3	7 feet Light	$1\frac{1}{4} \times 2\frac{3}{4}$	2	24
4	7 feet Heavy	$1\frac{3}{4} \times 3\frac{1}{4}$	2	38
5	8 feet Light	$1\frac{1}{2} \times 2\frac{3}{4}$	3	30
6	8 feet Heavy	$1\frac{3}{4} \times 3\frac{1}{2}$	3	40
7	9 feet Heavy	$1\frac{3}{4} \times 3\frac{1}{2}$	3	45
8	10 feet Heavy	$1\frac{3}{4} \times 3\frac{3}{4}$	3	50
9	12 feet Heavy	$1\frac{3}{4} \times 4$	4	65

Any size under six feet, same price as six feet.

Light Skidsper foot \$0.80

Heavy Skidsper foot 1.00



FIG. 4371

POUNDED ASH BASKETS

These baskets are presented to the trade as the best that can be produced, taking light weight, strength, and durability into consideration. The stock is prepared in the only natural method, by pounding. Each year's growth being separated from its fellow retains all the native strength and vitality of the timber, which has never been subjected to the action of steam.

Weight Lbs.	Capacity, Bushels	Length, Inches	Width, Inches	Depth, Inches	Diameter of Wheel in Caster	Price, Each
17	2	24	17	13	2	\$3.60
24	4	30	19	17	2	5.20
29	6	33	22	21	2	8.20
37	8	34	24	24	2½	10.00
39	10	36	26	24	2½	12.00
44	12	36	26	28	2½	13.60
64	16	40	28	33	3½	16.00

These baskets can be furnished with 6 inch wheels at center and a caster at each end at a net additional price of 50 cents per basket.



FIG. 4372

FIBRE TRUCKS

This truck is securely bound throughout with best grade hardwood strips, making a very strong and at the same time a light truck.

Truck is mounted on 4½ inch wheels having broad faces to prevent cutting floors. The center wheels are raised slightly, so truck has a slight tilt and can be easily turned.

No.	Length, Inches	Width, Inches	Depth, Inches	Price, Each
20	48	30	30	\$20.00
21	48	24	30	18.50
22	48	24	27	18.00
23	42	30	30	18.00
24	42	24	30	17.50
25	42	24	27	17.00
26	36	24	27	16.00
27	36	24	24	15.00
28	30	24	24	14.00

These trucks can be furnished with fibre or rubbered wheels when desired. In this case add \$2.00 to the net price.

TRUCK WHEELS

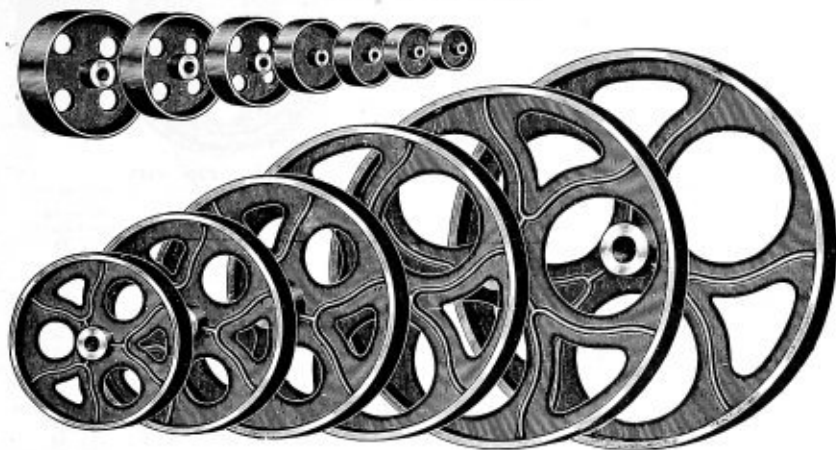


FIG. 4373

WIDE, FLAT FACE IRON WHEELS

Diameter inch	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4 $\frac{1}{4}$	5	6	8	10	12	14	16	18
Face inch	1	1 $\frac{1}{8}$	1 $\frac{3}{8}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2	2 $\frac{1}{4}$	2 $\frac{3}{4}$	2 $\frac{1}{4}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	2 $\frac{3}{4}$	2 $\frac{1}{2}$
Hub length inch	1 $\frac{1}{8}$	1 $\frac{3}{8}$	1 $\frac{3}{8}$	1 $\frac{3}{4}$	2 $\frac{1}{8}$	2 $\frac{3}{8}$	2 $\frac{3}{8}$	2 $\frac{3}{8}$	2 $\frac{3}{8}$	2 $\frac{3}{8}$	2 $\frac{3}{4}$	2 $\frac{3}{4}$	2 $\frac{3}{4}$
Hub diam. inch	1 $\frac{1}{8}$	1 $\frac{3}{8}$	1 $\frac{3}{8}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$
Hub bore inch	1 $\frac{1}{8}$	1 $\frac{3}{8}$	1 $\frac{3}{8}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$
Weight pounds	1 $\frac{1}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$
List each	\$0.15	0.20	0.25	0.35	0.45	0.60	0.75	1.00	1.25	1.50	1.85	2.25	4.00



FIG. 4374

WIDE WHEELS, SOFT RUBBER TIRES

Diameter outside	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4	4 $\frac{1}{4}$	5	5	6
Diameter inside	1 $\frac{1}{4}$	1 $\frac{3}{4}$	2 $\frac{1}{8}$	2 $\frac{3}{8}$	3	3 $\frac{1}{4}$	4	4	4 $\frac{1}{8}$
Face of rubber	3 $\frac{1}{4}$	3 $\frac{1}{4}$	1	1 $\frac{1}{8}$	1 $\frac{1}{8}$	1 $\frac{1}{8}$	1 $\frac{1}{8}$	1 $\frac{1}{8}$	1 $\frac{1}{8}$
Hub length	1 $\frac{1}{8}$	1 $\frac{3}{8}$	1 $\frac{3}{8}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$
Hub diameter	1 $\frac{1}{8}$	1 $\frac{3}{8}$	1 $\frac{3}{8}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$
Hub bore	1 $\frac{1}{8}$	1 $\frac{3}{8}$	1 $\frac{3}{8}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$
Weight pounds	1 $\frac{1}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$
List complete	\$0.40	0.60	0.90	1.20	1.40	2.00	1.80	3.00	5.00
List tire only	\$0.20	0.30	0.45	0.60	0.70	1.00	0.90	1.50	2.50

Packed in Bulk

TRUCK WHEELS

RUBBER TIRED WHEELS

When ordering rubber tired wheels or rubber tires, measure diameter from outside to outside of rubber tire.

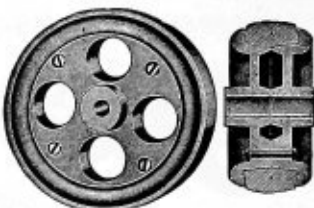


FIG. 4375

Diameter of Wheels Inches	Rubber Face, Inches	Through Hub, Inches	Bore of Wheels in Stock, Inches	Tires Only Per Dozen	Wheels Per Dozen
2 1/2	3/4	1 1/2	1/4	\$2.04	\$5.50
3	3/4	1 1/2	3/8	3.00	8.00
4	1	2	1/2	4.80	11.50
5	1	2 1/4	1/2	6.60	16.00
6	1 1/8	2 1/2	5/8 and 3/4	8.40	23.30
7	1 1/4	2 3/4	5/8 and 3/4	10.20	29.30
8	1 1/2	3	5/8 and 3/4	12.00	35.00
9	1 3/4	3	5/8 and 3/4	18.00	51.00
10	1 3/4	3	5/8 and 3/4	20.40	64.00
12	1 3/4	3	5/8 and 3/4	25.20	74.40
14	1 3/4	3	5/8 and 3/4	32.64	99.00
15	1 3/4	3 1/2	5/8 and 3/4	37.20	106.00
16	1 3/4	3 1/2	5/8 and 3/4	42.00	112.00
20	1 3/4	3 1/2	5/8 and 3/4	54.00	145.00
25	2 1/4	3 1/2	5/8 and 3/4	81.60	220.00

No. 759

No. 762

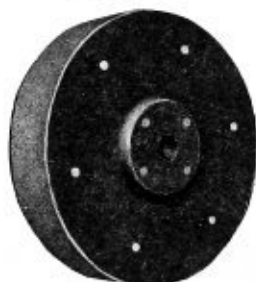


FIG. 4376



FIG. 4377

SOLID FIBRE WHEELS—NO. 759

Face, Inches	3/4	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3
3 Inch Diameter	\$0.40	\$0.44	\$0.48	\$0.52	\$0.56	\$0.66	\$0.72	\$0.82	\$0.88	\$1.00
4 Inch Diameter	.44	.50	.56	.62	.68	.82	.88	1.02	1.08	1.22
5 Inch Diameter	.60	.68	.76	.84	.92	1.08	1.16	1.32	1.40	1.56
6 Inch Diameter	.70	.78	.86	.94	1.04	1.20	1.28	1.44	1.52	1.68
7 Inch Diameter	1.14	1.32	1.50	1.68	1.86	2.04	2.22	2.44	2.62	2.84
8 Inch Diameter	1.35	1.60	1.84	2.08	2.32	2.56	2.80	3.10	3.34	3.64
9 Inch Diameter	1.46	1.74	2.02	2.30	2.58	2.86	3.14	3.50	3.86	4.30
10 Inch Diameter	1.64	1.96	2.28	2.60	2.92	3.24	3.56	3.96	4.28	4.68
11 Inch Diameter	1.78	2.16	2.54	2.92	3.30	3.68	4.06	4.54	5.02	5.58
12 Inch Diameter	1.90	2.68	3.08	3.48	3.88	4.30	4.72	5.14	5.56	5.98
13 Inch Diameter	2.44	2.90	3.36	3.82	4.28	4.74	5.22	5.70	6.18	6.66
14 Inch Diameter	2.60	3.10	3.60	4.10	4.60	5.10	5.62	6.14	6.66	7.18
15 Inch Diameter	3.12	3.80	4.48	5.16	5.84	6.52	7.20	7.90	8.60	9.30
16 Inch Diameter	3.36	4.14	4.92	5.70	6.48	7.26	8.04	8.84	9.64	10.44

FIBRE WHEELS WITH METAL CENTERS—NO. 762

Face, Inches	1 1/4	2	2 1/4	2 1/2	2 3/4	3
12 Inch Diameter	\$3.50	\$3.74	\$4.15	\$4.50	\$5.00	\$5.52
14 Inch Diameter	4.40	5.00	5.52	6.14	5.50	7.00
16 Inch Diameter	5.62	6.40	7.20	7.95	8.76	9.58
18 Inch Diameter	.....	.....	8.00	8.50	9.00	9.76

Note—When ordering wheels always state the length of hub and bore desired.

CONTRACTOR'S DUMP CART



FIG. 4378

Bodies made of selected white oak, extra well ironed and braced.

Wheels are extra strong and well made. Rims are made of tough straight grained white oak, thoroughly seasoned and bent to a true circle. Hubs are of finest quality black birch, thoroughly air seasoned. Spokes are made of extra select white oak.

End board lifts out and by releasing the box at front end it dumps automatically, being fastened to the axle with heavy hinges.

Nicely finished in dark red and green. This is the best all around dump cart on the market.

Size of Steel Axle	Size Regular Tire	Height Regular Wheels	Size of Body	Weight Complete, Lbs.	Price
1½x8 in.	3x1½	5 feet	3 ft. wide, 5 ft. long, 1 ft. deep	660	\$64.00

Add extra to list for 6 inch top box, \$1.50.

PICK-UP CART



FIG. 4379

Adapted for contractor's work in handling timber, rails, and structural beams.

No.	Wheels	Axle	Length of Tongue	Tread	Price, Each
1	54 in. x 3 in.	2¼ in. sq.	10 ft.	54 in.	\$100.00
2	48 in. x 1½ in.	2 in. sq.	10 ft.	54 in.	90.00
3	40 in. x 1½ in.	2 in. sq.	10 ft.	54 in.	88.00

LANSING LUMBER CART

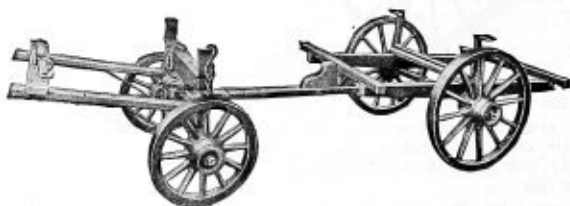


FIG. 4380

This cart is one of the most popular styles of lumber buggies on the market. It is the style adopted by many of the large lumber yards, saw mills and wood working plants, especially in the south. Only the very highest grade of materials are used in its construction.

The standard wood hub, thoroughly air seasoned, has no equal. Spokes are made of selected hardwood. A $3\frac{1}{4}$ in. x $\frac{3}{8}$ in. round edged steel tire is used on all wheels.

The bolster is bound with $\frac{3}{4}$ inch flat steel, which is turned up at both ends to form side stakes. These stakes are bent outward at the top, making a guard over wheels; these also form the necessary rest for unloading.

	Frame	Wheels	Tires	Axle	Wgt.	Price, Each
Rear Truck	3 ft. 2 in. x 6 ft. inside	36 in.	$3\frac{1}{4}$ in. x $\frac{3}{8}$ in.	$1\frac{3}{4}$ Sq. Steel	330	\$42.00
Forward Truck	3 ft. 4 in. wide inside	24 in.	$3\frac{1}{4}$ in. x $\frac{3}{8}$ in.	$1\frac{1}{2}$ Sq. Steel	340	54.00

FAIRBANKS GARDEN OR FARM WHEELBARROWS



FIG. 4382

Folding wood frame. Steel wheel.

These barrows have double frame of hardwood and removable side boards. Each barrow complete in one package, requiring a minimum of space in shipping and storing.

Barrows are well painted and varnished.

Can be furnished with a 3-inch tread wheel at extra price.

These barrows are adaptable to garden or farm use.

No.	Length Over All, Inches	Size of Bed, Inches			Depth of Box Inches	Capacity Cubic Feet	Wheel No.	Approx. Weight Pounds	List Price Each
		Length	Width at Wheel	Width at Handles					
83	57	21½	15½	17½	10	2	2	26	\$5.90
81	63	25	18	20	11	3	6	50	9.15
84	69	25	20	22	12	4	6	55	9.60
82	74	28	21	24	14	6	16	66	11.55

LANSING STABLE BARROW

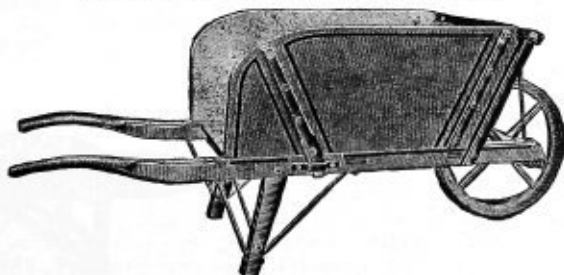


FIG. 4383

Length of box, 35½ inches; width, 25 inches; depth, 18½ inches; length over all, 89 inches. Fitted with a 24-inch wood wheel, having 1¾ inch face; axle, 18 inches between shoulders. Weight, each, 105 pounds. Price.....per dozen \$108.00

LANSING BARROWS

CLIMAX BOLTED BARROW



FIG. 4384

The Climax Barrow has a full size tray, with edges shaved, bolted to legs, and well bolted and braced in front. Legs galled and bolted to handles. Handles and legs of selected hardwood. Wheels painted.

With improved 16-inch sectional felloe wheel, weight per dozen, 540 pounds.

Price per dozen \$30.00

With steel wheel, weight, per dozen, 575 pounds.

Price..... per dozen \$33.00

SOUTHERN BARROW

Cleated tray, planed both sides. Leg brace extends beyond the handles and forms brace for the tray.

With Lansing 16 inch wood wheel. Weight, per dozen, 525 pounds. Packed for export measure about 30 cubic feet.

Price per dozen \$32.00

With steel wheel. Weight, per dozen, 525 pounds.

Price per dozen \$35.00

Can be equipped with 2½ inch tread wheels at \$2.00 per dozen net extra.



FIG. 4385

MICHIGAN JR. BARROW



FIG. 4386

This barrow is lighter than the New Michigan and material not so well selected.

With steel wheel, weight, per dozen, 565 lbs. Price per dozen.....\$28.00

Can be equipped with 2½-inch tread wheels, \$2.00 per dozen extra.

"PITTSBURGH RED" DIRT BARROW

Made of hardwood and given one coat of mineral red paint. Fitted with 16 inch steel wheel. Length, 61 inches over all; height, 21 inches; tray, 26 inches long; 22 inches wide, 6 inches deep. Weight, each, 38 pounds. Price.....per dozen \$51.00



FIG. 4387

LANSING BARROWS

BENT HANDLE STONE BARROW

With Steel Bottom.



FIG. 4388

Tray made of one piece of steel ($\frac{1}{4}$ inch thick), 26 inches wide, 27 inches long, 9 inches high in front. Weight, 125 lbs. each.

In other respects this barrow is the same as stone barrow shown below.

Price.....per dozen \$90.00

BENT HANDLE STONE BARROW

Made for heavy work. Bottom and front of $1\frac{1}{2}$ -inch hardwood, dressed and well seasoned. Barrows painted brown. Weight, 70 lbs. each.

Size of bottom, 28 inches wide, 27 inches long and 11 inches high in front. Handles 2x3 inches, dressed, made of oak, rock elm or hickory.

With Lansing iron hub wheel, extra heavy, per dozen\$60.00

With heavy steel wheel, per dozen..... 63.00



FIG. 4389

"PITTSBURGH" OPEN HEARTH BARROW



FIG. 4390

The heaviest and strongest barrow made. Ironed with half-inch iron. Cast iron shoes bolted on legs. The only wooden barrow that will stand carrying pig iron or billets. It will be noticed by referring to dimensions below that the barrow, though so heavy, is very compact, so the load is easily managed. Furnished with 40-pound cast iron wheel.

Handles 54 inches long. Length of iron work on top, 34 inches. Weight, 160 lbs.

Priceeach \$14.00

LANSING BRICK YARD BARROW

A barrow extremely popular with brick manufacturers. Made of selected lumber, 66 inches over all in length; height $30\frac{1}{2}$ inches over all; width, 23 inches; $15\frac{1}{2}$ inches from ground to top of bed. Fitted with either 18-inch wood wheel or 16-inch steel wheel. Weight, 86 pounds.

With heavy wood wheel, $1\frac{3}{4}$ -inch treadper dozen \$ 96.00

With iron wheel.....per dozen 104.00



FIG. 4391

LANSING BARROWS PIG METAL OR CASTING BARROW



FIG. 4392

A very strong, well-made barrow. Bottom and front of 1½-inch hardwood, dressed and well strapped with No. 10 steel. Painted brown. Weight, 69 pounds each. With Lansing iron hub wheel.

Price ..per doz. \$52.00
With heavy steel wheel.

Price ..per doz. 55.00

LANSING HAND-MADE SCRAP IRON BARROW

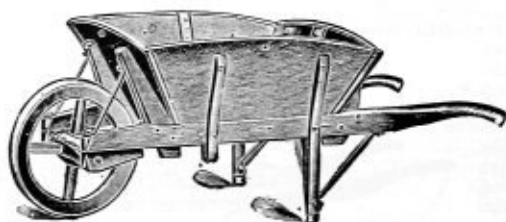


Fig. 4393

FIG. 4393

This barrow is made for very heavy work in and about foundries, rolling mills, machine shops, etc., and is made of the very best seasoned timber. Handles are of 2x3-inch white oak; box is made of 1½-inch maple. Size of box at top, 26 inches wide at wheel end, 30 inches wide at handle end, 34 inches long. Has a heavy wheel 19 inches

in diameter, 2-inch tread, and has ¼-inch tire. We put heavy iron bands on ends of the hub. Weight of barrow is 130 pounds. Has iron bands on ends of legs and all iron braces are of ¾-inch round iron. All irons are bolted.

Priceeach \$10.00

MORTAR BARROW

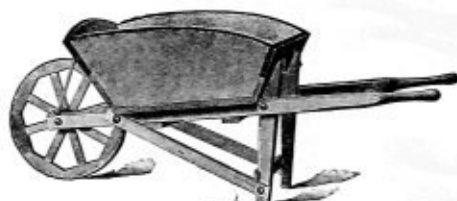


Fig. 4394

FIG. 4394

Tight box for wheeling mortar. Top, iron banded. Iron braced and well bolted. Size of box at top, 29 inches wide at wheel, and 26 inches wide at handles, 32 inches long. Size of box at bottom, 19 inches wide, 20 inches long. Box 14 inches deep at wheel, 8 inches deep at handles. Weight per dozen, 720 pounds.

With Lansing 18-inch iron hub wheel. Price.....per dozen \$48.00

With heavy iron wheel. Price.....per dozen 51.00



FIG. 4395

EXTRA HEAVY STAVE BOLT BARROW

Made of selected hickory, rock elm or white oak. Well ironed, braced and bolted. Oiled and varnished. Weight, each, 106 lbs. Average width, 27 inches.

With heavy 20-inch iron wheel, or heavy wood wheel, price..per doz. \$120.00

LANSING BARROWS

COLON BARROW

A Special Favorite with Contractors.

Tray of No. 16 Steel Without Seam or Rivet, Pressed Into Shape.

The edge of the tray is rolled over $\frac{1}{8}$ -inch steel rod, giving it a smooth finish, strength and durability. It is fitted with a heavy steel wheel 16 inches in diameter, or with heavy iron hub wheel (if specified) at the same price. Size of tray on top, 33x33 inches. Packed for export one dozen measures about 24 cubic feet. Weight, each, 50 pounds.

List price.....per dozen \$60.00



FIG. 4396

B1 AND B2 LANSING BARROWS

With Wire Edge Steel Tray



FIG. 4397

No.	One Dozen Packed for Export Measure	Diameter of Wheel Inches	Gage of Steel in Tray	Size at Top	Weight, Each Pounds	Price per Dozen
B-1	23 cu. ft.	16	16	33 in. long, 33 in. wide	55	\$60.00
B-2	23 cu. ft.	16	14	33 in. long, 33 in. wide	60	66.00

Wedge is placed under tray similar to that on Colon shown above.

F-1 LANSING STEEL TRAY BARROW



FIG. 4398

With angle steel legs and braces. A general purpose barrow, in great demand for brick, stone, sand, gravel, or any dry or semi-wet substance. Tray measures 33x33 inches, and is made of No. 16 steel, pressed from a single sheet without seam or rivet. The edge is rolled over a $\frac{1}{8}$ -inch steel rod, which adds much to its strength and prevents breaking. Heavy steel wheel 16 inches in diameter, $1\frac{3}{4}$ x $\frac{1}{2}$ -inch tire, running on a steel axle firmly held to under side of handles by heavy lugs. Capacity, 4 cubic feet. Weight, per dozen, 780 pounds.

Price.....per dozen \$66.00

LANSING BARROWS

C3 AND C4 LANSING BARROWS

With Wired Edge Steel Tray



FIG. 4339

These barrows are furnished with heavy steel wheels 16 inches in diameter. The trays are pressed from one piece of sheet steel without seam or rivet. Edges are flanged and turned over a $\frac{1}{4}$ -inch steel rod. All parts of the barrows are given a heavy coat of paint.

No.	One Dozen Packed for Export Measures	Diameter of Wheel, Inches	Gage of Steel in Tray	Size of Top, Inches	Capacity in Cubic Feet	Weight Each, Pounds	Price Per Dozen
C3	21 cu. ft.	16	16	32x29	3	55	\$66.00
C4	22 cu. ft.	16	14	32x29	3	65	72.00

C5 AND C6 LANSING BARROWS

With Wired Edge Steel Tray



FIG. 4400

To supply the demand for a wood frame barrow with large steel tray. The trays are made of one piece of sheet steel pressed into shape, with a $\frac{1}{8}$ -inch steel rod rolled into the edge. Barrows are fitted with steel wheels 16 in. in diameter. All parts of the barrow are given a heavy coat of paint.

No.	One Dozen Packed for Export Measures	Diam. of Wheel, Inches	Gage of Steel in Tray	Size at Top, Inches	Depth Front	Depth Back	Capacity in Cubic Feet	Wt. Lbs.	Price Per Dozen
C5	30 cu. ft.	16	14	29x36	8½	6	4½	58	\$ 78.00
C6	34 cu. ft.	16	16	33x42	11½	8	6	62	108.00

F-3 WOLVERINE BARROW

With Angle Steel Legs and Braces



FIG. 4401

inch spokes, and runs on a $\frac{5}{8}$ -inch steel axle, held to handles by heavy lugs. Weight, per dozen, 825 pounds. Do not confound these barrows with barrows having a rolled edge, but without a steel rod rolled in it.

Priceper dozen \$90.00

LANSING BARROWS

F 3½ LANSING BARROW

Same as F3 Wolverine in every particular, except handles do not extend beyond the wheel.

Price...per dozen \$87.00

Do not overlook the fact that the above barrows have a steel rod rolled in the tray. Also notice the steel shoes.



FIG. 4402

F-2 LANSING MORTAR BARROW



FIG. 4403

Angle steel legs and braces. Size of tray and capacity, same as H20, page 1553. An excellent barrow for mortar and wet concrete. Tray measures 26x34 inches and is made of No. 16 steel reinforced at corners and strengthened at top by being rolled over by a ½-inch steel rod. Heavy steel wheel 16 inches in diameter, 1¾x½-inch tire, running on a ⅝-inch

steel axle firmly held in heavy lugs. Capacity, 3½ cubic feet. Weight, per dozen, 875 pounds.

List per dozen \$92.00

We can furnish the above barrows, with angle risers and yokes in front of wheel when desired at extra price.

\$3.00 per dozen extra net for risers.

\$3.00 per dozen extra net for yoke.

F-4 LANSING MORTAR BARROWS

Just the thing for contractors, cement and concrete workers. It carries a man's load. Tray made of No. 15 steel, measures on top, 28x36 inches, on bottom, 20x21 inches. Depth at wheel, 18½ inches, at handle end, 9 inches; has heavy rod rolled in edge. Handles are heavy, of selected hardwood. Legs and braces of angle steel. Heavy steel wheel, 16 inches in diameter, running on a ⅝-inch steel axle through lugs bolted on under side of handle. Weight, per dozen, 900 pounds. List.....per dozen \$96.00



FIG. 4402

LANSING BARROWS

TUBULAR STEEL BARROWS



FIG. 4405

The trays of Lansing Tubular barrows are pressed from one piece of steel without seams or rivets. The edges of the trays are flanged and turned over a $\frac{1}{8}$ -inch steel rod. This rod prevents the tray from breaking at the edge and makes it very much stronger.

These barrows are made to dump forward, and are so constructed that at the dumping point they will not run back on the operator. They are well bolted and braced, and made of the best material, and painted.

The wheel revolves on a heavy bolt, which also passes through the handles and so materially strengthens the barrow.

Recommendations for the uses of Lansing Tubular Barrows are as follows:

A-2, A-02, A-1

These barrows are made with light gage trays and are designed for wheeling dirt and other light work.

A-13, A-14

These barrows are so constructed as to give good service in wheeling ore, castings and for general machine shop work.

A-15

The A-15 Barrow having a large tray is more especially designed for wheeling coal, having a capacity of about 270 lbs.

A-16, A-17

These barrows are designed especially for use in foundries, machine shops and other places where a large, heavy, very strong barrow is wanted.

No.	Size of Tray on Top, Inches	Gage of Steel in Tray	Capacity in Cu. Ft.	Diam. of Wheel, Inches	Weight, Lbs.	Price, Each
A-2	29x32	15	3	17	70	\$12.00
A-02	29x32	16	3	17	60	11.00
A-1	33x33	14	4	17	80	15.00
A-13	29x32	13	3	17	75	13.00
A-14	29x32	12	3	17	90	15.00
A-15	29x36	14	4½	17	86	15.00
A-16	29x36	12	4½	17	95	18.00
A-17	29x36	10	4½	17	110	20.00

LANSING BARROWS

TUBULAR STEEL COAL AND COKE BARROWS



FIG. 4406

These barrows, A18 and A18½, have very large trays pressed from a single sheet without seams, capacity about 275 pounds coke or 430 pounds coal. They are strongly made and well braced and thoroughly painted. Wheels revolve on a heavy bolt, which also passes through the handles and so materially strengthens the barrow. The edges of the trays are flanged and turned over a ½-inch steel rod. This rod prevents the tray from breaking at the edge and makes it very much stronger.

A18 IS DESIGNED FOR COAL

A18 1-2 AND A19 ARE DESIGNED FOR COKE

No.	Size at Top, Inches	Diameter of Wheel, Inches	Gage of Steel in Tray	Capacity	Weight Each, Pounds	Price
A18	33x42	17	14	430 lbs. coal, 6 cu. ft.	100	\$20.00
A18½	33x42	17	16	275 lbs. coke, 6 cu. ft.	90	19.00
A19	40x49	17	16	400 lbs. coke, 8 cu. ft.	100	24.00

H-20 LANSING TUBULAR BARROW

For Mortar and Wet Concrete



FIG. 4407

Dimensions in brief are as follows: Length over all, 64 inches; width over all, 26 inches; height over all, 29 inches; tray length, 35 inches; tray width, 25 inches; tray depth at wheel end, 17 inches; tray depth at handles, 7½ inches; gage of steel, No. 16; wheel diameter, 16 inches; tire, 1¼x¾ inches; steel axle, ½ inch; capacity in cubic feet, 4; weight in pounds, 82.

Priceeach \$18.00

Do not overlook the fact that the above barrows have a steel rod rolled in the tray.

JACKSON BARROWS

Type "A" Mining



FIG. 4408

Type "B" Coal



FIG. 4409

TYPE "A" MINING BARROW

Number	Capacity, Cubic Feet	Gage of Tray	Approximate Weight with No. 2 Wheel	Approximate Weight with No. 12 Wheel	Price Each
A1	3	15	72	60	\$.....
A2	3	14	77	65	.....
A3	3	13	81	69	.....
A4	3	12	86	74	.....
A4½	3	10	90	78	.....
A5	4	12	87	75	.....

TYPE "B" COAL BARROW

Type	Capacity Cu. Ft.	Pounds of Coal	Gage of Tray	Approximate Weight with No. 2 Wheel	Approximate Weight with No. 12 Wheel	Price, Each
B1	4	200	14	80	68	\$.....
B2	5	250	14	84	72	.....
B3	6½	325	14	93	81	.....
B3½	6½	325	12	105	93	.....
B4	8	400	11	112	100	.....
B5	8	400	15	90	78	.....

TYPE "F" FOUNDRY AND MILL BARROW



FIG. 4410

The trays are pressed from various gages of steel to meet the demands of bolt manufacturers, foundries, machine shops and mills where the work is of a severe nature.

Type	Capacity Cu. Ft.	Gage of Tray	Approximate Weight with No. 2 Wheel	Approximate Weight with No. 13 Wheel	Price, Each
F1	3	13	89	78	\$.....
F2	3	12	92	81	.....
F3	4	12	96	85	.....

ANGLE STEEL COKE BARROW

CAPACITY ABOUT 6 BUSHELS OF COKE



FIG. 4411

The only automatic Coke Barrow. By pressing a small lever with the foot the side of the barrow opens to discharge the contents. When the barrow resumes its normal position the side is securely locked.

The shafts are $1\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{16}$ inch angles, the legs are $1 \times 1 \times \frac{1}{4}$ inch angles and are securely braced from the front by $1 \times 1 \times \frac{1}{4}$ inch angles, cross braces between the side angles are $1 \times \frac{3}{16}$ inch Flat Bar Iron. The outside frame of the sides is $1 \times 1 \times \frac{1}{8}$ inch angle and the inner bars are $\frac{3}{4} \times \frac{3}{4} \times \frac{1}{8}$ inch angle and are held in place by lugs which project at either end and extend through the end sheets. The end and bottom sheets are No. 12 Gage Steel and is made in three pieces, thereby enabling the renewal of anyone part that may become worn. The wheel has a cast-iron hub, $\frac{3}{4}$ inch wrought iron spokes, $2 \times \frac{3}{8}$ inch wrought iron rim and tubular axle with solid journals which run in cast-iron journal boxes.

Approximate weight complete 150 lbs.

List price.....each, \$20.00

CONNELLSVILLE STANDARD COKE BARROW

This is the pioneer coke barrow and is used by the largest coal and coke operators in the United States. They are built of hard wood throughout, which makes them a very durable barrow.

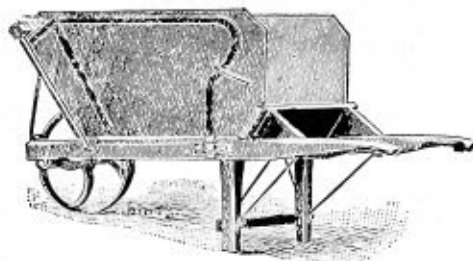


FIG. 4412

They are lined with sheet steel. Cast-iron wheel with wrought tire 2 inch tread. $1\frac{1}{4}$ inch square wrought axle. Wheel fastened to the axle with two set screws making a strong and durable wheel. The wheel and axle being the right weight to balance the barrow properly. Weight of barrow 150 pounds. Capacity 7 bushels of coke.

List price.....each, \$20.00

LANSING BARROWS

H-21 LANSING TUBULAR BARROW

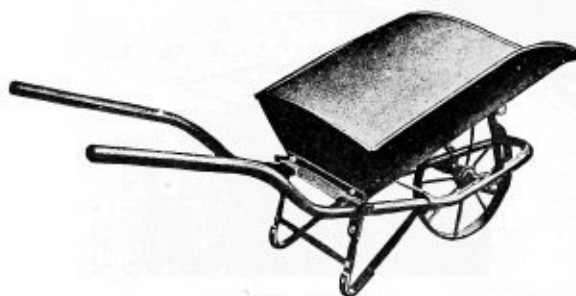


FIG. 4413

For handling brick, crushed stone, sand, gravel, mortar, or cement in charging concrete mixers. Hangs just right for handling easily. Load is dumped over wheel. Length over all, 65½ inches; width over all, 23½ inches; height over all, 27 inches; tray length, 38½ inches; tray width, 23 inches; tray depth, 13 inches; height at nose, 23½ inches; gage of steel, No. 16; wheel diameter, 16 inches; tire, 1¾ x ½ inches; steel axle, ⅝ inch; capacity in cubic feet, 4. Weight, 80 pounds. Priceeach \$18.00

H-22 LANSING TUBULAR BARROW



FIG. 4414

Especially adapted for cement and concrete. It carries a large load easily and without strain on the arms, because the bulk of the load is below wheel bearings and handles. On many kinds of work this barrow will be found a time and money saver. Length over all, 64½ inches; width over all, 25 inches; height over all, 28 inches; tray length, 38½ inches; tray width, 25 inches; tray depth, 15½ inches;

height at nose, 26 inches; gage of steel, No. 16; wheel diameter, 16 inches; tire, 1¾ x ½ inches; steel axle, ⅝ inch; capacity in cubic feet, 5. Weight, 85 pounds. Priceeach \$20.00

H-22½ LANSING TUBULAR

Same as H22, except with tray large enough to hold 220 pounds coke or 400 pounds coal. Priceeach \$28.00

We fit shoes to above barrows for extra heavy work. Do not overlook the fact that steel rod is rolled in the trays.

LANSING BARROWS
STEEL PIG IRON OR INGOT BARROW



FIG. 4415

The handles are of one piece and pass around in front of the wheel, making the frame rigid, and forming an excellent support for attaching wheel. The bed and dash of barrow are of No. 10 steel. Size of bed, 22x24 inches; dash, 18 inches high. Weight of barrow, 110 pounds. Price.....each \$24.00

CHARGING BARROW
 For Charging Blast Furnaces or Gas Retorts



FIG. 4416

No.	Weight Each	Width Inches	Depth Inches	Length Inches	Diameter of Wheels Inches	Capacity Cubic Feet	Price Each
1	325	20	21½	54	30	10	\$75.00
3	375	24	26	54	30	14	83.00
5	450	28	30	57	30	20	90.00

Charging barrows of other sizes made to order. If desired, these barrows can be furnished with third wheel in place of legs. Price same as above.



FIG. 4417

GAS RETORT BARROW

This barrow is so made that the bottom of tray is very close to the ground, and, although it is very large (40x49 inches on top and holds 400 pounds coke), still the top of tray is only 23 inches from ground. List price.....each \$28.00

LANSING BARROWS



FIG. 4418

COAL BARROW WITH TWO WHEELS

Made of steel, banded around top, well painted.

These barrows are easily dumped forward without running back onto the operator. Axles have turned bearings. Wheels bored true to size. Coal barrows of any size made to order.

No.	Weight, Each, Lbs.	Size of Tray at Top	Diameter of Wheels Inches	Gage of Steel in Box	Capacity in Lbs. of Coal	Price, Each
D1	175	23x33	16	12	250	\$25.00
D2	185	24x35	16	12	350	27.00
D3	220	26x38	18	12	400	30.00
D4	240	27x40	18	12	500	32.00

K-1 LANSING CONCRETE BARROW

For Contractors, Cement and Concrete Workers

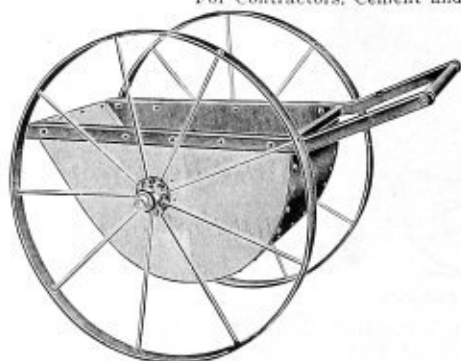


FIG. 4419

The bowl is so hung that it can be turned bottom up, making it especially convenient for laying the concrete base for sidewalks, reservoir bottoms and floors for reinforced concrete buildings. Handles are interchangeable and reversible. Length of body, 39½ inches; depth of body, 20 inches; width of body, 21 inches; gage of steel, No. 12; length over all, 58 inches; width over all, 32 inches; handle of 1-inch gas pipe; wheels, 42 inches in diameter, 2-inch tread; axle, 1¼-inch cold rolled; capacity, 6 cubic feet. Weight, 225 pounds. Wheels have staggered spokes.

We can furnish these barrows with legs at an additional cost of 75 cents per barrow, net.

List price.....each \$36.00



FIG. 4420

K-2 LANSING CONCRETE BARROW

The adaptability of the rig is seen at a glance. The long nose enables the load of concrete to be dumped into forms or moulds without spilling, where it would be impossible to use other wheelbarrows economically. Length of body, 42 inches; depth of body, 18½ inches; width of body, 20 inches; gage of steel, No. 12; length over all, 55 inches; width over all, 32½ inches; handle of 1-inch gas pipe; wheels, 30 inches diameter, 2½-inch tread; axle, 1¼-inch cold rolled; capacity, 6 cubic feet. Weight, 180 pounds.

List price.....each \$32.00

LANSING BARROWS

K-3 LANSING CONCRETE BARROW

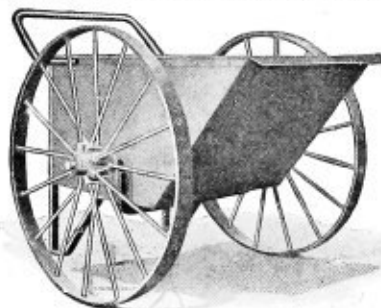


FIG. 4421

The bowl of this cart is large enough to hold a big load, and is hung so that it will dump easily.

Size of bowl, 36 inches long, 21 inches wide and 18 inches deep. Capacity, 7 cubic feet. Gage of steel, No. 14. Wheels 30 inches diameter, 2-inch tread. Spokes are staggered about 2 inches. Hub, self-oiling. Dropped axle, $1\frac{1}{4}$ inches square. Axle is held firmly in place by angle irons on each side. Weight, 195 pounds. List price.....each \$32.00

K-4 LANSING CONCRETE BARROW

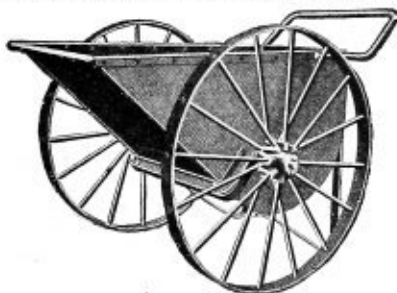


FIG. 4422

For the contractor, builder and concrete worker who discriminates in favor of first-class labor saving equipment.

This new Lansing cart has a carrying capacity of 7 cubic feet, dry material; 6 cubic feet sloppy concrete. It is fitted with a round bottom bowl, hung so that it will dump easily.

Size of bowl, $23\frac{1}{4}$ inches wide over all; $39\frac{1}{4}$ inches long at top; $19\frac{1}{2}$ inches deep. Bowl is made of 14 gage steel reinforced with angle iron entirely around top edge, forged corners.

Width of cart over all $36\frac{3}{4}$ inches; height, 32 inches; wheels, 30 inches diameter, 2-inch tread. Spokes are staggered about 2 inches. Self-oiling hub, dropped axle $1\frac{1}{4}$ inches square. Weight, complete, 190 pounds.

List price.....each \$32.00

TAMPERS



FIG. 4423

FIG. 4424

Regular size 4x4 by 4½ inches high.
Weight, about 10 pounds. Can furnish various sizes and weights.

STEEL BRICK AND MORTAR HODS

No. 747

No. 788



FIG. 4425

FIG. 4426

		Measure Inside, Inches	Price Per Dozen
No. 747	Mortar Hods	12x23	\$30.00
No. 788	Brick Hods..	7½x23	25.00



FIG. 4427

STEEL WAGON WHEELS

These wheels are made for very heavy work. Tires are 3x½-inch steel, spokes are ½-inch steel, and, as they are staggered and very firmly secured to hub and tire, they give the wheel great strength. The hub is made of one solid piece of iron bored for a tapering 2-inch axle. Length of hub 7¼ inches.

Weight Each	Diameter, Inches	No. of Spokes	Tires, Inches	Length and Bore of Hub	Price, Each
95	30	16	½x3	7¼ in. tapered for 2 in. axle	\$ 9.00
110	36	16	½x3	7¼ in. tapered for 2 in. axle	10.00
140	44	22	¾x3	7¼ in. tapered for 2 in. axle	12.00
97	24	16	½x5	7¼ in. tapered for 2 in. axle	10.00

2-inch steel axles turned and fitted for above wheels (length of axle to suit purchaser, not longer than 4½ feet).....\$8.00

STEEL WHEELS FOR BARROWS

These wheels are made with eight round spokes cast solid in a chilled iron hub, a steel bushing is cast in hub, making it indestructible.

The spokes have a shoulder under tire and are riveted on the outside, the tire being countersunk to receive same.



FIG. 4429

No.	Diameter, Inches	Thread, Inches	Length of Hub between Shoulders, Inches	Size of Spoke, Ins.	Price per Dozen
300	16	$\frac{1}{4} \times 1\frac{1}{4}$	6	$\frac{3}{8}$	\$12.50
301	17	$\frac{1}{8} \times 1\frac{3}{4}$	6	$\frac{1}{2}$	15.00
302	17	$\frac{3}{8} \times 2$	6	$\frac{1}{2}$	17.50

Barrows on which above wheels are to be used.

No. 300

- Fig. 4384 "Climax" Bolted.
 Fig. 4385 "Southern."
 Fig. 4386 "Michigan, Jr."
 Fig. 4387 "Pittsburgh" Red Dirt.

No. 301

- Fig. 4396 "Colon."
 Fig. 4397 B-1 and B-2 Lansing.
 Fig. 4398 F-1 Lansing.
 Fig. 4399 C-3 and C-4 Lansing.
 Fig. 4400 C-5 and C-6 Lansing.

- Fig. 4401 F-3 "Wolverine."
 Fig. 4402 F-3 $\frac{1}{2}$ Lansing.
 Fig. 4403 F-2 Lansing Mortar.
 Fig. 4404 F-4 Lansing Mortar.
 Fig. 4405 A-2 to A-17 Lansing Tubular.
 Fig. 4406 A-18 to A-19 Lansing Tubular.
 Fig. 4413 H-21 Lansing Tubular.
 Fig. 4414 H-22 Lansing Tubular.
 H-22 $\frac{1}{2}$ Lansing Tubular.

No. 302

Fits same barrows as shown under No. 301. Are designed for Extra Heavy Work.



FIG. 4430

STEEL WHEELS FOR K-1, K-3, K-4
CONCRETE CARTS

These wheels have self-oiling hubs.

No.	Diameter, Inches	Tires, Inches	Spokes, Inches	Length of Hub, Inches	Bore, Inches	Weight, Pounds	Price, Each	Where Used
770	30	$2 \times \frac{3}{8}$	$\frac{1}{2}$ Round	5	$1\frac{1}{8}$	45	\$6 00	K-3 & 4
790	42	$2 \times \frac{1}{2}$ Half Oval	$\frac{3}{8} \times \frac{1}{2}$ Oval	6	$1\frac{1}{4}$	50	7 25	K-1

SYRACUSE CONTRACTOR'S PLOW



FIG. 4431

No. 1—Contractor's—
two or four-horse.

Weight with wheel,
205 pounds.

Price\$30.00

Hard iron wearing parts. Extra heavy beam, share and strip. Will turn a furrow 5 to 9 inches deep. An excellent plow for general grading purposes.

SYRACUSE PAVEMENT PLOW

A GREAT FAVORITE WITH CONTRACTORS



FIG. 4432

No. 98—Four or six-
horse.

Weight, 280 pounds.

Price\$45.00

Adjustable and double reversible crucible steel point. Strongly built throughout. Specially adapted for tearing up cobblestones or macadam pavement.

SYRACUSE HEAVY CONTRACTOR'S PLOW



FIG. 4433

No. 99—Four to eight-
horse.

Weight, with shoe,
310 pounds.

Price\$60.00

Steel truss beam. Steel moldboard and landside. Separate shin piece. Heavy overlaid wrought steel share. Slight turning capacity. Suitable for severe grading purposes in shale or hard pan.

THE DOAN SCRAPER

For Cleaning Out and Back-Filling Ditches, Leveling Roads, Barnyards,
or Any Uneven Surfaces



FIG. 4434

The Doan Scraper is made of seasoned hardwood, well ironed and bolted. The bit is of extra hard steel ground to a cutting edge. The hounds are of $1\frac{1}{2} \times \frac{5}{8}$ wrought steel with $\frac{3}{8}$ cable chain.

To back-fill a trench, a rope or chain about 20 feet long is fastened to the cable chain on the scraper, and the team is hitched to the end of the rope. The team works on one side of the trench, and the man holding the scraper works on the opposite side. Operating in this manner, one Doan Scraper will do as much back-filling in a given length of time as 50 shovellers.

Width, 48 inches; weight, 75 pounds.

Prices upon application.

TOWNSEND WHEEL SCRAPER

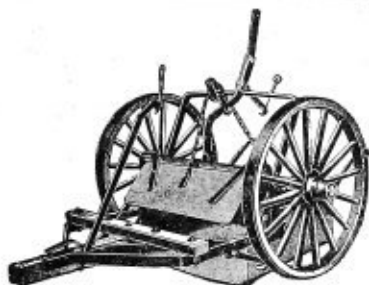


FIG. 4435

This is not a cheap scraper, thrown together simply to meet competition, but is one constructed of heavy and high-class material, to insure long and satisfactory service.

DESCRIPTION OF SIZES

No. 1. Capacity, 10 cubic feet; box made of No. 9 gage steel; Sarven wheels, best grade, 36 inches high, steel tire, $3 \times \frac{1}{4}$ inches; weight, 490 pounds; axles, $1\frac{1}{2}$ inches square steel.

No. 2. Capacity, 12 cubic feet; box made of No. 8 gage steel; Sarven wheels, best grade, 40 inches high, steel tire, $3 \times \frac{1}{8}$ inches; weight, 620 pounds; with apron, 670 pounds; axles, $1\frac{1}{2}$ inches square steel.

No. 2½. Capacity, 14 cubic feet; box made of No. 8 gage steel; Sarven wheels, best grade, 42 inches high, steel tire, $3 \times \frac{1}{8}$ inches; weight, 650 pounds; with apron, 690 pounds; axles, $1\frac{1}{2}$ inches square steel.

No. 3. Capacity, 17 cubic feet; box made of No. 7 gage steel; Sarven wheels, best grade, 45 inches high, steel tire, $3 \times \frac{1}{8}$ inches; weight, 775 pounds; with apron, 835 pounds; axles, $1\frac{1}{2}$ inches square steel.

No. 2½ and No. 3 size made regularly with snatch rod; the No. 2 only when so ordered.

Axles and spindles on our wheelers are made in one piece without welds.

Prices made on doubletrees and neckyokes on application.

While this scraper is displayed with APRON attached, it is not the intention to convey the impression that it is an inseparable and necessary feature.

The scraper is made to be used either with or without this appliance, which is furnished on specific orders only, and at a price separate and apart from the wheeler.

The value of this apron is indicated by the fact that we sell more scrapers with it than without. Parties using scrapers so equipped claim that at least 20 per cent more dirt reaches the dump than can be delivered otherwise.

Prices upon application.

THE KING SOLID STEEL SCRAPER

Without Runners



FIG. 4436

With Double Bottom



FIG. 4437

KING STEEL SCRAPER WITHOUT RUNNERS

The King fills a demand for a Scraper that will do all regular light work and still cost less than others.

It has a flange around the top made by turning back the edge of the bowl. This flange reinforces and stiffens the bowl and adds much to the strength and capacity of the scraper.

On account of its lightness, the King can often be used to great advantage in many kinds of work.

It can be handled more easily and rapidly than any other scraper made. Always furnished with runners unless otherwise ordered.

No.	Average Size in Inches	Capacity	Weight	One Dozen Packed for Export Measure
2K	32x28x10	5 cubic feet	65 pounds	22 cubic feet
3K	32x25x10	3 cubic feet	55 pounds	19 cubic feet

THE LANSING SOLID STEEL SCRAPER

With Runners, $\frac{1}{2}$ x $\frac{1}{2}$ Steel

FIG. 4438

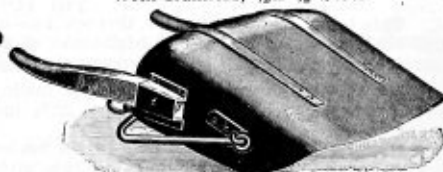


FIG. 4439

The Lansing Scraper is made from heavy steel. The bowl is pressed without sharp curves, angles, or overlaps.

The swivel, by which the scraper is pulled, works easily, and allows the bowl to adjust itself to any unevenness in the ground without losing off dirt.

The bowl is long and deep, is compact and rigid, and has large wearing surface.

The workmanship is complete in every detail. The Lansing fills easily, dumps easily, handles easily, and is the strongest, most durable drag scraper made.

The Lansing Scraper is made in three sizes.

It is always shipped with runners unless otherwise ordered.

No.	Size in Inches	Capacity	Weight Lbs.	One Dozen Packed for Export Measure
1L	33 $\frac{1}{2}$ x32x11 $\frac{1}{2}$	7 cu. ft.	98	25 cu. ft.
2L	31 $\frac{1}{2}$ x29x11 $\frac{1}{2}$	5 cu. ft.	88	22 cu. ft.
3L	32 x25x10 $\frac{3}{4}$	3 cu. ft.	78	21 cu. ft.

STEEL COAL SHUTES

These shutes are made of the best quality sheet steel. The ends are heavily banded. By special machinery the bottoms are corrugated, giving great strength without making the shute unnecessarily heavy. Usually furnished with angle edges.

TELESCOPE WAGON SHUTE



FIG. 4440

No.	Length of Shute	Length of Slide	Extreme Length Adjusted	Width Upper End	Width Lower End	Price, Each
1	8 feet	5 feet	12 feet	21 inches	12 inches	\$13.50
2	10 feet	7 feet	16 feet	21 inches	12 inches	18.00
3	12 feet	9 feet	20 feet	21 inches	12 inches	22.50

These shutes can be quickly adjusted to any length needed, not longer than the extreme length mentioned above.

TAPERED WAGON SHUTES, WITH FRAME OF ANGLE STEEL



FIG. 4441

The following sizes are kept in stock, 18 inches wide at top, 12 inches at bottom.

No. 11.	8 feet long	each	\$6.00
No. 12.	10 feet long	each	7.50
No. 13.	12 feet long	each	9.00

Made any length to order.

EXTENSION FOR TAPERED SHUTE



FIG. 4442

Price, per foot, 75 cents.

These extension shutes are made to fit small end of tapered wagon shutes, also small end of each other. Thus a tapered wagon shute may be extended to any length desired by adding extensions.

TAPERED WINDOW SHUTES



FIG. 4443

No. 21. Length, 5 feet; width at top, 24 inches. Longer shutes can be furnished at an additional price of 75 cents per foot. These shutes are used for emptying coal through windows or holes in sidewalk. Price, each, \$6.00.

MARTIN PATENT CASTER

Lacquered Bronze Finish

No. 21



FIG. 4444

No. 22



FIG. 4445

IRON WHEELS

No.	Style of Plate	Diameter of Wheels	Face of Wheels	Size of Plate	Size of Stem	Height Over All	Weight Per Set	List Set of Four
21	Round Plate	1	$\frac{5}{8}$	$1\frac{1}{4}$ diam.		$1\frac{1}{2}$	1 lb.	\$0.80
22	Oblong Plate	1	$\frac{5}{8}$	$1\frac{3}{8} \times 1\frac{7}{8}$		$1\frac{1}{2}$	1 lb.	.80
23	Stem Plate	1	$\frac{5}{8}$	$1\frac{1}{4}$ diam.	$\frac{3}{8} \times 1$	$1\frac{1}{2}$	1 lb.	.80
203	Wrought Stem	1	$\frac{5}{8}$	$1\frac{1}{4}$ diam.	$\frac{1}{4} \times 1\frac{5}{8}$	$1\frac{1}{2}$	1 lb.	.80
31	Round Plate	$1\frac{3}{8}$	$\frac{3}{8}$	$1\frac{5}{8}$ diam.		$1\frac{7}{8}$	2 lbs.	.85
32	Oblong Plate	$1\frac{3}{8}$	$\frac{3}{8}$	$1\frac{5}{8} \times 2\frac{1}{4}$		$1\frac{7}{8}$	2 lbs.	.85
33	Stem Plate	$1\frac{3}{8}$	$\frac{3}{8}$	$1\frac{5}{8}$ diam.	$\frac{3}{8} \times 1\frac{1}{8}$	$1\frac{7}{8}$	2 lbs.	.85
303	Wrought Stem	$1\frac{3}{8}$	$\frac{3}{8}$	$1\frac{5}{8}$ diam.	$\frac{5}{8} \times 1\frac{5}{8}$	$1\frac{7}{8}$	2 lbs.	.85
41	Round Plate	$1\frac{5}{8}$	$1\frac{1}{2}$	$1\frac{7}{8}$ diam.		$2\frac{1}{4}$	3 lbs.	.90
42	Oblong Plate	$1\frac{5}{8}$	$1\frac{1}{2}$	$1\frac{7}{8} \times 2\frac{3}{4}$		$2\frac{1}{4}$	3 lbs.	.90
43	Stem Plate	$1\frac{5}{8}$	$1\frac{1}{2}$	$1\frac{7}{8}$ diam.	$1\frac{1}{2} \times 1\frac{1}{4}$	$2\frac{1}{4}$	3 lbs.	.90
403	Wrought Stem	$1\frac{5}{8}$	$1\frac{1}{2}$	$1\frac{7}{8}$ diam.	$\frac{3}{8} \times 1\frac{5}{8}$	$2\frac{1}{4}$	3 lbs.	.90
51	Round Plate	$1\frac{7}{8}$	$\frac{9}{8}$	$2\frac{1}{8}$ diam.		$2\frac{5}{8}$	4 lbs.	1.00
52	Oblong Plate	$1\frac{7}{8}$	$\frac{9}{8}$	$2\frac{1}{8} \times 3\frac{1}{8}$		$2\frac{5}{8}$	4 lbs.	1.00
53	Stem Plate	$1\frac{7}{8}$	$\frac{9}{8}$	$2\frac{1}{8}$ diam.	$\frac{5}{8} \times 1\frac{7}{8}$	$2\frac{5}{8}$	4 lbs.	1.00
503	Wrought Stem	$1\frac{7}{8}$	$\frac{9}{8}$	$2\frac{1}{8}$ diam.	$\frac{3}{8} \times 1\frac{5}{8}$	$2\frac{5}{8}$	4 lbs.	1.00
61	Round Plate	$1\frac{3}{4}$	$\frac{3}{4}$	$2\frac{1}{2}$ diam.		$2\frac{3}{4}$	6 lbs.	1.25
62	Oblong Plate	$1\frac{3}{4}$	$\frac{3}{4}$	$2\frac{1}{2} \times 3\frac{1}{2}$		$2\frac{3}{4}$	6 lbs.	1.25
63	Stem Plate	$1\frac{3}{4}$	$\frac{3}{4}$	$2\frac{1}{2}$ diam.	$\frac{3}{4} \times 1\frac{7}{8}$	$2\frac{3}{4}$	6 lbs.	1.25
71	Round Plate	$2\frac{1}{4}$	$\frac{3}{4}$	$2\frac{1}{2}$ diam.		$3\frac{1}{4}$	7 lbs.	1.50
72	Oblong Plate	$2\frac{1}{4}$	$\frac{3}{4}$	$2\frac{1}{2} \times 3\frac{1}{2}$		$3\frac{1}{4}$	7 lbs.	1.50

One Set in a Box



FIG. 4446

STENGEL PATENT

CASTERS

IRON WHEELS

CUT SHOWS NO. 6A

No.	Style	Size of Plate, Inches	Size of Stem, Inches	Diam. of Wheels, Inches	Face of Wheels, Inches	Height Over All, Inches	Weight Per Set, lbs.	Carrying Capacity One Set in a Box, lbs.	List. Set of Four
2A	Oblong Plate	1 x 1½	1	1	5/16	1½	1	200	\$0.80
2B	Steel Stem	1½ x 1½	1	1	5/16	1½	1	200	.80
3A	Oblong Plate	1½ x 2	1	1½	3/8	1½	2	400	.85
3B	Steel Stem	1 Diam.	1	1½	3/8	1½	2	400	.85
3C	Spring	1	1	1½	3/8	1½	2	400	.85
4A	Oblong Plate	1½ x 2½	1½	1½	3/8	2½	3	600	.90
4B	Steel Stem	1 Diam.	1½	1½	3/8	2½	3	600	.90
4C	Spring	1½	1½	1½	3/8	2½	3	600	.90
5A	Oblong Plate	1½ x 2½	1½	1½	3/8	2½	4	750	1.00
5B	Steel Stem	1½ Diam.	1½	1½	3/8	2½	4	750	1.00
5C	Spring	1½	1½	1½	3/8	2½	4	750	1.00
6A	Oblong Plate	2 x 3	2	2	1/2	3	6	1500	1.25
6B	Piano Stem	2½ Diam.	2	2	1/2	3	6	1500	1.25
8A	Oblong Plate	2½ x 4	2½	2½	3/4	3½	11	2000	2.00
10A	"	3½ x 4½	3	3	3/4	4½	13	2500	2.50
11A	"	3½ x 5½	3½	3½	3/4	5½	24	3000	4.00
12A	"	4½ x 6½	4½	4½	1½	6	40	4000	7.00
14A	"	4½ x 7	5	5	1½	7½	68	5000	12.00
16A	"	5½ x 7½	6	6	1½	8½	105	6000	16.00
20A	"	5½ x 7½	7	7	1½	9½	128	7500	20.00



FIG. 4447

RIGID TRUCK

CASTER

HEAVY CONSTRUCTION

WIDE, FLAT FACE, IRON WHEELS

Carrying capacity 2000 to 600 lbs.

No.	Style	Size of Plate, In.	Diameter of Wheels, In.	Face of Wheels, In.	Height Over All, In.	Weight Each, lbs.	List. Each
6-W	Oblong Plate	3½ x 4½	2½	1½	2½	1½	\$0.40
8-W	"	3½ x 4½	3	1½	3½	2½	.55
10-W	"	3½ x 5½	3½	1½	4	3½	.75
11-W	"	4½ x 5½	4½	1½	4½	6	1.00
12-W	"	5 x 6½	5	2	5½	9	1.50
14-W	"	5½ x 7	6	2½	6½	14	2.25

TRUCK CASTERS

Rigid Truck Caster
Heavy Pattern No. 8

FIG. 4443

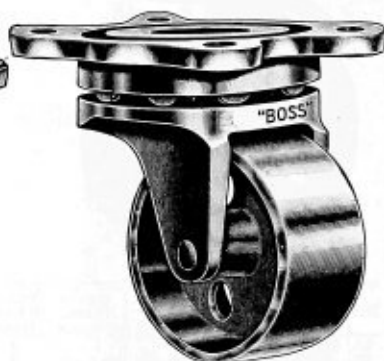
Boss Patent Caster
Truck Sizes No. 388

FIG. 4449

RIGID TRUCK CASTERS, HEAVY PATTERN, IRON WHEELS

No.	Diameter of Wheels	Face of Wheels	Size of Plate	*Bolt Holes Between Centers	Size of Bolt	Height Over All	Weight Each	List—Each
6	2 $\frac{1}{2}$	1	3 x 4 $\frac{1}{4}$ x1 $\frac{1}{4}$	1 $\frac{1}{8}$ x 3 $\frac{3}{8}$ x1 $\frac{1}{8}$	1 $\frac{1}{4}$	2 $\frac{3}{4}$	1 $\frac{1}{2}$ lbs.	\$0.30
7	2 $\frac{7}{8}$	1	3 x 4 $\frac{3}{4}$ x $\frac{5}{8}$	1 x 3 $\frac{7}{8}$ x1 $\frac{1}{8}$	1 $\frac{1}{4}$	3 $\frac{1}{4}$	1 $\frac{3}{4}$ lbs.	.35
8	3	1	3 x 4 $\frac{3}{4}$ x $\frac{5}{8}$	1 x 3 $\frac{7}{8}$ x1 $\frac{1}{8}$	1 $\frac{1}{4}$	3 $\frac{1}{4}$	2 lbs.	.40
10	3 $\frac{3}{8}$	1	3 $\frac{1}{2}$ x 4 $\frac{3}{4}$ x $\frac{5}{8}$	1 $\frac{1}{8}$ x 3 $\frac{7}{8}$ x1 $\frac{1}{8}$	1 $\frac{1}{4}$	4 $\frac{1}{8}$	2 $\frac{1}{2}$ lbs.	.50
11	4	1 $\frac{1}{2}$	3 $\frac{3}{8}$ x 5 $\frac{1}{8}$ x $\frac{3}{8}$	1 $\frac{1}{8}$ x 4 $\frac{1}{4}$ x1 $\frac{1}{8}$	1 $\frac{1}{4}$	4 $\frac{3}{4}$	3 $\frac{3}{4}$ lbs.	.75
12	5 $\frac{1}{4}$	1 $\frac{1}{2}$	3 $\frac{7}{8}$ x 7 x $\frac{3}{8}$	1 $\frac{1}{8}$ x 5 $\frac{1}{4}$ x1 $\frac{1}{8}$	1 $\frac{1}{4}$	5 $\frac{1}{8}$	6 $\frac{1}{2}$ lbs.	1.10
14	5 $\frac{3}{8}$	1 $\frac{3}{4}$	4 $\frac{3}{8}$ x 7 x $\frac{7}{8}$	1 $\frac{1}{8}$ x 5 $\frac{3}{4}$ x1 $\frac{1}{8}$	1 $\frac{1}{4}$	6	8 lbs.	1.40
16	7	1 $\frac{3}{4}$	4 $\frac{3}{4}$ x 8 $\frac{1}{4}$ x $\frac{7}{8}$	2 $\frac{3}{8}$ x 6 $\frac{5}{8}$ x1 $\frac{1}{2}$	1 $\frac{1}{2}$	7 $\frac{1}{8}$	12 lbs.	2.00
18	10	2 $\frac{1}{4}$	6 $\frac{3}{8}$ x11 $\frac{5}{8}$ x1 $\frac{1}{2}$	2 $\frac{5}{8}$ x10 $\frac{1}{2}$ x2	1 $\frac{1}{2}$	10 $\frac{7}{8}$	33 lbs.	5.50

*Last figure denotes distance from center of side hole to a point midway between centers of nearest end holes.

Packed in Bulk.

BOSS PATENT CASTERS

Disk bearings, with spacer. The spacer keeps disk bearings separated and prevents friction.

No.	Style Plate	Diameter of Wheels	Face of Wheels	Size of Plate	Bolt Holes Bet. Centers	Size of Bolt	Height Over All	Weight Per Set	List—Set of Four
377	Oblong	2 $\frac{1}{4}$	1 $\frac{1}{8}$	2 $\frac{1}{2}$ x 3 x1 $\frac{1}{4}$	1 $\frac{3}{4}$ x2 $\frac{3}{8}$	1 $\frac{1}{4}$	3 $\frac{1}{4}$	5 $\frac{1}{2}$ lbs.	\$ 2.50
388	Oblong	2 $\frac{1}{2}$	1 $\frac{1}{4}$	2 $\frac{7}{8}$ x 4 $\frac{1}{8}$ x1 $\frac{1}{4}$	1 $\frac{1}{2}$ x3 $\frac{1}{4}$	1 $\frac{1}{4}$	3 $\frac{5}{8}$	8 $\frac{1}{2}$ lbs.	2.75
390	Oblong	3	1 $\frac{1}{2}$	3 $\frac{1}{4}$ x 4 $\frac{3}{4}$ x $\frac{5}{8}$	2 x3 $\frac{3}{8}$	1 $\frac{1}{4}$	4 $\frac{1}{4}$	13 $\frac{1}{2}$ lbs.	4.00
391	Oblong	3 $\frac{1}{2}$	1 $\frac{3}{4}$	3 $\frac{3}{8}$ x 5 $\frac{3}{8}$ x $\frac{1}{2}$	2 $\frac{1}{4}$ x4 $\frac{1}{8}$	1 $\frac{1}{4}$	5 $\frac{1}{4}$	20 lbs.	6.50
390L	Oblong	4	1 $\frac{3}{8}$	3 $\frac{3}{8}$ x 4 $\frac{5}{8}$ x $\frac{5}{8}$	2 $\frac{1}{2}$ x3 $\frac{3}{8}$	1 $\frac{1}{4}$	5 $\frac{1}{2}$	16 $\frac{1}{2}$ lbs.	5.00
392	Oblong	4	2 $\frac{1}{8}$	4 x 6 x3 $\frac{3}{8}$	2 $\frac{1}{2}$ x4 $\frac{5}{8}$	1 $\frac{1}{4}$	5 $\frac{5}{8}$	26 lbs.	11.00
391L	Oblong	5	1 $\frac{5}{8}$	4 $\frac{1}{4}$ x 5 $\frac{3}{4}$ x $\frac{5}{8}$	3 x4 $\frac{1}{2}$	1 $\frac{1}{4}$	6 $\frac{3}{4}$	29 lbs.	11.00
396	Oblong	6	2 $\frac{1}{4}$	4 $\frac{1}{2}$ x 6 $\frac{3}{4}$ x $\frac{5}{8}$	2 $\frac{5}{8}$ x5 $\frac{3}{8}$	1 $\frac{1}{4}$	7 $\frac{3}{4}$	44 lbs.	16.00
397	Oblong	6	2 $\frac{3}{4}$	5 $\frac{7}{8}$ x 7 $\frac{3}{8}$ x $\frac{5}{8}$	4 $\frac{1}{8}$ x5 $\frac{3}{8}$	1 $\frac{1}{2}$	8 $\frac{1}{2}$	75 lbs.	26.00
400	Oblong	12	4	9 $\frac{1}{4}$ x10 $\frac{3}{4}$ x $\frac{5}{8}$	6 $\frac{1}{2}$ x8 $\frac{1}{2}$	1 $\frac{1}{2}$	14 $\frac{3}{4}$	252 lbs.	80.00

Packed in Bulk.

SHOVELS

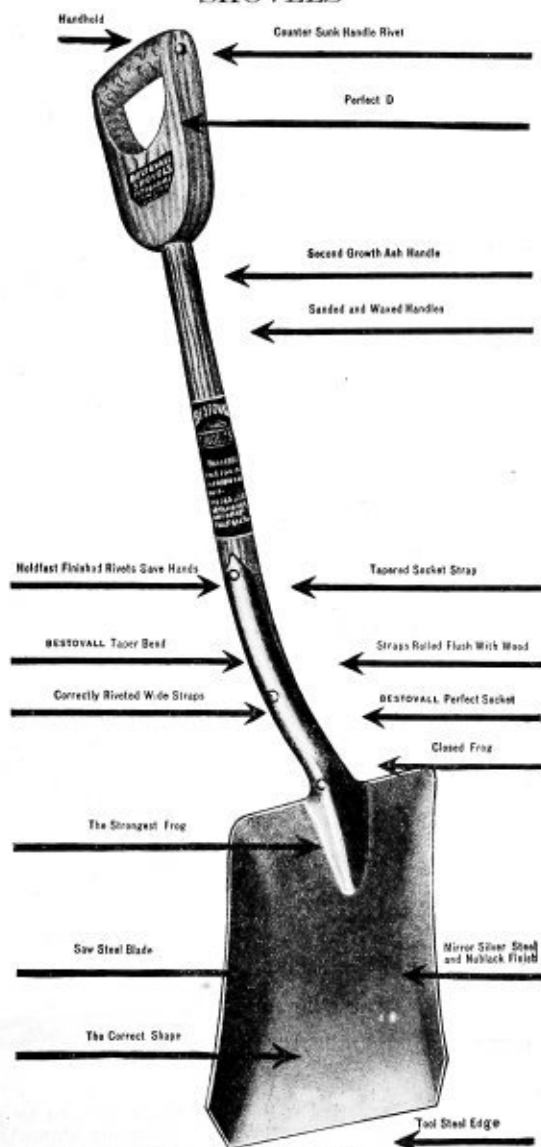


FIG. 4450

Above cut shows detail construction of our "BESTOVALL" and "FORT PITT" Shovels listed on following pages.

SHOVELS

DIMENSIONS

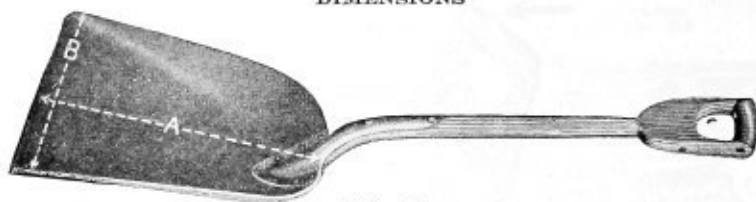


FIG. 4451

Dimensions given in this catalog are ascertained by measuring from top of blade to the point, as shown by the dotted lines on above illustration.

LIFT



FIG. 4452

"Lift" is the term used to indicate the distance from point of blade to floor when back of blade and upper end of handle are resting upon the floor or other line surface, and is ascertained as shown by the above illustration. The "Lift" can be changed as desired in plain back or back strap pattern tools. The "Lift" of hollow back tools being fixed by set dies, cannot be changed; but coal shovels and scoops are made in "Regular Lift," "Half Lift" and "Low Lift" to suit requirements.

LENGTH OF HANDLE

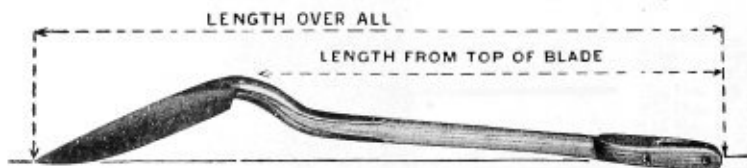


FIG. 4453

Length of handle can be varied to suit and is ascertained by placing the tool face downward upon a level surface and then measuring along the surface from extreme point of blade to extreme top of handle, being known as "length over all," or can be obtained by measuring from top of blade to top of handle as shown by above illustration.

PLAIN BACK CANAL, DIRT OR RAILROAD SHOVELS

"D" Handle
Square Point,
Dirt, Canal or
Railroad Shovel.

Made in
"Bestovall,"
"Fort Pitt,"
"Buckeye"
and "Monarch."



FIG. 4454

"D" Handle
Round Point, Dirt,
Canal or Railroad
Shovel. Made in
"Bestovall,"
"Fort Pitt,"
"Buckeye"
and "Monarch."



FIG. 4455



FIG. 4456

Long Handle Square Point, Dirt, Canal or Railroad Shovel. Made in "Bestovall," "Fort Pitt," "Buckeye" and "Monarch."

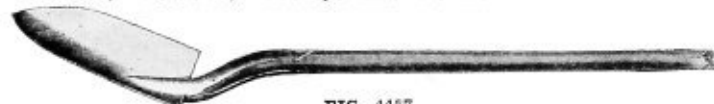


FIG. 4457

Long Handle Round Point, Dirt, Canal or Railroad Shovel. Made in "Bestovall," "Fort Pitt," "Buckeye" and "Monarch."



FIG. 4458

Square Point, Malleable "D" Handle Tamping Shovel. Made in "Bestovall" and "Fort Pitt."

DESCRIPTION OF BRANDS

"BESTOVALL"—Socket Strap, Solid Crucible Steel—Extra Heavy.

"FORT PITT"—Socket Strap, Best Cast Steel—Heavy Weight.

"BUCKEYE"—Plain Strap, Best Cast Steel—Medium Weight.

"MONARCH"—Plain Strap, Good Grade Cast Steel.

LIST PRICE PER DOZEN—POLISHED

Size	Size Blade Square Point	Size Blade Round Point	Bestovall	Fort Pitt	Buckeye	Monarch	Size
2	9 $\frac{3}{4}$ x 11 $\frac{3}{4}$	9 $\frac{1}{4}$ x 12 $\frac{3}{4}$	\$16.50	\$15.50	\$14.50	\$13.50	2
3	10 $\frac{1}{4}$ x 12 $\frac{1}{4}$	9 $\frac{1}{2}$ x 13 $\frac{1}{4}$	17.00	16.00	15.00	14.00	3
4	10 $\frac{3}{4}$ x 12 $\frac{3}{4}$	9 $\frac{3}{4}$ x 13 $\frac{3}{4}$	17.50	16.50	15.50	14.50	4
5	11 $\frac{1}{4}$ x 13 $\frac{1}{4}$	.....	18.00	17.00	16.00	15.00	5
6	11 $\frac{3}{4}$ x 13 $\frac{3}{4}$	.....	18.50	17.50	16.50	15.50	6

For malleable "D" Tamping Shovels add \$1.00 per dozen net extra.

Black Shovels 90c net per dozen less than Polished.

Half Polished Shovels 45c net per dozen less than Polished.

HOLLOW BACK CANAL DIRT OR RAILROAD SHOVELS



FIG. 4459

"D" Handle Square Point Dirt, Canal or Railroad Shovel. Made in "Gage Special," "Allegheny," "Helmet" and "Duquesne."



FIG. 4460

"D" Handle Round Point Dirt, Canal or Railroad. Made in "Gage Special," "Allegheny," "Helmet" and "Duquesne."



FIG. 4461

Long Handle Square Point Dirt, Canal or Railroad Shovel. Made in "Gage Special," "Allegheny," "Helmet" and "Duquesne."



FIG. 4462

Long Handle Round Point Dirt, Canal or Railroad. Made in "Gage Special," "Allegheny," "Helmet" and "Duquesne."

DESCRIPTION OF BRANDS

"GAGE SPECIAL"—Hollow Back, Solid Crucible Steel—Extra Heavy.

"ALLEGHENY"—Hollow Back, Best Cast Steel—Heavy Weight.

"HELMET"—Hollow Back, Best Cast Steel—Medium Weight.

"DUQUESNE"—Hollow Back, Good Grade Cast Steel.

LIST PRICE PER DOZEN—POLISHED

Size	Size Blade Square Point	Size Blade Round Point	Gage Special	Allegheny	Helmet	Duquesne	Size
2	9 $\frac{3}{4}$ x 11 $\frac{3}{4}$	9 $\frac{1}{4}$ x 12 $\frac{3}{4}$	\$15.50	\$14.50	\$13.50	\$12.50	2
3	10 $\frac{1}{4}$ x 12 $\frac{1}{4}$	9 $\frac{1}{2}$ x 13 $\frac{1}{4}$	16.00	15.00	14.00	13.00	3
4	10 $\frac{3}{4}$ x 12 $\frac{3}{4}$	9 $\frac{3}{4}$ x 13 $\frac{3}{4}$	16.50	15.50	14.50	13.50	4
5	11 $\frac{1}{4}$ x 13 $\frac{1}{4}$	.....	17.00	16.00	15.00	14.00	5
6	11 $\frac{3}{4}$ x 13 $\frac{3}{4}$	.....	17.50	16.50	15.50	14.50	6

Black Shovels—90c net per dozen less than Polished.

Half Polished—45c net per dozen less than Polished.

MOULDER'S PLAIN BACK SHOVELS

Plain "D"
Handle

FIG. 4463

Patent Split
"D" Handle

FIG. 4464

DESCRIPTION OF BRANDS

"BESTOVALL"—Socket Strap, Solid Crucible Steel—Extra Heavy.

"FORT PITT"—Socket Strap, Best Cast Steel—Heavy.

"MONARCH"—Plain Strap, Good Grade Cast Steel.

Specify style of handle wanted when ordering.

LIST PRICE PER DOZEN—POLISHED

Size	Size Blade	Bestovall	Fort Pitt	Monarch
2	9 3/4 x 12	\$16.50	\$15.50	\$13.50

MINING MACHINE SHOVELS



FIG. 4465

Plain Back, Socket Strap, Extra Long Handle. Malleable "D."

Size 4 "BESTOVALL"—Solid Crucible Steel.....per dozen, polished \$22.75

4 "FORT PITT"—Solid Cast Steel.....per dozen, polished 21.75

Black Shovels—90c per dozen net less than polished.

Half Polished—45c per dozen net less than polished.

PLAIN BACK SPADES

"D" Handle Square Point

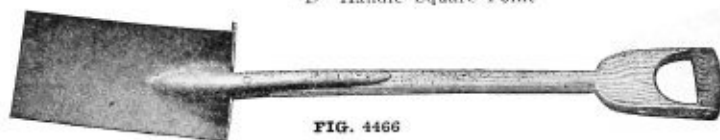


FIG. 4466

Long Handle
Square Point

FIG. 4467

LIST PRICE, PER DOZEN—POLISHED

	Size 2	Size 3
"BESTOVALL"—Socket Strap, Solid Crucible Steel.....	\$16.50	\$17.00
"FORT PITT"—Socket Strap, Best Cast Steel.....	15.50	16.00
"MONARCH"—Plain Strap, Good Grade Cast Steel.....	13.50	14.00

POST AND DRAIN SPADES

PLAIN BACK—SOCKET STRAP

Post Spade



FIG. 4468

Drain Spade

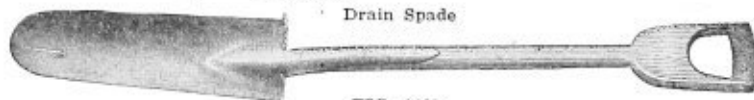


FIG. 4469

LIST PRICE PER DOZEN—POLISHED

Size	Length Blade	"Bestovall"	"Fort Pitt"
2	14 in.	\$20.00	\$19.00
3	16 in.	20.50	19.50
4	18 in.	21.00	20.00
5	20 in.	21.50	20.50
6	22 in.	22.00	21.00

Black Spades—90c net per dozen less than polished.

Half Polished Spades—45c net per dozen less than polished.

BALDWIN'S PLAIN BACK LUTHER BURBANK
GARDEN SPADE

Blade is one-half inch wider at the point than at the heel, half round point and sharpened, causing it to cut its full width, thereby eliminating the friction and labor attached to the old style blunt point spade.



FIG. 4470

No. 2 Blade 6½ inches by 12 inches.

Luther Burbank No. GLBDS2	"D" Handle	Black..List per dozen	\$16.50
Luther Burbank No. GLBLS2	Long Handle	Black..List per dozen	16.50

BALDWIN'S VANADIUM STEEL BRAND CONCRETE AND LOOSE MATERIAL SHOVEL

We have met the growing demand for a High Grade Concrete and Loose Material Shovel in this Vanadium Concrete Shovel. Blades made from high carbon Vanadium Steel—drawn and tempered. Drop points—which avoid friction and wear; only the point coming in contact with the surface. XX Northern Ash Handles sanded and waxed, hand scoured or silver steel finish.

This Vanadium Steel Shovel is especially designed for those who handle concrete or loose material and demand usage.

We guarantee this shovel to outwear any shovel on the market.

This Vanadium Concrete shovel is practically flat with drop point making it attractive to the workmen, as they push it into the material with less effort and less friction.

Packed one-half dozen burlapped.



FIG. 4471

Size 2.	Silver Steel.....	List price per dozen	\$22.00
Size 3.	Silver Steel.....	List price per dozen	22.00
Size 4.	Silver Steel.....	List price per dozen	22.00
Size 5.	Silver Steel.....	List price per dozen	22.00

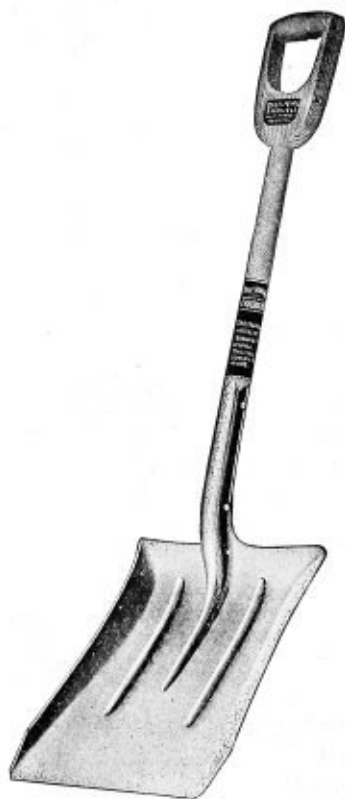
PLAIN BACK PERFORATED CONCRETE SPADES WITH D HANDLES "BESTOVALL" BRAND



FIG. 4472

Blade Dimensions, No. 2, 7½x12 inches.

Price per dozen—Black.....\$28.00

"GAGE SPECIAL" THREE RIB COAL SHOVEL**FIG. 4473**

"Gage Special" three rib brand has all the high grade features, high carbon open hearth steel with crucible analysis—flat bottom rounded corners clipped back about four inches, no sharp corners to keep it from slipping into the coal pile easily. High grade northern ash handles sanded and waxed, every socket is rolled into the handle and thoroughly milled.

Shaped, set and hung correctly.

Practical miners tell us they do more work with less effort with this shovel than any coal shovel they have ever used. Further they state that about three to four Gage Special Coal Shovels last longer than ten of the ordinary coal shovels.

Practical miners' ideas have been applied to this shovel. It is built right, they approve it.

"Gage Special" Coal Shovels are furnished in SILVER FINISH only. They are packed in bundles of one-half dozen each, neatly burlapped. This method of packing insures their delivery to the user in the same condition as they leave our factory.

COAL AND COKE SHOVELS

HOLLOW BACK

"D" Handle



FIG. 4474

Long Handle

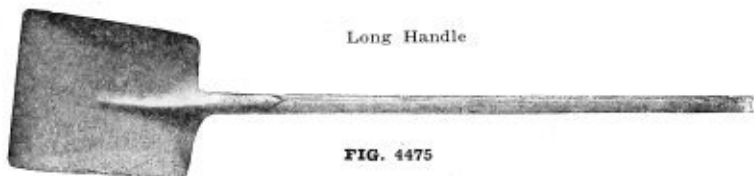


FIG. 4475

DESCRIPTION OF BRANDS

"GAGE SPECIAL"—Hollow Back, Solid Crucible Steel, Silver Finish. See complete description on preceding page.

"ALLEGHENY"—Hollow Back, Best Cast Steel—Extra Heavy.

"HELMET"—Hollow Back, Best Cast Steel—Medium Weight.

"DUQUESNE"—Hollow Back, Cast Steel—Market Grade.

LIST PRICE PER DOZEN—POLISHED

Size	Size Blade	Gage Special	Allegheny	Helmet	Duquesne
1	13½x14	\$18.50	\$17.50	\$16.50	\$15.50
2	14 x14½	19.00	18.00	17.00	16.00
3	14½x15	19.50	18.50	17.50	16.50
4	15 x15½	20.00	19.00	18.00	17.00
5	15½x16	20.50	19.50	18.50	17.50

Black Coal Shovels—90 cents net per dozen less than Polished.

Half Polished Coal Shovels—45 cents net per dozen less than Polished.

HOLLOW BACK SCOOPS

NARROW MOUTH OR EASTERN PATTERN LOCOMOTIVE AND COAL
SCOOPS

DESCRIPTION OF BRANDS

"GAGE SPECIAL"—Hollow Back, Solid Crucible Steel, Silver Finish. See complete description on page 1575.

"ALLEGHENY"—Hollow Back, Best Cast Steel—Extra Heavy.

"HELMET"—Hollow Back, Best Cast Steel—Medium Weight.

"DUQUESNE"—Hollow Back, Cast Steel—Market Grade.

LIST PRICE PER DOZEN—POLISHED

Size	Size Blade	Gage Special	Allegheny	Helmet	Duquesne
2	11 x 15	\$18.00	\$17.00	\$16.00	\$15.00
3	11½ x 15½	18.50	17.50	16.50	15.50
4	12 x 16	19.00	18.00	17.00	16.00
5	12½ x 16½	19.50	18.50	17.50	16.50
6	13 x 17	20.00	19.00	18.00	17.00
7	13¾ x 17½	20.50	19.50	18.50	17.50
8	13¾ x 18	21.00	20.00	19.00	18.00

Black Scoops—90 cents net per dozen less than polished.

Half Polished Scoops—45 cents net per dozen less than Polished.

HOLLOW BACK SCOOPS

WIDE MOUTH OR WESTERN PATTERN GRAIN SCOOP



FIG. 4478

Made in "GAGE SPECIAL," "ALLEGHENY" and "DUQUESNE" Brands. Can be furnished with either "D" or long handles.

LIST PRICE PER DOZEN—POLISHED

Size	Size Blade	Gage Special	Allegheny	Duquesne
4	12½x15½	\$20.00	\$19.00	\$17.00
5	13½x16	20.50	19.50	17.50
6	13½x16½	21.00	20.00	18.00
7	13¾x17	21.50	20.50	18.50
8	14¼x17½	22.00	21.00	19.00
9	14¼x18	22.50	21.50	19.50
10	14½x18¾	23.00	22.00	20.00
11	14¾x19¼	24.00	23.00	21.00
12	15 x19¾	25.00	24.00	22.00

If above are wanted black, deduct 90 cents per dozen from net price. If wanted half polished or satin finish, deduct 45 cents per dozen from net price.

HOLLOW BACK CHARGING SCOOPS

"D" HANDLE



FIG. 4479

Made in "GAGE SPECIAL" only.

LIST PRICE PER DOZEN—POLISHED

Size	Size Blade	
3	11¼x15½	\$20.00
4	11½x16	20.50
5	12 x16½	21.00
6	12¾x17	21.50

If wanted black, deduct 90 cents per dozen from net price.

If wanted half polished or satin finish, deduct 45 cents per dozen from net price.

"GIANT" ALL STEEL SHOVELS AND SCOOPS

The handle and blade is made of one solid piece, warranted cast steel. It is easy to handle, as no straps or rivets are required.

"D" Handle, Square Point Shovel

**FIG. 4480**

"D" Handle Round Point Shovel

**FIG. 4481**

"D" Handle Scoop

**FIG. 4482**

List price, per dozen:

SHOVELS

Square Point			Round Point		
Size	Black	Polished	Size	Black	Polished
2	\$14.50	\$15.00	2	\$14.50	\$15.00
3	15.00	15.50	3	15.00	15.50
4	15.50	16.00	..	.....	.....

SCOOPS

Size 3. Black	\$16.50
Size 4. Black	17.00
Size 5. Black	17.50
Size 6. Black	18.00

HOLLOW BACK FURNACE SCOOPS**FIG. 4483**

Furnished in either "D" or long handle and in "DUQUESNE" Brand only.
Size of blade, 9 $\frac{1}{4}$ x14. Polished.....per dozen \$14.25

If above are wanted black, deduct 90 cents per dozen from net price.

If wanted half polished or satin finish, deduct 45 cents per dozen from net price.

SNOW SHOVELS HOLLOW BACK

Long Handle No. 500



FIG. 4484

"D" Handle No. 600



FIG. 4485

- No. 500. Long Handle, Hollow Back, Black Finish.....per dozen \$ 8.00
No. 600. "D" Handle, Hollow Back, Black Finish.....per dozen 10.00

GALVANIZED SNOW SHOVELS

No. 34

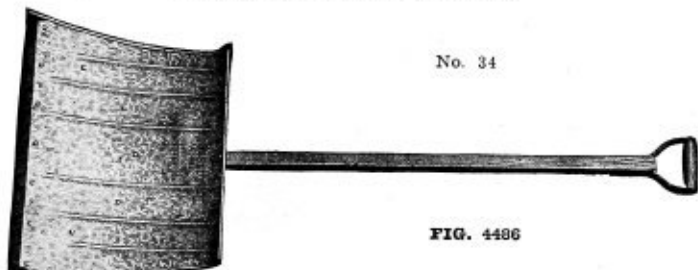


FIG. 4486

No. 33

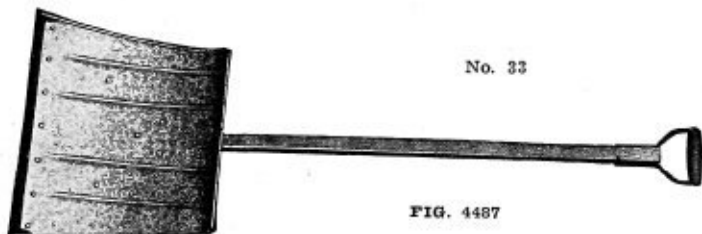


FIG. 4487

Improved Galvanized Steel Blade Snow Shovel, with angle iron braces extending from handle at top of blade to the extreme outer corners at point.

- No. 34. 21x16" Bladeper dozen \$13.50
No. 33. 17x15½" Bladeper dozen 12.75

SIDEWALK SCRAPERS



FIG 4488

No. 700. Blackper dozen \$5.50

ICE SCOOP, GALVANIZED



FIG 4489

Size No. 2. Price.....per dozen \$25.00

"BESTOVALL" TELEGRAPH SHOVELS AND SPOONS

Telegraph Shovel



FIG. 4490

Telegraph Spoon



FIG. 4491

LIST PER DOZEN—BLACK

6-foot handle, 9-inch strap.....	\$20.00
7-foot handle, 9-inch strap.....	22.00
8-foot handle, 9-inch strap.....	24.00
9-foot handle, 9-inch strap.....	26.00
10-foot handle, 9-inch strap.....	28.00
11-foot handle, 9-inch strap.....	32.00
12-foot handle, 9-inch strap.....	36.00

For straps longer than 9-inch, add \$1.00 per dozen to net price for each additional 9 inches or portion thereof.

MORTAR HOES

POLISHED BLADES, BRONZE FINISH



FIG. 4492

No. MR10. Solid shanks, 10-inch blades, 6-ft. handles.....per dozen \$25.40

MORTAR-MIXER HOES

POLISHED BLADES. BRONZE FINISH. TWO HOLES IN BLADE



FIG. 4493

No. MM10. Solid shanks, 10-inch blades, 6-ft. handles.....per dozen \$27.90

STREET HOES

POLISHED BLADES, BRONZE FINISH



FIG. 4494

No. SH12. Solid shanks, 12-in. blades, 6-ft. handles.....per dozen \$28.90

STREET CLEANING HOES

BLUE FINISH

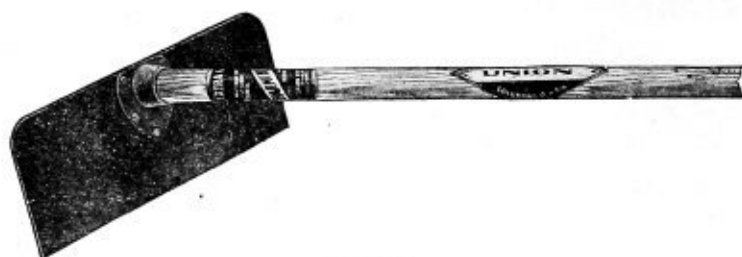


FIG. 4495

No. SCH14. Heavy steel blade, $14 \times 6\frac{1}{2}$ inches, malleable iron handle
 socket, 6-ft. heavy handles.....per dozen \$15.00

RAILROAD SCUFFLE HOES

HEAVY BRACED MALLEABLE SHANKS

BRONZE FINISH



FIG. 4496

No. RSH. $4 \times 8\frac{1}{2}$ -inch steel blades, 5-ft. handles.....per dozen \$12.00
 No. RSHD. $4 \times 8\frac{1}{2}$ -inch steel blades, mall. D on 4-ft. handles. ..per dozen 13.50

**"BESTOVALL" COKE FORKS,
30 INCH WOOD D HANDLES**

**FIG. 4497**

Nos.	No. Tines	Length Inches	Width, Inches	Space Between Tines, Inches	List, Per Doz.
708	8	16	11½	1¼	\$20.00
710	10	17	14	1¼	24.00
712	12	16	18	1¼	28.00
712½	12	17	16	1	28.00
714	14	17	20¼	1¼	33.00
714½	14	17	18	1	33.00
716	16	17	20	1	40.00
716½	16	17	18	¾	40.00

Can furnish malleable "D" handles at same price. For 36 inch handles add \$1.00 per dozen to list.

"BESTOVALL" COAL FORKS

812½	12	16	13	¾	\$29.00
814	14	16	14	¾	33.00
816	16	16	16	¾	40.00

Can furnish with malleable "D" handles at same price as wood "D." For 36-inch handles add \$1.00 per dozen to list.

OTSEGO COKE FORKS

**FIG. 4498**

COKE FORKS, DIAMOND TINES; 30 INCH HANDLE, WITH WOOD D

Nos.	No. Tines	Length, Inches	Spread (ex- treme width) Inches	Weight Per Doz., About, Lbs.	List, Per Doz.
910	10	17	14	90	\$24.00
912	12	18	18	100	28.00
914	14	19	20½	110	33.00
916	16	17	19½	115	40.00

"BESTOVALL" STONE OR BALLAST FORKS

**FIG. 4499**

NATURAL FINISH, SQUARE TINES; 30 INCH HANDLE, WOOD D

98S	8	13½	10½	84	\$20.00
100S	10	14	13	96	25.00
102S	12	13½	11½	102	29.00
102SW	12	14	13	110	29.00
104S	14	13½	12	116	33.00

REGULAR FOUR-TINE MANURE FORKS

OVAL TINES

No. S44½



FIG. 4500

No. S4W



FIG. 4501

FIRST QUALITY—Tines Full Polished—Bronze Finish.

SECOND QUALITY—Tines Full Polished—Bronze Finish.

Description	First Quality		Second Quality	
	No.	Per Dozen	No.	Per Dozen
Strap Ferrules, 4 ft. Bent Handles.....	S44	\$19.00	YS44	\$17.50
Strap Ferrules, 4½ ft. Bent Handles.....	S44½	19.00	YS44½	17.50
Strap Ferrules, Mall. D. Bent Handles.....	S4D	20.25	YS4D	18.75
Strap Ferrules, Wood D Bent Handles.....	S4W	24.25	YS4W	22.75

Above Forks are put up one-half dozen in a bundle. Tines on First and Second Quality Forks only are burlapped. Handles on above Forks are about 1½ inches diameter. Tines on First Quality Forks, about 12 inches long; on Second, a little shorter. Weight of No. S44½, about 41 pounds per dozen.

Longer Handles—For longer handles than 4½ feet, add \$1.00 per dozen to list for each 6 inches.

Riveting—For riveting shanks, add 20 cents net per dozen.

SIX-TINE MANURE FORKS

POLISHED OVAL TINES—BRONZE FINISH



FIG. 4502

Description	First Quality		Second Quality	
	No.	Per Dozen	No.	Per Dozen
Strap Ferrules, 4 ft. Bent Handles.....	S64	\$31.50	YS64	\$29.50
Strap Ferrules, 4½ ft. Bent Handles.....	S64½	31.50	YS64½	29.50
Strap Ferrules, Mall. D Bent Handles.....	S6D	32.75	YS6D	30.75
Strap Ferrules, Wood D Bent Handles.....	S6W	36.75	YS6W	34.75

Above Forks put up one-half dozen in a bundle; Tines burlapped. Handles about 1¾ inch diameter; Tines on First Quality Forks, about 13 inches long; on Second Quality, a little shorter. Weight of No. S64½, about 48 pounds per dozen.

Longer Handles—For longer handles than 4½ feet, add \$1.00 per dozen to list for each 6 inches.

Riveting—For riveting shanks, add 20 cents net per dozen.

HEAVY MILL AND STREET FORKS

HALF POLISHED DIAMOND TINES—STRAP FERRULES, BLUE FINISH



FIG. 4503

No.	Per Dozen	Description	
EHM4W	\$33.50	Four 16 in. Extra Heavy Tines	27 in. Wood D Handles
EHM5W	43.50	Five 16 in. Extra Heavy Tines	27 in. Wood D Handles
HM6W	45.50	Six 14 in. Heavy Tines	30 in. Wood D Handles

Put up one-half dozen in a bundle; Tines not burlapped. Weight of No. HM4W, about 56 pounds, and No. HM5W, 72 pounds per dozen.

Iron D Handles—Iron D handles can be furnished at same price as wood D.

Longer Handles—For 4 or 4½ ft. handles, deduct \$2.00 per dozen from wood D list.

Riveting—For riveting shanks, add 20 cents net per dozen.

STEEL GARDEN RAKES BRONZE FINISH, ROUND BOWS



FIG. 4504

No.	Per Dozen	Description
B10	\$17.75	10 Curved Teeth, 5 ft. Handles
B12	19.25	12 Curved Teeth, 5½ ft. Handles
B14	20.75	14 Curved Teeth, 5½ ft. Handles
B16	22.25	16 Curved Teeth, 5½ ft. Handles

Put up one dozen in a bundle; Heads not burlapped. Weight of No. B14, about 39 pounds per dozen.

STEEL GARDEN RAKES BRONZE FINISH, SINGLE SHANKS, STRAIGHT TEETH



FIG. 4505

No.	Per Dozen	Description
S10	\$14.75	10 Straight Teeth, 5 ft. Handles
S12	16.25	12 Straight Teeth, 5½ ft. Handles
S14	17.75	14 Straight Teeth, 6 ft. Handles
S16	19.25	16 Straight Teeth, 6 ft. Handles
S18	20.75	18 Straight Teeth, 6 ft. Handles

Put up one dozen in a bundle; Heads not burlapped. Weight of No. S12, about 32 pounds per dozen.

MALLEABLE GARDEN RAKES BLUE FINISH, SINGLE SHANKS



FIG. 4506

No.	Per Dozen	Description
MS10	\$5.50	10 Straight Teeth, 5 ft. Handles
MS12	6.00	12 Straight Teeth, 5½ ft. Handles
MS14	6.50	14 Straight Teeth, 5½ ft. Handles
MS16	7.00	16 Straight Teeth, 5½ ft. Handles

Put up one dozen in a bundle; Heads not burlapped. Weight of No. MS12, about 27 pounds per dozen.

STEEL ASPHALT OR TAR RAKES



STRAP FERRULES
BLACK FINISH
SQUARE DROP SHANKS

FIG. 4507

No.	Per Dozen	Description
A14D	\$28.50	14 Teeth, 18 in. Shanks, 5 ft. Ash Handles

Put up one-half dozen in a bundle; Heads not burlapped. Weight, about 66 pounds per dozen.

STEEL ROAD RAKES

EXTRA HEAVY—BLACK FINISH



FIG. 4508

SINGLE SHANKS

No.	Per Dozen	Description
R12	\$21.75	12 Straight Teeth, Black Finish, 6 ft. Handles
R14	23.25	14 Straight Teeth, Black Finish, 6 ft. Handles
R16	24.75	16 Straight Teeth, Black Finish, 6 ft. Handles

Put up one-half dozen in a bundle; Heads not burlapped. Weight of No. R14, about 51 pounds per dozen.

Strap Ferrules—For Strap Ferrules, add \$1.50 per dozen to list.

HANDLES STRAIGHT HAY FORK



FIG. 4509

Bored and Chucked, Without Ferrules

Length	feet	4	4½	5	5½	6	6½	7	8
XX	per dozen	\$4.90	5.30	6.50	7.90	9.90	11.40	13.20	17.30
X	per dozen	3.20	3.60	4.20	5.10	6.70	8.30	10.00	14.20

BENT HAY FORK



FIG. 4510

Bored and Chucked, Without Ferrules

Length	feet	4	4½	5	5½	6	6½	7	8
XX	per dozen	\$5.60	6.00	7.40	8.90	10.90	12.50	14.40	18.90
X	per dozen	3.90	4.40	5.00	6.00	7.70	9.40	11.20	15.60

MANURE FORK



FIG. 4511

Bored and Chucked, Without Ferrules

Length	feet	4	4½
XX	per dozen	\$5.60	6.00
X	per dozen	3.90	4.40

GARDEN RAKE



FIG. 4512

Bored and Chucked

		Without Ferrules			Plain, with Ferrules Attached No Caps		
Length	feet	5	5½	6	5	5½	6
XX	per dozen	\$5.70	7.00	8.80	6.70	8.00	9.80
X	per dozen	3.90	4.70	6.20	4.90	5.70	7.20

FIELD AND GARDEN HOE



FIG. 4513

Bored and Chucked

		Without Ferrules		Plain, with Ferrule Attached, No Caps	
Length	feet	4½	4½	4½	4½
XX	per dozen	\$4.60	4.60	5.60	5.60
X	per dozen	3.40	3.40	4.40	4.40

In ordering, specify if handles are for Shank or Socket Hoes.

HANDLES—CONTINUED MORTAR HOE



FIG. 4514

Bored and Chucked

	Without Ferrules		With Plain Ferrules Attchd.	
	5½	6	5½	6
Length feet				
XX .....per dozen	\$7.90	9.90	9.05	11.05
X .....per dozen	5.10	6.70	6.25	7.85

In ordering, specify for Shank or Socket Hoes.

MALLEABLE "D" MANURE AND SPADING FORK



FIG. 4515

Bored and Chucked

Without Ferrules—Grade XX.....per dozen \$8.10; Grade X.....per dozen \$6.60
 With Strap Ferrules and Caps, attached—Grade XX.....per dozen 11.50
 With Strap Ferrules and Caps, attached—Grade X.....per dozen 10.00

WOOD "D" COAL, COKE AND STONE FORK



FIG. 4516

Without Ferrules—Grade XX.....per dozen \$8.90; Grade X.....per dozen \$7.40
 With Strap Ferrules and Caps, attached—Grade XX.....per dozen 13.40
 With Strap Ferrules and Caps, attached—Grade X.....per dozen 11.90

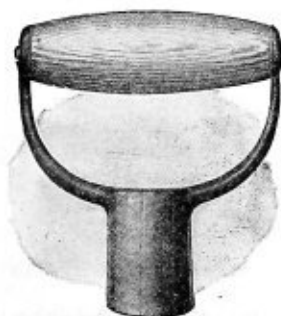


FIG. 4517

MALLEABLE "D" TOPS

With Riveted
Wood Grips...
.....per dozen \$3.00

ALL MALLEABLE "D" TOPS

Price...per dozen \$4.00



FIG. 4518

WOOD "D" SHOVEL, SCOOP AND SPADE HANDLES

SHOVEL HANDLE, AMES' BEND



FIG. 4519

Grade	XX	X
List	per dozen \$8.90	7.40

CHISHOLM SHOVEL, SPADE OR SCOOP, BENT



FIG. 4520

Grade	XX	X
List	per dozen \$8.60	7.10

REGULAR SCOOP HANDLE



FIG. 4521

Grade	XX	X
List	per dozen \$8.90	7.40

SPADE HANDLE



FIG. 4522

Grade	XX	X
List	per dozen \$8.60	7.10

When ordering above Handles, always specify the name of the tool for which the Handles are intended.

LONG SHOVEL SCOOP AND SPADE HANDLES

SHOVEL HANDLE, AMES' BEND



FIG. 4523

Length	Grade XX	X
4½ ft.	List per dozen \$8.00	\$5.70

CHISHOLM SHOVEL, SPADE OR SCOOP HANDLE



FIG. 4524

Length	Grade XX	X
4½ ft.	List per dozen \$8.00	\$5.70

REGULAR SCOOP HANDLE



FIG. 4525

Length	Grade XX	X
4½ ft.	List per dozen \$8.00	\$5.70

SPADE HANDLE



FIG. 4526

Length	Grade XX	X
4½ ft.	List per dozen \$7.70	\$5.40

When ordering above Handles always specify the name of the Tool for which the Handles are intended.

VAUGHAN POST HOLE AUGER

STEEL PIPE HANDLES—FORGED STEEL BLADES—MALLEABLE IRON
AND POINTS PAINTED BLACK

FIG. 4527

Length of handles 44 inches, diameter $\frac{7}{8}$ -inch. Length of point underneath blades, $3\frac{3}{4}$ inches. Diameter of hole in top for crossbar, $1\frac{1}{2}$ inches.

Crossbars not furnished with augers.

Length of augers over all, all sizes, 49 inches.

Sizes, inches	4	5	6	7	8	9	10
Per dozen, all sizes.....	\$18.00						

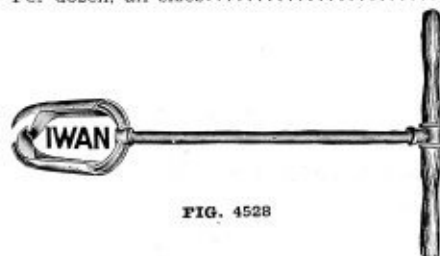


FIG. 4528

IWAN'S POST HOLE
AUGERS

For boring post holes and wells, for telegraph, telephone and other electric uses.

Best cast steel blades thoroughly tempered, highly polished.

Sizes, inches	3	4	5	6	7	8	9	10	12	14	16
Per dozen	\$28.00	28.00	28.00	28.00	30.00	30.00	32.00	36.00	96.00	120.00	144.00

IWAN'S SPLIT HANDLE POST HOLE DIGGER



FIG. 4529

Price per dozen.....	\$24.00
Price with 7-foot handles for telegraph poles	per dozen 36.00
Extra handles	per dozen pairs 3.00

Closed Open

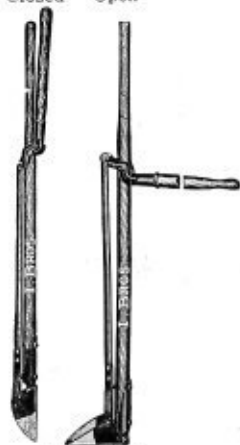


FIG. 4530

IWAN'S ONE BLADE POST HOLE
DIGGER

A digger which on account of its open construction is exceptionally well suited for digging in stony ground, and likewise in ground where all other closed diggers can be used.

Having but one blade, it can be forced deeper into the ground than two bladed diggers, and therefore loosens more soil with each plunge. The blade being wide and of large surface the digger can also be used as a shovel for replacing the earth in the post hole. For telephone and telegraph pole holes and for all post holes on the farm it is consequently a very economical and valuable tool.

Price	per dozen \$24.00
-------------	-------------------

LANSING NO. 5 "HALF-SACK" MIXER WITH STANDARD WHEEL BARROW HOPPER

A money maker for sidewalk construction, curbing, small foundations—in fact any job not requiring over 30 or 50 cubic yards per day. The cut shows regular equipment but can be furnished with all practical attachments as per specifications following.

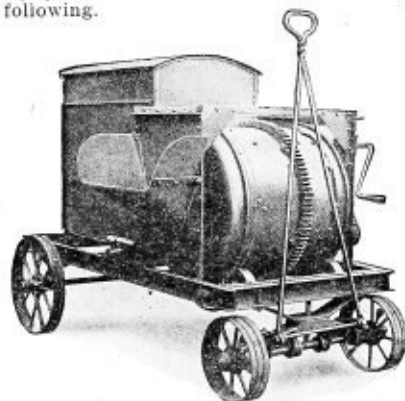


FIG. 4531

No. 5	Power 2½ H. P.
Regular	Gas. Engine
Capacity	Weight Lbs.
5 cu. feet per batch, unmixed.	2000
4 cu. feet per batch, mixed.	

EXTRAS

Power side loader (4 h. p. engine included.)
Batch measuring hopper.
Automatic water tank.
Loading platform.
Silo hoist.
Rotary pump.
Gravity discharge chute (8 feet.)
Magneto.
Team pole.
Higher wheels, wagon tread.
Equipped with electric motor when desired.

LANSING NO. 7 "ONE-BAG" MIXER WITH LOADER AND TANK

A popular size for the ordinary run of work. Mixes one sack of cement to a batch on any proportion up to 1 to 7. Its portability, strong steel construction and reliable power (and plenty of it) appeals to contractors who want an up-to-the-minute mixer. Just "making good" has sold 1500 No. 7 Lansings in the last three years.

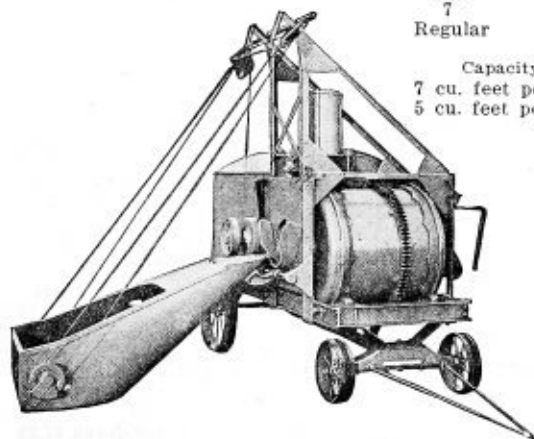


FIG. 4532

No. 7	Power 4 H. P.
Regular	Gas. Engine
Capacity	Weight Lbs.
7 cu. feet per batch, unmixed.	2800
5 cu. feet per batch, mixed.	

EXTRAS

Power side loader (5 h. p. engine included.)
Batch measuring hopper.
Automatic water tank.
Loading platform.
Rotary pump.
Gravity discharge chute (8 feet.)
Magneto.
Team pole.
Equipped with electric motor when desired.

PLASTERING TROWELS, NO. 2

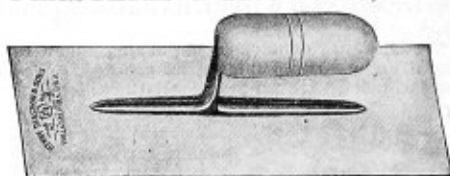


FIG. 4533

Length of Blade.....	inches 10 & 10½	11	11½	12
Width of Blade.....	inches 4½	4¾	4¾	4¾
Number of Rivets.....	3	3	4	4
No. 2	per dozen \$12.25	13.50	14.50	15.75

PLASTERERS' FINISHING TROWELS, NO. 118

LEATHER GRIP

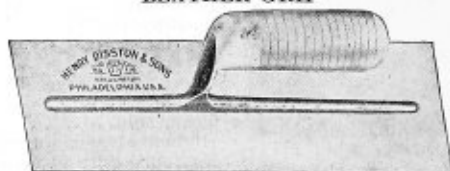


FIG. 4534

Size	inches	11	11½	12
No. 18. Polished Handle	per dozen	\$16.50	17.00	17.50
No. 19. Polished Handle with post.....	per dozen	17.50	18.00	18.50
No. 28. Polished Handle, extra thin blade, 24 gage.....	per dozen	16.50	17.00	17.50
No. 118. Leather Grip	per dozen	20.50	21.00	21.50
No. 119. Leather Grip, with post.....	per dozen	21.50	22.00	22.50
No. 123. Leather Grip, extra thin blade, 24 gage.....	per dozen	20.50	21.00	21.50

LONDON PATTERN BRICK TROWELS, NO. 5



FIG. 4535

Size inches	7½	8	8½	9	9½	10	10½
Per dozen	\$7.50	8.00	8.50	9.00	9.50	10.00	10.50
Size inches	11	11½	12	12½	13	13½	14
Per dozen	\$11.00	11.50	12.00	12.75	13.50	14.25	15.00

POINTING TROWELS, NO. 15

REGULAR, SOLID SHANK



FIG. 4536

Size, inches	4	4½	5	5½	6	7
Per dozen	\$4.25	4.50	4.75	5.00	5.25	5.75

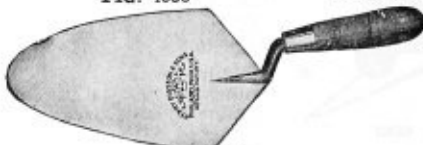


FIG. 4537

COKE TROWEL, NO. 80

Size 9 inch.....per dozen \$7.25

1 BE



FIG. 4538

5 E



FIG. 4539

10 E



FIG. 4540

18 E



FIG. 4541

CEMENT WORKERS' TOOLS

BEVEL EDGERS

No.	Length Inches	Width Inches	Radius Bevel Inches	Flat Edge Inches	Iron N. P. Each	Bronze Pol. Each
1BE	6	2 $\frac{3}{4}$	$\frac{1}{4}$	$\frac{5}{8}$	\$0.60	1.20
2BE	6	2 $\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	.60	1.20
3BE	9	2 $\frac{3}{4}$	$\frac{1}{4}$	$\frac{5}{8}$	1.00	2.00
4BE	9	2 $\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1.00	2.00

Above tools have both ends turned up.

EDGERS
Series No. 5 E

No.	Length Inches	Width Inches	Radius Inches	Turned Edge Inches	Iron N. P. Each	Bronze Pol. Each
5E	6	3	$\frac{3}{8}$	$\frac{5}{8}$	\$0.60	1.20
6E	6	3	$\frac{3}{4}$	$\frac{7}{8}$	.65	1.35
7E	9	3	$\frac{3}{4}$	$\frac{7}{8}$	1.00	2.00
8E	6	3	$\frac{3}{4}$	1	.65	1.30
9E	7	3	$\frac{3}{4}$	1 $\frac{1}{2}$	.75	1.50

Above tools have both ends turned up. 6E and 7E have outside curved edge flat. 8E and 9E outside curved edge rounded.

EDGERS
Series No. 10 E

No.	Length Inches	Width Inches	Radius Inches	Flat Face on Side Inches	Iron N. P. Each	Bronze Pol. Each
10E	6	1 $\frac{1}{2}$	$\frac{1}{4}$	$\frac{5}{8}$	\$0.60	1.20
11E	6	2 $\frac{3}{8}$	$\frac{1}{4}$	$\frac{7}{8}$	.60	1.20
12E	7	2 $\frac{1}{4}$	$\frac{3}{4}$	1	1.00	2.00
13E	8	2 $\frac{1}{2}$	$\frac{3}{8}$	..	.60	1.20

No. 10E—Both ends turned up and edge extending beyond each end $\frac{1}{2}$ inch.

No. 11E—One end turned up and the other end straight, $\frac{3}{4}$ -in. extension at each end.

No. 12E—Both ends turned up, $\frac{5}{8}$ -inch bevel extension on each end.

No. 13E—Outside edge is curved. Both ends straight. No extension on end.

STEP EDGERS, 1-SE

Step Edging Tool. 8 in. long, 2 $\frac{1}{4}$ in. sides. $\frac{3}{4}$ in. radius. Ends straight. For forming the edges of steps.

Price each, Iron, N. P. \$1.00

Price each, Bronze, Pol. 2.00

CEMENT WORKERS' TOOLS—CONTINUED



FIG. 4542



FIG. 4543

STEP NOSING TOOL, 1-SN

Step Nosing Tool. 6-inch long, top face 4-in. wide, curve for step edge $\frac{3}{4}$ -inch radius, bottom face $1\frac{1}{2}$ in. Used for moulding the projecting edges of steps.

Price each, Iron, N. P. \$1.50

Price each, Bronze Pol. 3.00

CURB EDGER

No.	Length Inches	Width Inches	Turned Edge Inches	Radius Inches	Iron N. P. Each	Bronze Pol. Each
1CE	7½	5½	2	1½	\$1.00	2.00
2CE	9½	5	2	1	2.00	4.00
3CE	8	6¼	2	2	2.00	4.00

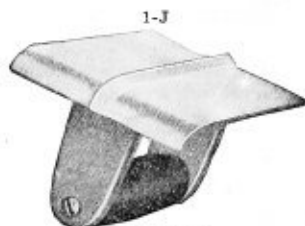


FIG. 4544

JOINTERS

No.	Length Inches	Width Inches	Depth Groove Inches	Width Groove Inches	Ends Turned Up	Iron N. P. Each	Bronze Pol. Each
1J	6	3	½	¼	1	\$0.60	1.20
2J	6	3	½	¾	1	.60	1.20
3J	6	3	½	¾	1	.65	1.30
4J	8½	3	½	¼	1	.90	1.80
5J	8½	3	¾	½	1	.90	1.80
6J	6	4¾	¾	¼	1	.75	1.50
7J	6	4¾	¾	½	1	.75	1.50
8J	6	3	½	¼	2	.60	1.20
9J	6	3	½	¾	2	.60	1.20
10J	6	3	½	½	2	.60	1.20
11J	8	3½	¾	¾	2	.90	1.80
12J	8½	3	½	¾	2	.90	1.80
13J	9	3	¾	¾	2	.90	1.80
14J	10	3	1½	¾	2	1.25	2.50
15J	9	3	½	½	2	1.00	2.00
16J	7½	1¾	¾	..	Str. Ends	.60	1.20
17J	10½	1¾	¼	..	Str. Ends	1.00	2.00

CEMENT WORKERS' TOOLS—CONTINUED

1-M J



FIG. 4545

METAL JOINTERS

No.	Length Inches	Width Inches	Cuts Groove		Iron N. P. Each	Bronze Pol. Each
			Depth Inches	Width Inches		
1MJ	3	2	$\frac{1}{8}$	$\frac{3}{8}$	\$0.60	1.20
2MJ	$4\frac{1}{4}$	$2\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{2}$	.60	1.20
3MJ	$4\frac{3}{4}$	2	$\frac{3}{8}$	$\frac{1}{4}$	.60	1.20
4MJ	$4\frac{1}{2}$	$2\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$	.60	1.20
5MJ	5	$2\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{4}$	.60	1.20
6MJ	$4\frac{3}{8}$	$2\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	.60	1.20
7MJ	$5\frac{3}{8}$	$2\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	.60	1.20

1-A



FIG. 4546

INSIDE CURVE AND ANGLE TOOLS

No.	Length Inches	Width Inches	Radius Inches	Corresponds to Outside Curve Tool No. Below	Iron N. P. Each	Bronze Pol. Each
1A	6	$1\frac{1}{2}$	...	1-OA	\$0.60	1.20
2A	8	$2\frac{1}{4}$	...	2-OA	1.00	2.00
3C	8	$2\frac{1}{4}$	$\frac{3}{4}$	3-OC	1.00	2.00
4C	8	$2\frac{1}{4}$	$1\frac{1}{2}$	4-OC	1.00	2.00
5C	8	$2\frac{1}{4}$	2	5-OC	1.00	2.00

Nos. 1A, 2A and 3C have sides at right angles.

1-OA



FIG. 4547

OUTSIDE CURVE AND ANGLE TOOLS

No.	Length Inches	Width Inches	Radius Inches	Corresponds to Inside Curve Tool No. Above	Iron N. P. Each	Bronze Pol. Each
1-OA	6	$1\frac{1}{2}$	...	1A	\$0.65	1.30
2-OA	8	$2\frac{1}{4}$	...	2A	1.00	2.00
3-OC	8	$2\frac{1}{4}$	$\frac{3}{4}$	3C	1.00	2.00
4-OC	8	$2\frac{1}{4}$	$1\frac{1}{2}$	4C	1.00	2.00
5-OC	8	$2\frac{1}{4}$	2	5C	1.00	2.00

ROLLERS

1-R

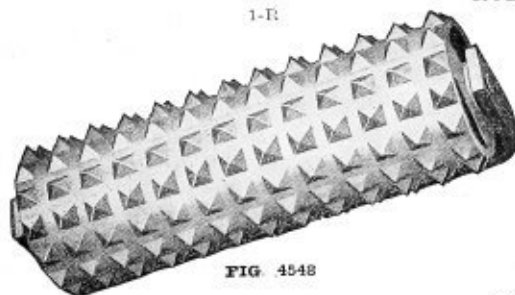


FIG. 4548

No. 1R. $9\frac{1}{4}$ in. long, $3\frac{3}{8}$ in. diameter. Size indentation $\frac{1}{8}$ in. square, $\frac{1}{4}$ in. deep. 13 stars to row. $\frac{1}{4}$ in. apart.

Price ea., Iron, N. P. \$7.00

Price, ea., Bronze Pol. 14.00

3-R



FIG. 4549

No. 3R. $9\frac{1}{4}$ in. long, $3\frac{3}{8}$ in. diameter. Depth grooves $\frac{1}{4}$ in. Between grooves $\frac{3}{8}$ in. 24 grooves.

Price each, Iron, N. P. \$6.00

Price each, Bronze Pol. 12.00

ASPHALT PAVING TOOLS

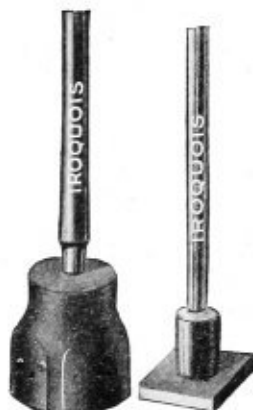


FIG. 4550

FIG. 4551

ASPHALT TAMPERS

Are built to withstand hard service and to hold heat. The foot is cast on to a steel stub which is welded to a steel pipe handle. Bottom of foot is ground smooth. Size 8x6 in. usually sent unless otherwise specified.

CONCRETE TAMPERS

Are made of an oak block 8 in. square by 6 in. high, with a wood handle driven in secured by bolts. Length over all, including block, 4 ft.

No. 2209.	Concrete Tamper, (standard) weight 10 lbs.	Price each	\$2.00
No. 2210.	Asphalt Tamper (standard) 8x6 in., weight 35 lbs.	Price each	4.05
No. 2211.	Asphalt Tamper, 8x8 inches, weight 37 lbs.	Price each	4.20
No. 2212.	Asphalt Tamper, 6x6 inches, weight 29 lbs.	Price each	3.50
No. 2213.	Asphalt Tamper, 5½x2½ inches, wt. 16 lbs.	Price each	2.05

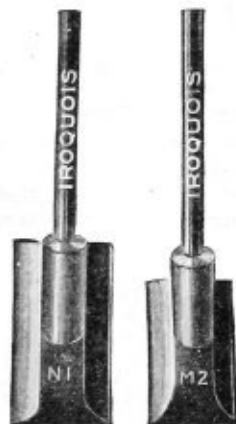


FIG. 4552

FIG. 4553

ASPHALT SMOOTHERS

Used for smoothing patches and joints in asphalt pavements, also on small areas where a steam roller would be impracticable.

Are made in two sizes, the face ground smooth and to a curve. Especially designed to stand up under high temperatures and hold heat. The foot is cast on to a steel stub, which is welded to a 1¼ in. steel pipe handle, bent at end.

Where size is not specified, the 10½ in. x 6½ in. Smoother will be shipped.

No. 2207.	Smoother, 14½x7½ in. weight 67 lbs.	Price each	\$7.05
No. 2208.	Smoother, 10½x6½ in., weight 46 lbs.	Price each	5.20

ASPHALT PAVING TOOLS—CONTINUED

ASPHALT SANDALS



FIG. 4555



FIG. 4556

These Sandals prevent tracking of the soft pavement with workmen's shoes.

Made of double ply, extra heavy canvas, soaked in mud-red paint. Approximately $\frac{1}{2}$ inch thick by 14 in. long and 7 in. wide. Metal heel plates are securely riveted to sole and leather straps of best quality with buckles are provided.

No. 2200. Weight per dozen 42 lbs.

Priceper pair \$1.85

ASPHALT CUTTERS



FIG. 4557

Used for cutting out old asphalt pavements for patch work. Length of cutter edge to edge $20\frac{1}{2}$ in., width of edges, 3 in.

No. 2206. Weight each 10 lbs.

Priceeach \$1.80

Handles not included.

PATCHING HOES



FIG. 4558

When patching or resurfacing asphalt pavements, this hoe is used for scraping off the old surface, while it is hot, after the surface heater has been applied. The pointed side is used for cleaning out joints or cracks in the pavement before the new material is laid.

The blade is made of No. 10 steel; 10 in. wide and 8 in. high, with stamped teeth on one edge, 1 in. pitch by 1 in. deep. The other side is pointed. The handle is 7 ft. 10 in. long, made of $\frac{3}{4}$ in. steel pipe, welded to a steel crow foot which is strongly riveted to the head.

No. 2215. Weight 11 lbs. Price each \$2.50

ASPHALT AND TAR DIPPERS



FIG. 4559

Built of No. 24 galvanized iron or tinned plate with heavy wire band at top.

No. 2204. Cap. 9-qt., handle 3 ft.

long, weight 9 lbs. Price each \$3.65

No. 2205. Cap. 6-qt., handle 6 ft.

long, weight 7 lbs. Price each 3.45

OLD MATERIAL PANS



FIG. 4560

For reheating old asphalt and some new material added for patching purposes. Length, inside 10 ft., 4 ft. 2 in. wide and 13 in. deep.

No. 2231. Weight 710 lbs.

Price upon application.

ASPHALT PAVING TOOLS—CONTINUED



FIG. 4561

MELTING POTS

Used for heating a small quantity of asphalt cement over the fire wagon when painting joints in patch work, or for carrying asphalt from kettle to the men using the pouring pots in penetration paving. Substantially constructed.

No. 2201. Cap. 7 gallons, weight 8 lbs. Price each \$5.75

HAND POURING POTS

For Oils, Asphalt, Tarvia and all other Bituminous Material.

This pot has a capacity of four gallons, is oblong in shape, made of heavy sheet iron; all seams are oxy-acetylene welded.

The spreader is made in two sizes, 8 inches and 10 inches wide, and is integral with the body of the pot, which leaves no part loose to annoy the user or to be lost when not in use. The device for adjusting this spreader is very simple, consisting of two thumb screws, one on either side, which when loosened allows the slot to be made larger or smaller, thereby enabling the user to pour the specified amount to the square yard of surface.

A hood covers one-half of the top opening, which prevents stopping the oil and protects the operator from burns.

The handles are constructed with pressed bosses permitting the use of the pot without cutting the hands.

A basket screen of fine galvanized wire cloth is fitted in the top through which all the oil is strained, when filling, thereby keeping out all foreign substances that might clog the spreader. The screen can be removed and cleaned without delay or the use of any tools. A great many contractors are using this pot for spreading roof pitch, also for waterproofing concrete work.

No. 2202A. Cap. 4-gallon, 8-inch spout, weight 7 lbs. . Price each \$4.50

No. 2202B. Cap. 4-gallon, 10-inch spout, weight 7 lbs. . Price each 5.00

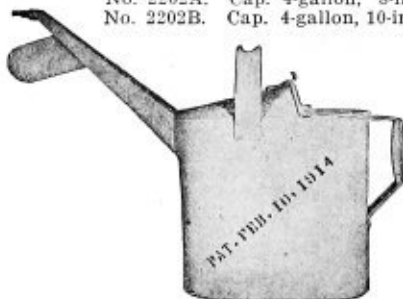


FIG. 4563

BRICK FILLING POT

Designed for filling joints in brick pavements and cracks in concrete pavements with pitch or asphalt of any description. It is oval in shape, has a capacity of 4 gallons, is made of heavy sheet iron, all joints and seams welded by the oxy-acetylene process, making it one piece and doing away with any possibility of leaks; provided with a fine mesh removable screen. The spout is fitted with two pipe nipples, which screw into each other, giving three sizes of outlets.

No. 2202C. Cap. 4-gallon, weight 7 lbs. Price each \$5.00

HAND ROLLER

Standard weight 1,000 lbs.

No. 2232 Price on request



FIG. 4564



FIG. 4565

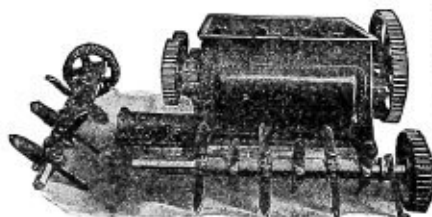


FIG. 4566

on the nature of the mixture and are made of cast iron, cast steel, manganese steel, or combination blades having cast iron or cast steel shanks with manganese steel tips bolted on. These mixers are furnished in the following sizes: 5 cu. ft., 7 cu. ft., 9 cu. ft., 12 cu. ft., 15 cu. ft., 18 cu. ft., 40 cu. ft.

Approximate shipping weight of 9 cu. ft. mixer.....4,200 lbs.

Approximate shipping weight of 15 cu. ft. mixer.....8,900 lbs.

Prices on application.

STATIONARY ROOFERS' KETTLES

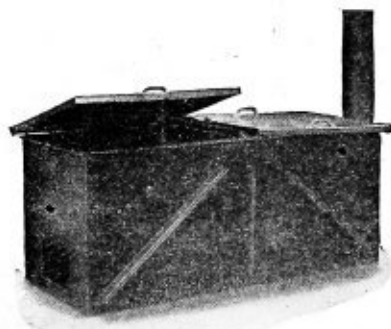


FIG. 4567

ASPHALT PAVING TOOLS

— CONTINUED

STREET SCRAPERS

Adapted for cleaning streets, sidewalks, bridges, floors, etc. They wear off to a sharp edge, which does not curl up as on most scrapers.

Made of sheet steel, 30 in. long by 13 in. wide, with flanged ends and back; securely bolted and braced to a substantial wooden handle.

No. 2203. Weight 10 lbs. Price each \$1.95

ASPHALT MIXERS

A two-shaft mixer of the pugmill type has been adopted as standard equipment by some of the largest manufacturers of stationary, portable and railroad asphalt plants. The shell is constructed of heavy steel plates with removable liners and the end housings of cast iron, furnished with or without steam jackets and with either hand lever or steam cylinder for operating dumping gate. The shafts are provided with removable blades for mixing the materials. The number and shape of blade depends

These kettles are made in 50, 100 and 150-gallons capacities; substantially built of sheet steel, with sides braced with angle iron. They are thoroughly riveted and flanged at all corners. The tanks are made with semi-cylindrical bottoms and are removable for repairs and replacement. Two lids are furnished with handles. Thickness of furnace plates No. 14 gage, thickness of tank plates No. 10 gage.

50-gallon, height 27½ in., length 51 in., width 25½ in., shipping weight 310 lbs.....Price on request

100-gallon, height 33½ in., length 52½ in., width 32½ in., shipping weight 405 lbs.....Price on request

150-gallon, height 33½ in., length 77 in., width 32½ in., shipping weight 585 lbs.....Price on request

ASPHALT PAVING TOOLS—CONTINUED

PORTABLE ROOFERS' AND PAVERS' KETTLES

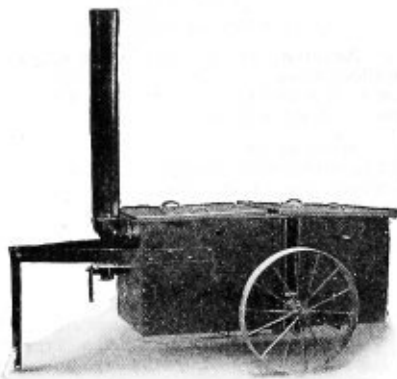


FIG. 4568

These kettles are especially designed for the paving and roofing contractors; substantially built of heavy steel plates, thoroughly riveted and flanged at all corners. Tanks are made with semi-cylindrical bottoms and are removable for repairs and replacement. Excepting the 50-gal., the furnace is equipped with grates for burning coal or wood, and provided with a dead air space between the furnace and side walls. Removable lids with handles provided on top. Steel wheels are furnished; 36-in. diameter with 4-in. rims. Also tongue with steel handle and rest. The Iroquois Patented Submerged Type Valve is installed inside the tank; thus avoiding all clogging at the draw-off.

- 50-gallon, height 27½ in., length 51 in., width 25½ in., shipping weight 740 lbs.
Price on request.
- 100-gallon, height 33½ in., length 52¼ in., width 32¼ in., shipping weight 1,145 lbs.
Price on request.
- 150-gallon, height 33½ in., length 77 in., width 32¼ in., shipping weight 1,302 lbs.
Price on request.

FIRE WAGON



FIG. 4569

This wagon is designed for heating asphalt tools and is thoroughly and well made of very best materials. The body is built of 12-inch standard steel channels with 3-inch flanges at top and bottom. The sides are perforated to radiate heat and prevent warping. A sloping ash pan is provided to facilitate cleaning. Removable cast iron grates are arranged in sections and can be readily replaced. Uprights with crossbar and hooks are provided for holding melting pots. The body is supported on heavy axles and metal wheels. General dimensions are as follows:

Length of body.....	5 ft. 0 in.
Width of body.....	2 ft. 6 in.
Depth of body.....	1 ft. 0 in.
Shipping weight.....	1,318 lbs.
Price.....	on request

ASPHALT PAVING TOOLS—CONTINUED

CONTINUOUS HEATING KETTLES

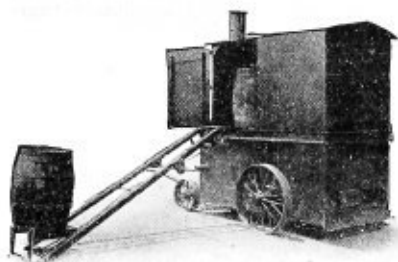


FIG. 4570

the tank and a clean tank is assured.

These kettles are especially designed for the road contractor, who considers quality before first cost and wants a kettle that will last a life time—not the flimsy contrivance usually sold for this class of work.

It is wide, low and get-at-able with the furnace sheets reinforced to prevent buckling and dead air space between side walls and furnace to prevent radiation of heat. The tank is removable to facilitate repairs and cleaning. The fire box is provided with cast iron grates for burning either coal or wood. The Iroquois Patented Submerged Type Valve is installed inside the tank; thus annoyance and delay are avoided, caused by clogging of the ordinary draw-off pipe and exposed plug cock. A draw-off is provided on each side of the kettle.

A substantial metal skid with windlass is furnished with each kettle for elevating the barrels from the ground to the rack. Heavy steel plate is used throughout, together with substantial metal wheels with wide rims.

No. 2227. 400-gallon, height 40 in., length 96½ in., width 57 in., shipping weight 4,800 lbs. Price on request

SURFACE HEATERS



FIG. 4571

Originally designed for heating old sheet asphalt pavements to soften the surface when patching or resurfacing a street. They are now used extensively for many kinds of surface heating and drying purposes, where a portable dryer is adapted to the work. A number of base ball teams are using Iroquois Surface Heaters for drying their ball diamonds after a rain.

Frames are of 3 in. channels supported on a steel axle.

Wheels of metal, 36 in. diameter. Fuel tank is galvanized and holds 17½ gallons; provided with a suitable air hand pump, pressure gage, necessary piping, valves and funnel for filling. A weight to counter-balance the weight of hood and burners is provided on extended handle. Hood is of sheet steel properly braced and supported to withstand heat. Burns either gasoline, kerosene or a mixture of both.

Heaters with different size hoods are furnished. The heater with 4 ft. x 5 ft. hood is carried in stock and always shipped, unless other size is specified.

No. 2226. Weight 615 lbs. Price on request

GIFFORD-WOOD'S ICE TOOLS

Wood's Ice Tools are the very best manufactured. They are the best models which experience can produce, made of high grade steel and absolutely guaranteed.



FIG. 4572

SOLID HANDLE ICE TONGS

No. 540 Boston Tongs, 13 -inch.....	per dozen, \$20.50
No. 540 Boston Tongs, 14½-inch.....	per dozen, 21.00
No. 540 Boston Tongs, 16½-inch.....	per dozen, 21.75
No. 540 Boston Tongs, 24 -inch.....	per dozen, 24.00



FIG. 4573

HOLLOW HANDLE ICE TONGS

This pattern catches the ice low on the sides, and having short shanks, raises the cake clear from the ground, bringing the weight close to the hand. On this account the shape is gradually superseding other patterns.

No. 542 Boston Tongs, 13 -inch.....	per dozen, \$22.00
No. 542 Boston Tongs, 14½-inch.....	per dozen, 22.50



FIG. 4574

PATENT LINK ICE TONGS

Patent Link Tongs have single links that are positive in action and do not bind as in the case of some of the Chain Tongs.

Simply pressing against the handle opens up the tongs. The hang of this pattern suits the ice man exactly. They are superseding other tongs in this section.

No. 551 Link Tongs, 12-inch.....	per dozen, \$18.50
No. 551 Link Tongs, 15-inch.....	per dozen, 19.00



FIG. 4575

ICE HATCHETS

No. 620 Medium Southern Hatchet....	per dozen, \$26.00
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ICE SPLITTING CHISEL



FIG. 4576

Used to split off single cakes either in the canal or on the platform. Handy for general use, with a blade of uniform taper on both sides. Weight, 14 pounds; length, 4 feet 6 inches; blade, $10\frac{1}{2} \times 3$ in.

No. 476.—Splitting Chisels, Ring Handle, steeled blade.....each, \$4.50

No. 477.—Splitting Chisels, Ring Handle, all tool steel blade (marked "Extra")each, 4.75

CAR ICING HOOK

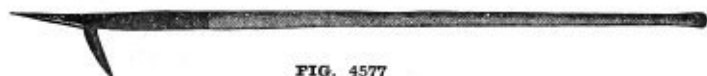


FIG. 4577

No. 524½—Icing Hooks, wood handles, 5 feet over all.....per dozen, \$40.00

No. 524¼—Icing Hooks, wood handles, 5½ feet over all.....per dozen, 40.50

No. 524C—Icing Hooks, pipe handles, 5 feet over all.....per dozen, 43.00

No. 524D—Icing Hooks, pipe handles, 5½ feet over all.....per dozen, 43.00

LITTLE GIANT ICE CRUSHERS

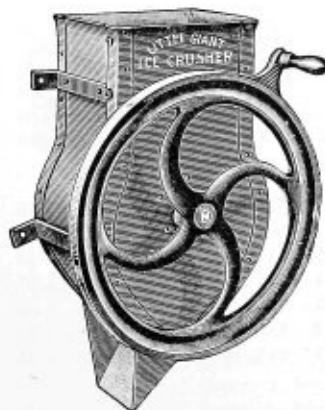


FIG. 4578

NO. 1 FOR ICE WAGON USE

This machine is the greatest time and labor saving device for ice wagon use that has ever been invented. With it as much can be done in one minute as by hand in fifteen to twenty. It receives a cake of ice $8\frac{1}{2}$ in. x 12 in. of any length. Broken pieces, or crippled ice, crush up as well as large pieces. This is a saving in ice, as broken pieces are usually wasted. It crushes the ice uniform and to the proper size. The frame being made of boiler steel, breakage is impossible. They will last a lifetime.

Weight complete, 120 pounds. Price...\$49.00



FIG. 4579

DIXON'S LUMBER CRAYONS

1-2 X 4 1-2 INCH

No. 361.	Black, regular grade	per gross	\$ 6.00
No. 362.	Black, hard grade	per gross	6.00
No. 365.	Black, soft grade, for green lumber	per gross	6.00
No. 520.	Red	per gross	10.80
No. 521.	Blue	per gross	9.00
No. 522.	Green	per gross	10.80
No. 496.	Yellow	per gross	10.80

Nos. 361-520 and 521 most popular—one dozen in a box.

"BESTOVALL" LUMBER CRAYON 5 3-4 X 1 1-2 INCH



FIG. 4580

No. 425.	Blue	per gross	\$6.00
No. 430.	Black-Graphite	per gross	6.00
No. 435.	Red	per gross	6.00
No. 436.	Indian Red	per gross	6.00
No. 440.	Green	per gross	6.00
No. 450.	Yellow	per gross	6.00

KORN'S MARKING CRAYONS

For marking hot ingots, plates, slabs, castings, etc.



FIG. 4581

No. 15.	White	per gross	\$7.00
No. 20.	Yellow	per gross	7.00
No. 25.	Red	per gross	7.00
No. 30.	Blue	per gross	8.00
No. 35.	Green	per gross	8.00

Length of crayon, 4 3/4 inches. Packed one dozen in box.

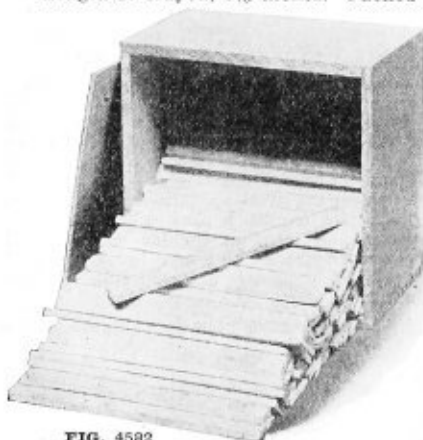


FIG. 4582

METAL WORKERS' CRAYONS

Our talc metal workers' crayon is cut from the best grade of North Carolina soapstone obtainable.

No. 1.	5x 1 1/2 x 3/8	per gross	\$2.50
No. 2.	5x 1 1/2 x 1/4	per gross	2.75
No. 3.	5x 1 1/4 x 3/8	per gross	3.25
No. 4.	5x 1 1/4 x 1/4	per gross	3.35
No. 5.	5x 1 1/2 x 1/2	per gross	3.35
No. 6.	5x 1 1/4 x 1/4	per gross	2.10
No. 7.	5x 1/4 round	per gross	3.25

CRAYONS AND CARPENTERS' CHALK, ETC.



FIG. 4583

CARPENTERS' CHALK

Made in hemisphere cakes, 25 gross in case.

No.	777	777	777
Colors	White	Red	Blue
Per gross	\$.....		

LUMP CHALK

Priceper pound \$0.10



FIG. 4586

WHITE COTTON BRAIDED CHALK LINES

Nos. 0, 1, 2, 3—
 20 foot hanks, $\frac{1}{2}$ gross in box.
 50 foot hanks, $\frac{1}{2}$ gross in box.
 50 foot balls, 1 dozen in box.
 100 foot balls, 1 dozen in box.

RAILROAD CRAYONS

Four inches long, 1 inch diameter and enameled on outside, making them clean to handle. One gross in box, 5 boxes crated together.

No.	888	888
Colors	White	Red
Per gross	\$.....	
No.	888	888
Colors	Blue	Green
Per gross	\$.....	

School Crayons



FIG. 4584

SCHOOL CRAYONS

Waltham White, 1 gross in box, 100 boxes in caseper gross \$....
 Waltham Yellow Enamel, 1 gross in box, 100 boxes in case.....per gross \$....

Carpenters' Chalk



FIG. 4585

WHITE COTTON TWISTED CHALK LINES

In 50 and 100 foot balls. One dozen in a box.

Nos.	1	2	3	4	5	6	7	8	9
Threads	9	12	15	18	21	24	27	30	36

Also may be furnished in 20 and 50 foot hanks.



FIG. 4587

CORDAGE

HOW ROPE IS MADE

The raw material which forms the basis for cordage comes from some of the most picturesque corners of the world.

The Philippine Islands produce Manila Hemp, which experience has shown to be the most durable fibre for use in the construction of good rope. In the province of Yucatan, Mexico, sisal fibre, most largely used for binder twine, but also a factor in the rope industry, is produced in large quantities. China, India, Africa, Italy, Australia and many other foreign lands offer, to the cordage manufacturer, usable material of varying character.

Let us here sketch briefly the method employed in the manufacture of Manila Rope.

Manila Hemp is taken from the Abaca plant, or tree, which is found only in the Philippine Islands. Abaca plants grow to a height of eight to twenty feet, the trunks being composed chiefly of overlapping leaf sheaths. These leaf sheaths, when they are mature, are stripped off and split into strips which are drawn, usually by women workers, by hand under a knife held by a spring

to a piece of wood. Thus the pulp is scraped away leaving hemp fibres (similar to the tough cords of a celery stock) which are, in the better grades, from six to twelve feet in length and very strong. After drying in the sun, the fibre is taken to the principal towns where government agents inspect it and grade it for quality. It is then baled as shown here—270 pounds to the bale—for export.

Bale of hemp as it is shipped, and "hand" of fibre over ten feet long.



FIG. 4594

The manufacturer, in order to turn the hemp into rope, is compelled to put it through many processes. After the bales are opened and inspected, the fibre passes over a number of machines, each one performing its part in the operations of combing, cleaning and drawing, the object being to thoroughly clean and straighten the hemp

CORDAGE—CONTINUED

and get it ready for the spinning machine or jenny which changes it from what is known as sliver or roping into yarn.

The yarn goes from the jenny or spinner to the machine which forms the strand that eventually becomes a portion of the finished rope. The strands are placed upon the rope layer which completes the work, and the product is then ready for the packing department which prepares it for shipment.

From the opening up of the baled hemp until the complete packages are ready to be warehoused, or shipped, there is constant and careful supervision throughout each and every process.

"BESTOVALL" Rope, as offered to buyers, confirms the results which such care and inspection are expected to deliver.

A Preparation Room



FIG. 4595

Jenny Room

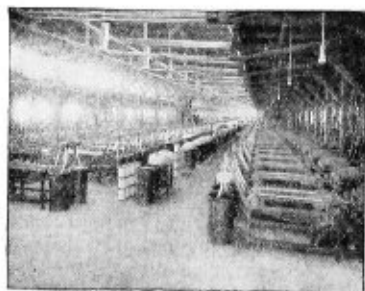


FIG. 4596

In the Rope Laying Room

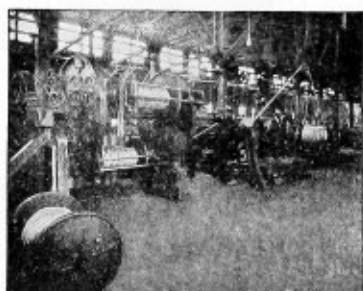


FIG. 4597

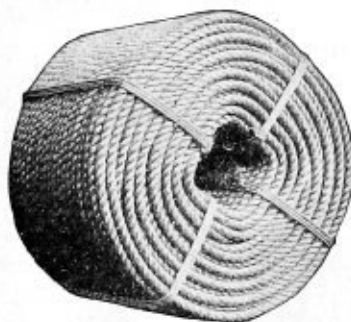


FIG. 4598

APPROXIMATE WEIGHTS AND STRENGTH OF CORDAGE

Circumference Inches	Diameter Inches	Coils, 1,200 feet. Half Coils, 600 feet.		Feet Per Pound Feet	Breaking Strain Pounds
		Weight Per Coil Pounds	Weight Per Half Coil Pounds		
$\frac{3}{8}$	$\frac{1}{8}$	30	15	60	460
$\frac{1}{2}$	$\frac{1}{4}$	35	18	50	550
$\frac{3}{4}$	$\frac{1}{2}$	45	23	40	620
1	$\frac{3}{8}$	50	25	30	1,000
$1\frac{1}{8}$	$\frac{1}{2}$	55	28	24	1,275
$1\frac{1}{4}$	$\frac{5}{16}$	65	33	20	1,875
$1\frac{1}{2}$	$\frac{3}{4}$	85	43	14	2,400
$1\frac{3}{4}$	$\frac{7}{16}$	120	60	10	3,300
2	$\frac{1}{2}$	160	80	$7\frac{1}{2}$	4,000
$2\frac{1}{4}$	$\frac{3}{4}$	200	100	6	4,700
$2\frac{1}{2}$	$\frac{11}{16}$	240	120	5	5,600
$2\frac{3}{4}$	$\frac{1}{2}$	300	150	4	6,500
3	1	350	175	$3\frac{1}{2}$	7,500
$3\frac{1}{4}$	$1\frac{1}{16}$	420	210	$2\frac{7}{8}$	8,900
$3\frac{1}{2}$	$1\frac{1}{8}$	480	240	$2\frac{1}{2}$	10,500
$3\frac{3}{4}$	$1\frac{1}{4}$	560	280	$2\frac{1}{8}$	12,500
4	$1\frac{1}{8}$	640	320	$1\frac{9}{10}$	14,000
$4\frac{1}{4}$	$1\frac{3}{8}$	720	360	$1\frac{3}{8}$	15,400
$4\frac{1}{2}$	$1\frac{1}{2}$	800	400	$1\frac{1}{2}$	16,200
$4\frac{3}{4}$	$1\frac{5}{8}$	900	450	$1\frac{1}{4}$	17,000
5	1 $\frac{3}{4}$	1,000	500	$1\frac{1}{8}$	20,000
$5\frac{1}{2}$	1 $\frac{7}{8}$	1,200	600	1	25,000
6	1 $\frac{1}{2}$	1,440	720	10	27,500
$6\frac{1}{4}$	2	1,550	775	$9\frac{3}{10}$	30,000
$6\frac{1}{2}$	$2\frac{1}{8}$	1,675	840	$8\frac{3}{8}$	33,000
7	$2\frac{1}{4}$	1,950	975	$7\frac{1}{2}$	37,000
$7\frac{1}{2}$	$2\frac{3}{8}$	2,240	1,120	$6\frac{1}{2}$	43,000
8	$2\frac{1}{2}$	2,540	1,270	$5\frac{3}{8}$	50,000
$8\frac{1}{2}$	$2\frac{3}{4}$	2,880	1,440	5	56,000
9	$2\frac{7}{8}$	3,200	1,600	$4\frac{1}{2}$	62,000
$9\frac{1}{2}$	3	3,600	1,800	4	68,000
10	$3\frac{1}{8}$	4,000	2,000	$3\frac{3}{8}$	75,000
11	$3\frac{1}{2}$	4,890	2,445	.....	.....
12	$3\frac{3}{4}$	5,700	2,850	.....	.....
14	$4\frac{1}{2}$	7,890	3,945	.....	.....
16	5	10,440	5,220	.....	.....
18	$5\frac{3}{4}$	13,620	6,810	.....	.....

Manila is about 25 per cent stronger than Sisal.

MANILA ROPE

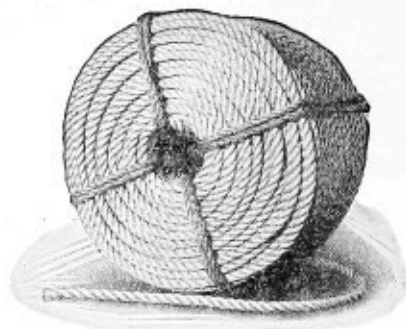


FIG. 4599

OUR BRANDS:

"BESTOVALL" MANILA ROPE

Made from the best selection long fibre Manila Hemp—three strand—in all diameters, $\frac{3}{8}$ inch to 3 inches inclusive. In four strand or shroud lay, in all diameters up to 2 inches. Four strand furnished with or without core. Also in Hawser Laid.

Our "BESTOVALL" Brand of rope contains a small blue strand as a mark of quality. The best is the cheapest in the end. Insist on rope showing this trade mark.

"FORT PITT" MANILA ROPE

Is a second quality pure Manila Rope, but of shorter fibre than our "BESTOVALL" Brand. Recommended only in diameters $\frac{3}{8}$ inch to 2 inches inclusive, and in three strand or in four strand. "FORT PITT" Manila is as good value as some so-called first grades on the market.

"MONARCH" SISAL ROPE

Only pure Sisal Fibre employed in its construction. Manufactured in diameters $\frac{3}{8}$ inch to $1\frac{1}{2}$ inches inclusive. Can be had for hay carrier purposes in either three or four strand. Also in Hay Rope, Ballings, Hide Rope and Tarred and Untarred Lath Yarn.

DESCRIPTIONS AND CLASSIFICATIONS OF ROPE

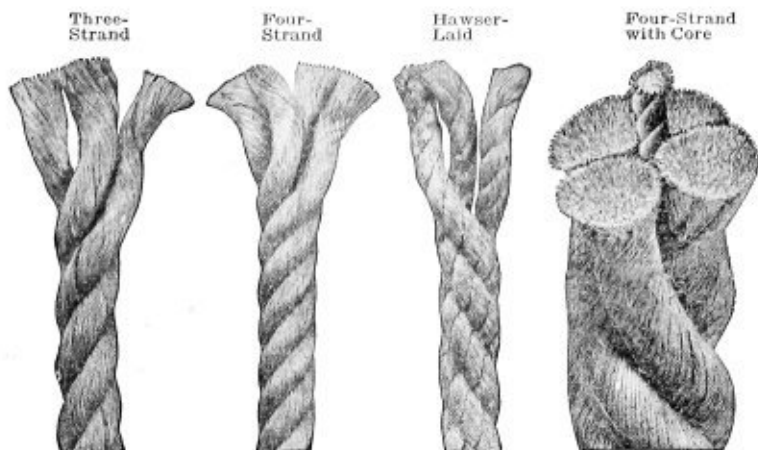


FIG. 4600

EXPLANATION

Yarn. This is the term applied to the product of the first process after the fibre has been prepared for spinning and has passed through the spinning machine.

Strand. This is the term employed to describe a number of yarns twisted together in order to form one of the component parts of a finished rope.

PLAIN LAID ROPE is made by laying together three strands. It can be supplied in either right or left lay.

FOUR STRAND ROPE, SOMETIMES KNOWN AS SHROUD LAID, composed of four strands instead of three, and as a general thing is constructed with a core running throughout the center. Can be furnished without core if preferred.

HAY CARRIER ROPE. Furnished in plain laid rope or in four strand with or without core. Can be offered in all grades of Manila and in "MONARCH" Brand Sisal in any required diameter.

TENT AND AWNING ROPE. This is of loose or soft lay such as is best suited to tents and also to the demands of awning manufacturers. It is offered in Sisal and Manila in any grade; is usually preferred free from oil. All staple sizes.

TRANSMISSION ROPE. As its name implies, this rope is, for many power drives, considered even more satisfactory than belting of any description. It is made from a quality of Manila hemp peculiarly suited to such work and in its construction provision is made for lubrication in order to reduce operating friction to the minimum. Available in three strand or in four strand. One brand only, our "BESTOVALL." In all staple sizes.

DESCRIPTION AND CLASSIFICATION OF ROPE— CONTINUED

HAWSER LAID ROPE. As now understood in the trade, this construction is due to a manufacturing process which lays together three individual plain laid ropes. There are nine strands in a Hawser. Formerly an ordinary plain laid rope in large diameter was known as a Hawser, but in recent years the term has been synonymous with cable lay. Made in diameters $\frac{5}{8}$ inch to 3 inches inclusive, in "BESTOVALL" grade only.

DRILLING CABLE AND CRACKER. These are of similar construction with Hawser laid rope as now understood. If anything the lay is even harder. Cordage of this particular description, as in the case of bolt rope and transmission rope, calls for the employment of selected Manila Fibre possessing peculiarly suitable qualifications. Drilling cables as a general thing are in demand in oil and gas fields and to a limited extent in locating water. The term "cracker" describes a short drilling cable containing only a few hundred feet and usually employed in finishing wells. Offered in "BESTOVALL" grade in any diameter up to $2\frac{1}{2}$ inches.

HAY ROPE AND BALING. Cordage of this description is offered in any grade of Manila and Sisal. When wanted heavier than one-ply, the construction is simply the formation of whatever number of single yarns may be wanted into a twisted strand of the character required in the construction of rope. When put up two-ply, it is usually termed hay rope. In any other ply than two-ply it is usually known as baling. Can be furnished laid if so ordered. The laying process, in joining individual yarns, locks the yarns together in the strand, making it more difficult to separate them than is the case with formed twines. Furnished unoiled if wanted; put up on reels, in coils or in balls.

HIDE ROPE is of the same type of construction as hay rope and baling, except that it is not so described when put up one-ply. For the convenience of users the hay rope or baling is twisted into a larger strand in what is known as rope form, said strand containing many ends which enables those who use the twine to make one cut of any required length and by that process have at hand a certain known number of lengths of the same measurement. Furnished unoiled if wanted, and usually in coils.

UNTARRED LATH YARN OR RING YARN. A single yarn usually put up in many ends for the convenience of users. When wound single end or one-ply it is properly described as baling. Is in demand by lumber manufacturers, but also serves many other purposes. Can be furnished single end, and on reels, in coils or in balls. When stranded many ends, it is usually put up in coils.

TARRED LATH YARN is put up in like manner with untarred lath yarn or ring yarn. The application of tar is mainly intended to preserve the life of the twine exposed to the weather, but it also helps to prevent slipping of knots. Packed in the same manner as untarred lath yarn or ring yarn.

ROPE DIFFERENTIAL

Owing to frequent fluctuations in costs of fibres which necessarily change the prices of all grades of rope, no fixed prices can be quoted. Each grade, therefore, has a basis price upon which the prices of all sizes are figured, as shown in this differential. Base prices quoted on application.

MANILA AND SISAL ROPE

$\frac{3}{4}$ inch and over.....	BASIS
$\frac{5}{8}$ inch diameter.....	$\frac{1}{2}$ cent above basis
$\frac{9}{16}$, $\frac{1}{2}$, $\frac{5}{8}$ inch diameter.....	1 cent above basis
$\frac{3}{4}$ inch diameter.....	$1\frac{1}{2}$ cents above basis
$\frac{7}{8}$, $\frac{1}{4}$ inch diameter.....	2 cents above basis
$\frac{1}{2}$ inch diameter.....	$2\frac{1}{2}$ cents above basis
Transmission Rope	Special
Bolt Rope	Special
Hawser Laid Rope.....	Special
Four Strand, with or without core.....	1 cent above basis
Lariat Rope, three strand.....	4 cents extra
Lariat Rope, four strand.....	5 cents extra
Tarred, Tallow Laid or Plumbago Rope.....	Basis
Balling	$\frac{1}{4}$ cent extra

HIDE ROPE, HAY ROPE AND BALING

Medium and Coarse.....	$\frac{1}{2}$ cent above basis
Fine	1 cent above basis
Extra Fine	$1\frac{1}{2}$ cents above basis
Laid	$\frac{1}{2}$ cent extra

UNTARRED LATH YARN OR RING YARN

Medium or Coarse.....	BASIS
Fine	$\frac{1}{2}$ cent above basis

Uncoiled Twines and Rope, 1c extra

TARRED LATH YARN

Medium or Coarse.....	BASIS
Fine	$\frac{1}{2}$ cent above basis

TARRED FODDER YARN

Medium or Coarse.....	} Prices on application
Fine	
16 oz., 18 oz., 21 oz., 24 oz., 27 oz., 30 oz. and 32 oz.....	

HOW TO DETERMINE THE SIZES OF TWINES

These sizes are standard among all manufacturers of twines. Comparison of any ball twine with this chart will enable you to determine exactly its number. Nos. 12 to 60, inclusive, are fine finished; Nos. $4\frac{1}{2}$ to 9, inclusive, are coarse finished twines. A coarse twine No. 10 is seldom made, but can be furnished, if desired.



FIG. 4601

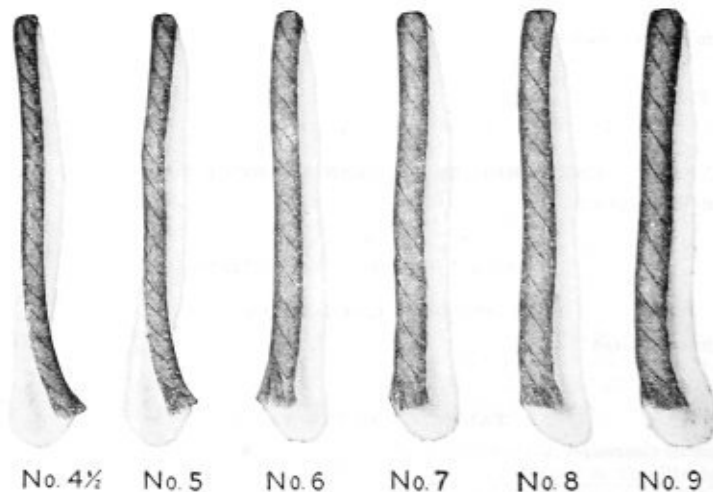


FIG. 4602

TWINES CLASSIFIED AND DESCRIBED

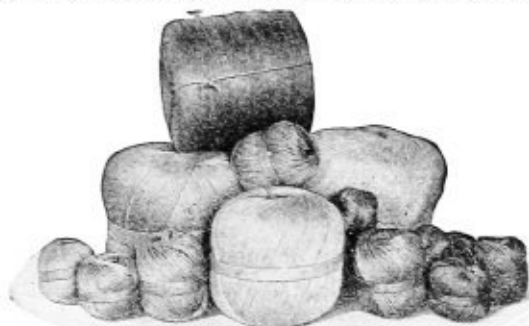


FIG. 4603

FINE FINISHED HEMP AND INDIA TWINES

Are fine spun, smooth finished or polished twines, made in Nos. 12, 18, 24, 36, 48 and 60 sizes in BC grade.

BC is mixed hemp and jute.

Regular Packings.

- $\frac{1}{2}$ lb. balls in 3-lb. packages and 168-lb. bales.
- $\frac{1}{2}$ lb. balls in bulk in barrels.
- 100-lb. coils stranded many ends.
- 10 lb. to 100 lb. reels—single end.
- 10 lb. to 35 lb. universal wound tubes.

COARSE FINISHED HEMP AND INDIA TWINES

Are made from heavy or coarse spun yarns, well polished, smooth and even, in sizes Nos. 4 $\frac{1}{2}$, 5, 6, 7, 8, 9 and 10 in BC grade.

BC grade is a mixture of hemp and jute.

Regular Packings.

- No. 4 $\frac{1}{2}$ — $\frac{1}{2}$ -lb. balls, in 500-lb. bales; larger balls, if wanted.
- No. 5 — $\frac{3}{4}$ -lb. balls, in 500-lb. bales; larger balls, if wanted.
- No. 6 — 1 -lb. balls, in 500-lb. bales; larger balls, if wanted.
- No. 7 — 1 $\frac{1}{4}$ -lb. balls, in 500-lb. bales; larger balls, if wanted.
- No. 8 — 1 $\frac{1}{2}$ -lb. balls, in 500-lb. bales; larger balls, if wanted.
- No. 9 — 2 -lb. balls, in 500-lb. bales; larger balls, if wanted.
- No. 10 — 5 -lb. balls, in 500-lb. bales; larger balls, if wanted.
- 100-lb., 150-lb., 200-lb. coils stranded many ends.
- 25-lb. to 100-lb. reels, single end.
- 10-lb. to 35-lb. universal wound tubes.

JUTE WRAPPING TWINES

Made from fine-spun jute yarns, from 2-ply to 12-ply, in two grades. Generally used for small packages or where the strength requirements are not severe.

No. 1. Stainless; only carefully selected light colored fibre used. Very evenly spun, strong and handsome.

No. 2. Stainless; the popular grade; not so light in color, but well made and very satisfactory for most purposes.

Regular Packings.

- $\frac{1}{2}$ -lb balls, loose, in 150-lb. bales or barrels.
- 50-lb. to 100-lb. reels, single ends.
- 50-lb. to 100-lb. coils, stranded many ends.
- 10-lb. to 35-lb. universal wound tubes.

TWINES CLASSIFIED AND DESCRIBED**JUTE TUBING OR TUBE CORD**

Made from heavy or coarse spun jute yarn in from 4-ply to 10-ply. Very strong and suited for heavy work.

Special—Stainless; only selected fibre of good color and strength is used in this grade, hence it makes an excellent appearance as well as having unusual strength.

No. 2. Stainless; generally used for miscellaneous work, as it is evenly spun and has good strength.

Regular Packings.

10-lb. balls, 500-lb. bales.

50-lb. to 100-lb. reels, single end.

50-lb. to 200-lb. coils, single end or stranded many ends.

10-lb. to 35-lb. universal wound tubes.

JUTE ROPE

Made in three grades and in diameters of $\frac{1}{8}$ inch, $\frac{1}{4}$ inch, $\frac{3}{8}$ inch and $\frac{1}{2}$ inch.

No. 1. Stainless; a light colored, high-grade rope of attractive appearance and good strength. Largely used in tent and awning work.

No. 2. Stainless; a strong, well-built rope for general purpose work.

B. Not stainless; suitable for any use which does not require a stainless cord.

Regular packings, 50-lb. to 75-lb. coils, single end.

WOOL TWINES

These twines are used for tying fleeces or for other temporary purposes. They are not stainless and are made in two grades.

Unfinished—A soft 3-ply or 4-ply twine, put up in 1-lb. balls and 150-lb. bales.

Finished—A hard polished 2-ply jute twine, put up in 1-lb. balls and 150-lb. bales.

TARRED TWINES

Our assortment of Tarred Twines is complete and of recognized excellence. Both the No. 1, or hemp grade, and the No. 2, or jute grade, are made from selected fibres, carefully spun into even yarns and then passed through a treatment of high-grade tar. The leading twines are as follows:

MARLINE

Made in the medium and fine sizes of yarn, put up 2-ply in 1-lb. balls or in coils or reels, either single end or stranded many ends.

SPUN YARN

Put up in either 2-ply or 3-ply from a very heavy yarn and packed in large balls, coils or reels.

PIPE CORD

Three-ply or 4-ply coarse spun Jute Twine, evenly tarred and put up in balls, in coils or on reels.

COMMERCIAL TWINE DIFFERENTIAL

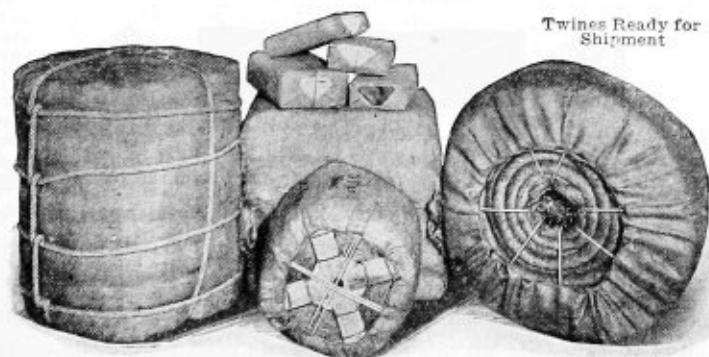
No. 18 size carries the basis price for all sizes of Fine Finished Twines; No. 6 for Coarse Finished Twines. These basis prices will be sent out as circumstances demand their change or may be had at any time upon request.

FINE FINISHED TWINES

No. 18.....	BASIS
No. 12.....	4c per pound over basis price
No. 24.....	$\frac{1}{2}$ c per pound under basis price
No. 36.....	1c per pound under basis price
No. 48.....	$1\frac{1}{2}$ c per pound under basis price
No. 60.....	$1\frac{1}{2}$ c per pound under basis price

COARSE FINISHED TWINES

No. 6.....	BASIS
No. $4\frac{1}{2}$	$\frac{1}{2}$ c per pound over basis price
No. 5.....	1c per pound over basis price
No. 7.....	$\frac{1}{2}$ c per pound under basis price
No. 8.....	1c per pound under basis price
No. 9.....	1c per pound under basis price
No. 10.....	1c per pound under basis price



Twines Ready for Shipment

WIRE ROPE LAYS

RIGHT LAY ROPE



FIG. 4605

LEFT LAY ROPE



FIG. 4606

Wire rope is usually made Right Lay. This is standard. The use of Left Lay rope is usually confined to conditions where rope is used in pairs, using both a Right Lay and a Left Lay rope, thus the natural tendency of one rope to untwist is offset by the other.

Left Lay rope is frequently used for drilling deep wells, such as for oil or gas.

REGULAR LAY ROPE



FIG. 4607

LANG'S LAY ROPE



FIG. 4608

In Regular Lay rope the wires in the strands are twisted in one direction and the strands are twisted in the opposite direction. This is Regular or Standard Lay.

In Lang's Lay rope the wires in the strands and the strands in the rope are twisted in the same direction. This construction produces a greater wearing surface on each individual wire and tends to resist the wear from friction or dragging over rollers or the ground, but this construction will much more easily untwist or "kink" than Regular Lay, and it is much more difficult to splice securely.

"MONARCH WHYTE STRAND" WIRE ROPE

"Monarch Whyte Strand" Rope is superior in wearing quality to any rope manufactured. This may appear as a broad statement, but it is one of fact, and, in every instance where an opportunity has been given to demonstrate it, never has it been disapproved. "Monarch" wire is the perfection of wire-making art. When its high tensile strength is considered (125 tons to the square inch) the ductility obtained is remarkable. It will withstand the most stringent tests. It is always uniform and dependable. When this wire is received it is tested, and unless our standards have been complied with minutely the wire is rejected. In the manufacture of this rope, as in all of our other ropes, great care is exercised. The lay of the wires in the strands, as well as the strands themselves, are perfectly proportioned so as to give each wire an equal portion of the working load as well as eliminating the internal wear to the greatest possible degree. The core is a number one hard laid manila rope, this preventing the rope from pulling in and thus distorting its lays when subjected to severe strains. "Monarch Whyte Strand" Rope has been adopted by quarrymen and contractors all over the country and by them considered an ideal rope. "Monarch Whyte Strand" Rope is made in various constructions to suit individual needs. It is absolutely a safe rope; incomparable in wearing quality, in tensile strength and ductility to any other wire rope on the market. "Monarch Whyte Strand" Rope is trade-marked and in order to designate it one strand in each rope is painted "Whyte."



TRADE MARK REGISTERED.

"MONARCH WHYTE STRAND" HOISTING ROPE

(6x19)



6 STRANDS—19 WIRES
IN EACH STRAND—1
HEMP CENTER

FIG. 4609

Telegraph Name	List Price Per Foot	Diameter in Inches	Circumference in Inches	Approximate Weight Per Foot	Approximate Strength in Tons of 2000 lbs.	Proper Working Load in Tons of 2000 lbs.	Diameter of Drum or Sheave in Feet	Advised
Macaroon ..	\$0.13	1 1/4	3 3/4	.10	3.15	.63	1	
Macaw	.13 1/2	1 1/2	1	.15	4.50	.9	1 1/4	
Mace	.14 1/2	1 3/8	1 1/8	.22	6.75	1.35	1 1/2	
Mackerel ..	.15 1/2	1 7/8	1 1/4	.30	9.4	1.9	1 3/4	
Macron	.17	1 3/2	1 1/2	.39	12.1	2.4	2	
Mad	.19	1 3/8	1 3/4	.50	14.5	2.9	2 1/4	
Madam	.22 1/2	1 3/8	2	.62	19	3.8	2 1/2	
Madcap	.31	1 3/4	2 1/4	.89	26.3	5.3	3	
Maggot	.39	1 7/8	2 3/4	1.20	35	7	3 1/4	
Magic	.50	1	3	1.58	45	9	4	
Magnate	.62	1 3/8	3 1/2	2	56	11	4 1/2	
Maid	.75	1 1/4	4	2.45	69	14	5	
Major	.90	1 3/8	4 1/4	3	84	17	5 1/2	
Malice	1.10	1 1/2	4 3/4	3.55	98	20	6	
Malign	1.30	1 5/8	5	4.15	110	22	6 1/2	
Mallet	1.60	1 3/4	5 1/2	4.85	133	27	7	
Mallow	1.75	1 7/8	5 3/4	5.55	150	30	8	
Maltese	1.85	2	6 1/4	6.30	166	33	8	
Manacle	2.50	2 1/4	7 1/8	8	210	42	9	
Mandate	2.80	2 1/2	7 3/8	9.85	263	53	10	
Mango	3.45	2 3/4	8 3/8	11.95	315	63	11	

All ropes not listed above and composed of strands made up of more than 19 and less than 37 wires, take 37 wire list.

(6 x 19)



FIG. 4610



**"MAC WHYTE"
PLOUGH STEEL
HOISTING ROPE**

**6 STRANDS—19 WIRES
IN EACH STRAND—
1 HEMP CENTER**

Telegraph Name	List price per foot	Diameter in inches	Circumference in inches	Approximate Weight per foot	Approximate Strength in tons of 2000 lbs.	Proper Working Load in tons of 2000 lbs.	Diameter of Drum or Sheave in feet advised
Patrol	\$0.12	$\frac{1}{4}$	$\frac{3}{4}$	.10	2.65	.53	1
Patter	.12 $\frac{1}{4}$	$\frac{5}{16}$	1	.15	3.8	.76	1.25
Pause	.12 $\frac{1}{2}$	$\frac{3}{8}$	1 $\frac{1}{8}$	.22	5.75	1.15	1.50
Pawn	.13	$\frac{7}{16}$	1 $\frac{1}{4}$	.30	8	1.6	1.75
Peace	.14	$\frac{1}{2}$	1 $\frac{1}{2}$	.39	10	2	2
Pearl	.16	$\frac{5}{8}$	1 $\frac{3}{4}$	.50	12.3	2.4	2.25
Pebble	.19	$\frac{3}{4}$	2	.62	15.5	3.1	2.5
Pendant	.26	$\frac{7}{8}$	2 $\frac{1}{4}$	.89	23	4.6	3
Pelt	.34	1	2 $\frac{3}{4}$	1.20	29	5.8	3.5
Pen	.43	1 $\frac{1}{8}$	3	1.58	38	7.6	4
Pencil	.54	1 $\frac{1}{4}$	3 $\frac{1}{2}$	2	47	9.4	4.5
Penman	.65	1 $\frac{1}{2}$	4	2.45	58	12	5
Pension	.79	1 $\frac{3}{8}$	4 $\frac{1}{4}$	3	72	14	5.5
Pepper	.93	1 $\frac{1}{2}$	4 $\frac{3}{4}$	3.55	82	16	6
Perch	1.08	1 $\frac{5}{8}$	5	4.15	94	19	6.5
Perfect	1.30	1 $\frac{3}{4}$	5 $\frac{1}{2}$	4.85	112	22	7
Perfume	1.46	1 $\frac{7}{8}$	5 $\frac{3}{4}$	5.55	127	25	8
Period	1.58	2	6 $\frac{1}{4}$	6.3	140	28	8
Petty	2.00	2 $\frac{1}{4}$	7 $\frac{1}{4}$	8	186	37	9
Petunia	2.50	2 $\frac{1}{2}$	7 $\frac{7}{8}$	9.85	229	46	10
Pewter	3.00	2 $\frac{3}{4}$	8 $\frac{1}{2}$	11.95	275	55	11

All ropes not listed above and composed of strands made up of more than 19 and less than 37 wires, take 37 wire list.

"MAC WHYTE" MILD PLOUGH STEEL HOISTING ROPE
6 STRANDS—19 WIRES IN EACH STRAND—1 HEMP CENTER

Telegraph Name	List price per foot	Diameter in inches	Circumference in inches	Approximate Weight per foot	Approximate Strength in tons of 2000 lbs.	Proper Working Load in tons of 2000 lbs.	Diameter of Drum or Sheave in feet advised
Oak	\$0.10 $\frac{1}{2}$	$\frac{1}{4}$	$\frac{3}{4}$	.10	2.43	.49	1
Oasis	.10 $\frac{3}{4}$	$\frac{5}{16}$	1	.15	3.50	.70	1.25
Oath	.11	$\frac{3}{8}$	1 $\frac{1}{8}$	.22	5.30	1.06	1.50
Obese	.11 $\frac{1}{2}$	$\frac{7}{16}$	1 $\frac{1}{4}$	.30	7.25	1.45	1.75
Obit	.12 $\frac{1}{2}$	$\frac{1}{2}$	1 $\frac{1}{2}$	.39	9.2	1.84	2
Obscene	.14	$\frac{5}{8}$	1 $\frac{3}{4}$	.65	11.2	2.24	2.25
Obstruct	.16 $\frac{1}{2}$	$\frac{3}{4}$	2	.62	14	2.80	2.5
Obtuse	.22	$\frac{7}{8}$	2 $\frac{1}{4}$	.89	20.2	4.04	3
Occult	.29	1	2 $\frac{3}{4}$	1.20	26	5.20	3.5
Ocean	.37	1 $\frac{1}{8}$	3	1.58	34	6.80	4
Ocher	.46	1 $\frac{1}{4}$	3 $\frac{1}{2}$	2	43	8.6	4.5
Octave	.56	1 $\frac{1}{2}$	4	2.45	53	10.6	5
Ode	.68	1 $\frac{3}{8}$	4 $\frac{1}{4}$	3	64	12.8	5.5
Offend	.80	1 $\frac{1}{2}$	4 $\frac{3}{4}$	3.55	73	14.6	6
Ogle	.94	1 $\frac{5}{8}$	5	4.15	83	16.6	6.5
Okra	1.10	1 $\frac{3}{4}$	5 $\frac{1}{2}$	4.85	99	19.8	7
Oil	1.25	1 $\frac{7}{8}$	5 $\frac{3}{4}$	5.55	112	22.4	8
Olive	1.34	2	6 $\frac{1}{4}$	6.3	123	24.6	8
Omit	1.70	2 $\frac{1}{4}$	7 $\frac{1}{4}$	8	160	32	9
Onset	2.10	2 $\frac{1}{2}$	7 $\frac{7}{8}$	9.85	200	40	10
Onward	2.55	2 $\frac{3}{4}$	8 $\frac{1}{2}$	11.95	243	48.6	11

All ropes not listed above and composed of strands made up of more than 19 and less than 37 wires, take 37 wire list.

"MACWHYTE" CRUCIBLE STEEL HOISTING ROPE
6 STRANDS—19 WIRES IN EACH STRAND—1 HEMP CENTER
 (6x19)



FIG. 4611

Telegraph Name	List Price per foot	Diameter in inches	Circumference in inches	Approximate Weight per foot	Approximate Strength in tons of 2000 lbs.	Proper Working Load in tons of 2000 lbs.	Diameter of Drum or Spool in feet advised
Cabinet	\$0.09	$\frac{1}{4}$	$\frac{3}{4}$	.10	2.2	.44	1
Cabin	.09 $\frac{1}{4}$	$\frac{1}{8}$	1	.15	3.1	.62	1.25
Cabal	.09 $\frac{1}{2}$	$\frac{3}{8}$	1 $\frac{1}{8}$	.22	4.8	.96	1.50
Cackle	.10	$\frac{1}{2}$	1 $\frac{1}{4}$	.30	6.5	1.30	1.75
Caddy	.11	$\frac{1}{2}$	1 $\frac{1}{2}$	.39	8.4	1.68	2
Cadet	.12	$\frac{3}{8}$	1 $\frac{3}{4}$	.50	10	2	2.25
Cage	.14	$\frac{5}{8}$	2	.62	12.5	2.5	2.5
Calf	.19	$\frac{3}{4}$	2 $\frac{1}{4}$	.89	17.5	3.5	3
Cancer	.24	$\frac{7}{8}$	2 $\frac{3}{4}$	1.20	23	4.6	3.5
Candid	.31	1	3	1.58	30	6	4
Cap	.38	1 $\frac{1}{8}$	3 $\frac{1}{2}$	2	38	7.6	4.5
Carat	.46	1 $\frac{1}{4}$	4	2.45	47	9.4	5
Cask	.56	1 $\frac{3}{8}$	4 $\frac{1}{4}$	3	56	11.2	5.5
Castle	.66	1 $\frac{1}{2}$	4 $\frac{3}{4}$	3.55	64	12.8	6
Catch	.77	1 $\frac{5}{8}$	5	4.15	72	14.4	6.5
Cater	.90	1 $\frac{3}{4}$	5 $\frac{1}{2}$	4.85	85	17	7
Catholic	1.02	1 $\frac{7}{8}$	5 $\frac{3}{4}$	5.55	96	19	8
Catkin	1.16	2	6 $\frac{1}{4}$	6.30	106	21.2	8
Caucus	1.44	2 $\frac{1}{4}$	7 $\frac{1}{8}$	8	133	26.6	9
Cavern	1.75	2 $\frac{3}{8}$	7 $\frac{7}{8}$	9.85	170	34	10
Cavity	2.10	2 $\frac{3}{4}$	8 $\frac{3}{8}$	11.95	211	42.2	11

All ropes not listed above and composed of strands made up of more than 19 and less than 37 wires, take 37 wire list.

"MACWHYTE" SWEDES IRON HOISTING ROPE
6 STRANDS—19 WIRES IN EACH STRAND—1 HEMP CENTER

Sable	\$0.06 $\frac{1}{2}$	$\frac{1}{4}$	$\frac{3}{4}$	.10	1.1	.22	1.50
Sack	.06 $\frac{3}{4}$	$\frac{1}{8}$	1	.15	1.5	.30	2
Sacred	.07	$\frac{3}{8}$	1 $\frac{1}{8}$	.22	2.4	.48	2.25
Sad	.07 $\frac{1}{2}$	$\frac{1}{2}$	1 $\frac{1}{4}$	.30	2.9	.58	2.75
Safe	.08 $\frac{1}{2}$	$\frac{1}{2}$	1 $\frac{1}{2}$	.39	3.9	.78	3
Saint	.10	$\frac{3}{8}$	1 $\frac{3}{4}$	.50	4.7	.94	3.5
Sago	.12	$\frac{5}{8}$	2	.62	6	1.20	4
Salt	.16	$\frac{3}{4}$	2 $\frac{1}{4}$	.89	8.5	1.70	4.5
Sand	.20	$\frac{7}{8}$	2 $\frac{3}{4}$	1.20	11.8	2.36	5.5
Sapid	.26	1	3	1.58	14.5	2.90	6
Satan	.33	1 $\frac{1}{8}$	3 $\frac{1}{2}$	2	18.6	3.72	7
Sash	.40	1 $\frac{1}{4}$	4	2.45	22.8	4.56	7.5
Sauce	.49	1 $\frac{3}{8}$	4 $\frac{1}{4}$	3	28	5.6	8.5
Savage	.57	1 $\frac{1}{2}$	4 $\frac{3}{4}$	3.55	33	6.5	9
Saw	.65	1 $\frac{5}{8}$	5	4.15	38	7.6	10
Scalp	.80	1 $\frac{3}{4}$	5 $\frac{1}{2}$	4.85	44	8.8	11
Scarf	.88	1 $\frac{7}{8}$	5 $\frac{3}{4}$	5.55	50	10	12
Scene	.95	2	6 $\frac{1}{4}$	6.30	55	11	12
School	1.17	2 $\frac{1}{4}$	7 $\frac{1}{8}$	8	72	14.4	14
Schooner	1.40	2 $\frac{3}{8}$	7 $\frac{7}{8}$	9.85	92	18.4	15
Science	1.70	2 $\frac{3}{4}$	8 $\frac{3}{8}$	11.95	111	22.2	17

All ropes not listed above and composed of strands made up of more than 19 and less than 37 wires, take 37 wire list.

"MONARCH WHYTE STRAND" HAULAGE ROPE

6 STRANDS—7 WIRES IN EACH STRAND—1 HEMP CENTER

(6x7)



FIG. 4612

Telegraph Name	List Price Per Foot	Diameter in inches	Circumferences in inches	Approximate Weight Per Foot	Approximate Strength in Tons of 2000 lbs.	Proper Working Load in Tons of 2000 lbs.	Diameter of Drum or Sheave in Feet Advised
Medley	.08 $\frac{3}{4}$	$\frac{1}{8}$	1 $\frac{1}{4}$	.30	7 $\frac{3}{4}$	1.5	3
Medley	.11 $\frac{1}{2}$	$\frac{1}{8}$	1 $\frac{1}{4}$	.30	7 $\frac{3}{4}$	1.5	3
Meet	.13 $\frac{1}{2}$	$\frac{1}{8}$	1 $\frac{1}{2}$	.39	11	2.2	3 $\frac{1}{2}$
Melon	.17	$\frac{3}{16}$	1 $\frac{3}{4}$	.50	13	2.6	4
Melt	.20 $\frac{1}{2}$	$\frac{9}{16}$	2	.62	17 $\frac{1}{2}$	3.5	4 $\frac{1}{2}$
Merino	.24 $\frac{1}{2}$	$\frac{1}{4}$	2 $\frac{1}{4}$	.75	20	4	4 $\frac{3}{4}$
Merit	.28 $\frac{1}{2}$	$\frac{3}{8}$	2 $\frac{1}{4}$	.89	25	5	5
Mesh	.37	$\frac{7}{8}$	2 $\frac{3}{4}$	1.20	33	6.6	6
Metal	.48	1	3	1.58	42	8.4	7
Meteor	.58	1 $\frac{1}{8}$	3 $\frac{1}{2}$	2	52	10	8
Metric	.72	1 $\frac{1}{4}$	4	2.45	67	13	9
Mettle	.88	1 $\frac{3}{8}$	4 $\frac{1}{4}$	3	79	16	10
Mewl	1.05	1 $\frac{1}{2}$	4 $\frac{3}{4}$	3.55	90	18	11

"MAC WHYTE" PLOUGH STEEL HAULAGE ROPE

6 STRANDS—7 WIRES IN EACH STRAND—1 HEMP CENTER

Telegraph Name	List Price Per Foot	Diameter in inches	Circumferences in inches	Approximate Weight Per Foot	Approximate Strength in Tons of 2000 lbs.	Proper Working Load in Tons of 2000 lbs.	Diameter of Drum or Sheave in Feet Advised
Planter	\$0.05 $\frac{1}{2}$	$\frac{3}{16}$	$\frac{7}{8}$	.12 $\frac{1}{2}$	3.4	.68	1 $\frac{1}{4}$
Plaque	.06	$\frac{1}{8}$	1	.15	4.4	.88	2 $\frac{1}{4}$
Plaster	.06 $\frac{3}{4}$	$\frac{3}{8}$	1 $\frac{1}{8}$	.22	5.9	1.2	2 $\frac{3}{4}$
Plate	.09	$\frac{1}{4}$	1 $\frac{1}{4}$	.30	7	1.4	3
Play	.11 $\frac{1}{2}$	$\frac{1}{2}$	1 $\frac{1}{2}$	.39	10	2	3 $\frac{1}{2}$
Plead	.14 $\frac{1}{2}$	$\frac{5}{8}$	1 $\frac{3}{4}$	.50	12	2.4	4
Please	.17 $\frac{1}{2}$	$\frac{3}{4}$	2	.62	16	3.2	4 $\frac{1}{2}$
Pleasure	.21	$\frac{1}{2}$	2 $\frac{1}{8}$	.75	18	3.6	4 $\frac{3}{4}$
Pledge	.24 $\frac{1}{2}$	$\frac{3}{4}$	2 $\frac{1}{4}$	.89	23	4.6	5
Plot	.32	$\frac{7}{8}$	2 $\frac{3}{4}$	1.20	31	6.2	6
Plume	.41	1	3	1.58	38	7.6	7
Plunge	.51	1 $\frac{1}{8}$	3 $\frac{1}{2}$	2	47	9.4	8
Ply	.62	1 $\frac{1}{4}$	4	2.45	60	12	9
Pluvial	.76	1 $\frac{3}{8}$	4 $\frac{1}{4}$	3	72	14.4	10
Plunder	.90	1 $\frac{1}{2}$	4 $\frac{3}{4}$	3.55	82	16.4	11

"MAC WHYTE" MILD PLOUGH STEEL HAULAGE ROPE**6 STRANDS—7 WIRES IN EACH STRAND—1 LEMP CENTER**

(6x7)

**FIG. 4613**

Telegraph Name	List Price Per Foot	Diameter In Inches	Circumference In Inches	Approximate Weight Per Foot	Approximate Strength In Tons of 2000 lbs.	Proper Working Load In Tons of 2000 lbs.	Diameter of Drum or Sheave in Feet Advised
Orchard	\$0.05	$\frac{3}{8}$	$\frac{7}{8}$	.12 $\frac{1}{2}$	2.95	.59	1 $\frac{3}{4}$
Orchid	.05 $\frac{1}{2}$	$\frac{7}{16}$	1	.15	3.95	.79	2 $\frac{1}{4}$
Ordain	.06	$\frac{3}{8}$	1 $\frac{1}{8}$	.22	5.25	1.05	2 $\frac{3}{4}$
Ordure	.07 $\frac{1}{2}$	$\frac{7}{16}$	1 $\frac{1}{4}$	.30	6.25	1.25	3
Organ	.09 $\frac{1}{2}$	$\frac{1}{2}$	1 $\frac{3}{8}$	.39	8.85	1.8	3 $\frac{1}{2}$
Orient	.12	$\frac{9}{16}$	1 $\frac{3}{4}$	.50	11	2.2	4
Oriole	.14 $\frac{1}{4}$	$\frac{5}{8}$	2	.62	14.5	2.9	4 $\frac{1}{2}$
Ornate	.17	$\frac{1}{2}$	2 $\frac{1}{8}$	.75	16.7	3.3	4 $\frac{3}{4}$
Orphan	.20	$\frac{3}{4}$	2 $\frac{1}{4}$	.89	21	4.2	5
Ostler	.27	$\frac{7}{8}$	2 $\frac{3}{4}$	1.20	28	5.6	6
Ought	.35	1	3	1.58	35	7	7
Oust	.44	1 $\frac{1}{8}$	3 $\frac{1}{2}$	2	43	8.6	8
Outing	.53	1 $\frac{1}{4}$	4	2.45	54	10.8	9
Outside	.64	1 $\frac{3}{8}$	4 $\frac{1}{4}$	3	63	12.6	10
Outrage ..	.75	1 $\frac{1}{2}$	4 $\frac{3}{4}$	3.55	73	14.6	11

All ropes not listed above and composed of more than 7 and less than 19 wires to the strand, with the exception of 6x8, take 19 wire list.

"MAC WHYTE" CRUCIBLE STEEL HAULAGE AND TRANSMISSION ROPE**6 STRANDS—7 WIRES IN EACH STRAND—1 HEMP CENTER**

Telegraph Name	List Price Per Foot	Diameter In Inches	Circumference In Inches	Approximate Weight Per Foot	Approximate Strength In Tons of 2000 lbs.	Proper Working Load In Tons of 2000 lbs.	Diameter of Drum or Sheave in Feet Advised
Dab	\$0.04	$\frac{3}{8}$	$\frac{7}{8}$	.12 $\frac{1}{2}$	2.5	.50	1 $\frac{3}{4}$
Dairy	.04 $\frac{1}{2}$	$\frac{7}{16}$	1	.15	3.5	.70	2 $\frac{1}{4}$
Damp	.05 $\frac{1}{2}$	$\frac{3}{8}$	1 $\frac{1}{8}$	.22	4.6	.92	2 $\frac{3}{4}$
Danger	.06 $\frac{1}{2}$	$\frac{7}{16}$	1 $\frac{1}{4}$	.30	5.5	1.1	3
Dark	.08	$\frac{1}{2}$	1 $\frac{1}{2}$	.39	7.7	1.5	3 $\frac{1}{2}$
Datum	.10	$\frac{9}{16}$	1 $\frac{3}{4}$	.50	10	2	4
Dawn	.12	$\frac{5}{8}$	2	.62	13	2.6	4 $\frac{1}{2}$
Deaf	.14 $\frac{1}{2}$	$\frac{1}{2}$	2 $\frac{1}{8}$	.75	15.4	3.1	4 $\frac{3}{4}$
Debar	.17	$\frac{3}{4}$	2 $\frac{1}{4}$	.89	18.6	3.7	5
Decade	.22 $\frac{1}{2}$	$\frac{7}{8}$	2 $\frac{3}{4}$	1.20	24	4.8	6
Deceit	.29	1	3	1.58	31	6.2	7
Dead	.36	1 $\frac{1}{8}$	3 $\frac{1}{2}$	2	37	7.4	8
Decoy	.43	1 $\frac{1}{4}$	4	2.45	46	9.2	9
Deed	.51	1 $\frac{3}{8}$	4 $\frac{1}{4}$	3	53	10.6	10
Deferred ..	.60	1 $\frac{1}{2}$	4 $\frac{3}{4}$	3.55	63	12.6	11

All ropes not listed above and composed of more than 7 and less than 19 wires to the strand, with the exception of 6x8, take 19 wire list.

"MAC WHYTE" SWEDES IRON TRANSMISSION ROPE**6 STRANDS—7 WIRES IN EACH STRAND—1 HEMP CENTER**

(6x7)

**FIG. 4614**

Telegraph Name	List price per foot	Diameter in inches	Circumference in inches	Approximate Weight per foot	Approximate Strength in tons of 2000 lbs	Proper Working load in tons of 2000 lbs.	Diameter of Drum or Sheave in feet advised
Sham	\$0.03 1/4	3/8	7/8	.12 1/2	1.2	.24	3
Sharp	.03 3/4	7/8	1	.15	1.7	.34	3.5
Shelf	.04 1/2	1 1/8	1 1/8	.22	2.2	.44	4
Sherry	.05 1/2	1 1/4	1 3/4	.30	2.6	.52	4.5
Shift	.06 1/2	1 1/2	1 7/8	.39	3.7	.74	5.5
Shire	.08 1/4	1 5/8	2 1/8	.50	4.8	.96	6
Shoal	.10	1 3/4	2	.62	6	1.2	7
Shred	.12	1 7/8	2 1/4	.75	7.3	1.5	7.25
Shine	.14	2	2 1/2	.89	8.8	1.7	7.5
Shun	.18 1/2	2 1/8	2 3/4	1.20	12	2.4	9
Shutter	.24	1	3	1.58	15	3	10.5
Shug	.30	1 1/8	3 1/2	2	19	3.8	12
Shrub	.36	1 1/4	4	2.45	23	4.6	13
Shuffle	.43	1 3/8	4 1/4	3	28	5.6	15
Shudder	.51	1 1/2	4 3/4	3.55	32	6.4	16

All ropes not listed above and composed of more than 7 and less than 19 wires to the strand, with the exception of 6x8, take 19 wire list.

EXTRA FLEXIBLE "MONARCH WHYTE STRAND" HOISTING ROPE**8 STRANDS—19 WIRES IN EACH STRAND—1 HEMP CENTER**

(8x19)

**FIG. 4615**

Exchange ..	\$0.19	1 1/2	1 1/2	.35	9.5	1.9	1.33
Excess	.22	1 5/8	1 3/4	.45	12	2.4	1.5
Except	.25	1 3/4	2	.56	15	3	1.75
Exceed	.34	1 7/8	2 1/4	.80	22	4.4	1.83
Excavate ..	.43	2	2 3/4	1.08	28	5.6	2.15
Example ...	.55	1	3	1.42	36	7.2	2.5
Examine ...	.68	1 1/8	3 1/2	1.80	46	9.2	2.83
Exalt	.82	1 1/4	4	2.20	56	11	3.2
Exactly ...	.98	1 3/8	4 1/4	2.70	68	13	3.5
Exact	1.19	1 1/2	4 3/4	3.19	80	16	3.75

"MAC WHYTE" EXTRA FLEXIBLE PLOUGH STEEL HOISTING ROPE

8 STRANDS-19 WIRES IN EACH STRAND-1 HEMP CENTER

(8x19)



FIG. 4616

Telegraph Name	List price per foot	Diameter in inches	Circumference in inches	Approximate Weight per foot	Approximate Strength in tons of 2000 lbs.	Proper Working Load in tons of 2000 lbs.	Diameter of Drum or Sheave in feet advised
Enlist	\$0.13 1/4	3/4	3 3/4	.09	2.25	.45	.75
Enjoin	.13 1/2	7/8	1	.13	3.35	.67	.83
Enigma	.14	3/8	1 1/4	.20	5.12	1.02	1
Engulf	.15	7/8	1 1/4	.27	6.90	1.38	1.16
Engrave	.16	1 1/2	1 1/2	.35	8.7	1.74	1.33
Engine	.18	5/8	1 3/4	.45	11.6	2.32	1.50
Engage	.21	5/8	2	.56	14	2.8	1.75
Enforce	.29	3/4	2 1/4	.80	20	4	1.83
Energy	.38	7/8	2 3/4	1.08	26	5.2	2.16
Enemy	.48	1	3	1.42	33	6.6	2.5
Endure	.60	1 1/8	3 1/2	1.80	43	8.6	2.83
Endow	.72	1 1/4	4	2.20	52	10.4	3.2
Endear	.87	1 3/8	4 1/4	2.70	64	12.8	3.5
Endanger	1.03	1 1/2	4 3/4	3.19	74	14.8	3.75

"MAC WHYTE" EXTRA FLEXIBLE MILD PLOUGH STEEL HOISTING ROPE

8 STRANDS-19 WIRES IN EACH STRAND-1 HEMP CENTER

Telegraph Name	List price per foot	Diameter in inches	Circumference in inches	Approximate Weight per foot	Approximate Strength in tons of 2000 lbs.	Proper Working Load in tons of 2000 lbs.	Diameter of Drum or Sheave in feet advised
Elusory	\$.11 3/4	3/4	3 3/4	.09	2.02	.40	.75
Elusion	.12	7/8	1	.13	3.05	.61	.83
Elude	.12 1/4	3/8	1 1/4	.20	4.66	.93	1
Elope	.13	7/8	1 1/4	.27	6.30	1.26	1.16
Elicit	.14	1 1/2	1 1/2	.35	8	1.6	1.33
Elfish	.16	5/8	1 3/4	.45	10.1	2	1.5
Elevate	.18 1/2	5/8	2	.56	12.4	2.5	1.75
Element	.25	3/4	2 1/4	.80	17.6	3.5	1.83
Elegy	.32	7/8	2 3/4	1.08	23	4.6	2.16
Elegant	.41	1	3	1.42	29.7	5.9	2.5
Elect	.51	1 1/8	3 1/2	1.80	38	7.6	2.83
Elder	.62	1 1/4	4	2.20	47	9.4	3.2
Elbow	.75	1 3/8	4 1/4	2.70	57	11	3.5
Elapse	.88	1 1/2	4 3/4	3.19	66	13	3.75

"MAC WHYTE" EXTRA FLEXIBLE CRUCIBLE STEEL HOISTING ROPE

8 STRANDS-19 WIRES IN EACH STRAND-1 HEMP CENTER

(8 x 19)



FIG. 4617

Telegraph Name	List price per foot	Diameter in inches	Circumference in inches	Approximate Weight per foot	Approximate Strength in tons of 2000 lbs.	Proper Work- ing Load in tons of 2000 lbs.	Diameter of Drum or Sheave in feet advised
Edict	\$.10	$\frac{1}{4}$	$\frac{3}{4}$	.09	1.80	.36	.75
Edible	.10 $\frac{1}{4}$	$\frac{5}{16}$	1	.13	2.75	.55	.83
Edge	.10 $\frac{1}{2}$	$\frac{3}{8}$	1 $\frac{1}{8}$	.20	4.2	.84	1
Eddy	.11	$\frac{1}{2}$	1 $\frac{1}{4}$	.27	5.7	1.14	1.16
Eclipse	.12	$\frac{1}{2}$	1 $\frac{1}{2}$	.35	7.3	1.46	1.33
Eclat	.14	$\frac{5}{16}$	1 $\frac{3}{4}$	.45	8.7	1.74	1.5
Echo	.16	$\frac{3}{8}$	2	.56	10.9	2.18	1.75
Ebony	.21	$\frac{3}{4}$	2 $\frac{1}{4}$	.80	15.3	3.06	1.83
Eaves	.27	$\frac{7}{8}$	2 $\frac{3}{4}$	1.08	20	4	2.16
Easter	.34	1	3	1.42	26	5.2	2.5
Easel	.42	1 $\frac{1}{8}$	3 $\frac{1}{2}$	1.80	34	6.8	2.83
Earth	.51	1 $\frac{1}{4}$	4	2.20	42	8.4	3.2
Earl	.62	1 $\frac{3}{8}$	4 $\frac{1}{4}$	2.70	51	10.2	3.5
Eagle	.73	1 $\frac{1}{2}$	4 $\frac{3}{4}$	3.19	58	11.6	3.75

"MAC WHYTE" SPECIAL STEEL TRACTION ELEVATOR CABLES

8 STRANDS-19 WIRES IN EACH STRAND-1 HEMP CENTER

Telegraph Name	List price per foot	Diameter in inches	Circumference in inches	Approximate Weight per foot	Approximate Strength in tons of 2000 lbs.	Proper Work- ing Load in tons of 2000 lbs.	Diameter of Drum or Sheave in feet advised
Egg	\$.09 $\frac{1}{2}$	$\frac{1}{2}$	1 $\frac{1}{2}$	.35	5	1	3
Ego	.11 $\frac{1}{2}$	$\frac{5}{8}$	1 $\frac{3}{4}$	.45	6	1.2	3.5
Elder	.14	$\frac{3}{4}$	2	.56	7	1.4	4
Eke	.18	$\frac{7}{8}$	2 $\frac{1}{4}$	.80	9.5	1.9	4.5
Elect	.22	1	2 $\frac{3}{4}$	1.08	13	2.6	5.5
Elite	.29	1	3	1.42	16	3.1	6

This rope is made of a special grade of steel, and is of a special construction particularly adaptable to the hard usage on elevators known as the traction type.

SPECIAL FLEXIBLE "MONARCH WHYTE STRAND" HOISTING ROPE

6 STRANDS—37 WIRES IN EACH STRAND—1 HEMP CENTER

(6 x 37)



FIG. 4618

Telegraph Name	List price per foot	Diameter in inches	Circumference in inches	Approximate Weight per foot	Approximate Strength in tons of 2000 lbs.	Proper Working Load in tons of 2000 lbs.	Diameter of Inner Sheave in feet advised
Rooster	\$.17 $\frac{1}{2}$	$\frac{3}{8}$	1 $\frac{1}{8}$	.22	5.30	1.06	1
Roost	.18 $\frac{1}{2}$	$\frac{7}{16}$	1 $\frac{1}{4}$	.30	7.50	1.5	1.15
Rookery	.20	$\frac{1}{2}$	1 $\frac{3}{8}$	.39	9.75	1.9	1.33
Rook	.23	$\frac{5}{8}$	1 $\frac{3}{4}$	.50	12 $\frac{1}{2}$	2.5	1.50
Romish	.27	$\frac{3}{4}$	2	.62	16	3.2	1.75
Romany	.36	$\frac{3}{4}$	2 $\frac{1}{4}$	.89	23	4.6	1.83
Romantic	.46	$\frac{7}{8}$	2 $\frac{3}{4}$	1.20	29	5.8	2.16
Romance	.59	1	3	1.58	37	7.4	2.50
Roman	.75	1 $\frac{1}{8}$	3 $\frac{1}{2}$	2	46	9.2	2.83
Roller	.86	1 $\frac{1}{4}$	4	2.45	58	11	3.20
Rogue	1.05	1 $\frac{3}{8}$	4 $\frac{1}{4}$	3	71	14	3.50
Rodent	1.25	1 $\frac{1}{2}$	4 $\frac{3}{4}$	3.55	84	17	3.75
Rocker	1.45	1 $\frac{5}{8}$	5	4.15	95	19	....
Robust	1.75	1 $\frac{3}{4}$	5 $\frac{1}{2}$	4.85	113	23	....
Roborate	1.92 $\frac{1}{2}$	1 $\frac{7}{8}$	5 $\frac{3}{4}$	5.55	125	25	....
Robin	2.10	2	6 $\frac{1}{4}$	6.30	137	27	....
Robber	2.50	2 $\frac{1}{4}$	7 $\frac{1}{8}$	8	184	37	....
Roast	3.15	2 $\frac{1}{2}$	7 $\frac{7}{8}$	9.85	225	45	....
Roam	3.75	2 $\frac{3}{4}$	8 $\frac{5}{8}$	11.95	278	55	....

MAC WHYTE SPECIAL FLEXIBLE PLOUGH STEEL HOISTING ROPE

6 STRANDS—37 WIRES IN EACH STRAND—1 HEMP CENTER

Rivet	\$0.15	$\frac{3}{8}$	1 $\frac{1}{8}$	.22	5.1	1	1
Rivalry	.16	$\frac{7}{16}$	1 $\frac{1}{4}$	.30	7.2	1.4	1.16
Ritual	.17	$\frac{1}{2}$	1 $\frac{1}{2}$	.39	9.25	1.85	1.33
Risk	.20	$\frac{5}{8}$	1 $\frac{3}{4}$	.50	11.5	2.3	1.5
Rising	.24	$\frac{3}{4}$	2	.62	14	3	1.75
Ripple	.31	$\frac{3}{4}$	2 $\frac{1}{4}$	.89	21	4	1.83
Ripe	.40	$\frac{7}{8}$	2 $\frac{3}{4}$	1.20	27	5	2.16
Riot	.51	1	3	1.58	35	7	2.5
Rinse	.64	1 $\frac{1}{8}$	3 $\frac{1}{2}$	2	44	9	2.83
Ringlet	.75	1 $\frac{1}{4}$	4	2.45	55	11	3.2
Ring	.91	1 $\frac{3}{8}$	4 $\frac{1}{4}$	3	68	14	3.5
Rime	1.10	1 $\frac{1}{2}$	4 $\frac{3}{4}$	3.55	80	16	3.75
Rigid	1.25	1 $\frac{5}{8}$	5	4.15	90	18	....
Rightful	1.50	1 $\frac{3}{4}$	5 $\frac{1}{2}$	4.85	108	22	....
Rigorous	1.65	1 $\frac{7}{8}$	5 $\frac{3}{4}$	5.55	119	24	....
Rigging	1.80	2	6 $\frac{1}{4}$	6.30	130	26	....
Rifle	2.20	2 $\frac{1}{4}$	7 $\frac{1}{8}$	8	175	35	....
Ridge	2.75	2 $\frac{1}{2}$	7 $\frac{7}{8}$	9.85	214	43	....
Riddle	3.30	2 $\frac{3}{4}$	8 $\frac{5}{8}$	11.95	265	53	....

"MAC WHYTE" SPECIAL FLEXIBLE MILD PLOUGH STEEL HOISTING ROPE

6 STRANDS—37 WIRES IN EACH STRAND—1 HEMP CENTER
(6x37)



FIG. 4619

Telegraph Name	List price, per foot	Diameter in inches	Circumference in inches	Approximate weight per foot	Approximate strength in tons of 2000 lbs.	Proper Working Load in tons of 2000 lbs.	Diameter of Drums or Shafts in feet advised
Recoup	\$0.13	$\frac{3}{8}$	$1\frac{1}{8}$	.22	4.65	.93	1
Record	.14	$\frac{7}{16}$	$1\frac{1}{4}$	.30	6.35	1.27	1.16
Reconcile ..	.15	$\frac{1}{2}$	$1\frac{1}{2}$	.39	8.25	1.65	1.23
Rcoil	.17 $\frac{1}{2}$	$\frac{5}{8}$	$1\frac{3}{4}$	.50	10.5	2.1	1.5
Recline	.21	$\frac{3}{4}$	2	.62	12.6	2.5	1.75
Reckon	.27	$\frac{7}{8}$	$2\frac{1}{4}$	.89	19	3.8	1.83
Recipe	.34	1	$2\frac{3}{4}$	1.20	25	5	2.16
Recess	.44	$1\frac{1}{8}$	3	1.58	32	6.4	2.5
Recede	.55	$1\frac{1}{4}$	$3\frac{1}{2}$	2	39	8	2.83
Recall	.65	$1\frac{1}{2}$	4	2.45	50	10	3.20
Rebuke	.78	$1\frac{3}{4}$	$4\frac{1}{4}$	3	61	12	3.5
Rebuff	.95	$1\frac{1}{2}$	$4\frac{3}{4}$	3.55	71	14	3.75
Rebate	1.07	$1\frac{5}{8}$	5	4.15	79	16	...
Reason	1.28	$1\frac{3}{4}$	$5\frac{1}{2}$	4.85	95	19	...
Reaper	1.41 $\frac{1}{2}$	$1\frac{7}{8}$	$5\frac{3}{4}$	5.55	106	21	...
Realm	1.55	2	$6\frac{1}{4}$	6.30	117	23	...
Reality	1.90	$2\frac{1}{4}$	$7\frac{1}{8}$	8	150	30	...
Read	2.35	$2\frac{1}{2}$	$7\frac{7}{8}$	9.85	187	37	...
Reach	2.80	$2\frac{3}{4}$	8 $\frac{1}{8}$	11.95	233	47	...

"MAC WHYTE" SPECIAL FLEXIBLE CRUCIBLE STEEL HOISTING ROPE

6 STRANDS—37 WIRES IN EACH STRAND—1 HEMP CENTER

Telegraph Name	List price, per foot	Diameter in inches	Circumference in inches	Approximate weight per foot	Approximate strength in tons of 2000 lbs.	Proper Working Load in tons of 2000 lbs.	Diameter of Drums or Shafts in feet advised
Rampage ..	\$0.12	$\frac{3}{8}$	$1\frac{1}{8}$	.22	4.2	.84	1
Ramouse ...	.12 $\frac{1}{2}$	$\frac{7}{16}$	$1\frac{1}{4}$	.30	5.5	1.1	1.16
Ramify	.13	$\frac{1}{2}$	$1\frac{1}{2}$	.39	7.25	1.45	1.33
Ramble	.15	$\frac{5}{8}$	$1\frac{3}{4}$	.50	9.5	1.9	1.5
Rakish	.18	$\frac{3}{4}$	2	.62	11.2	2.2	1.75
Raisin	.23	$\frac{7}{8}$	$2\frac{1}{4}$	.89	17.5	3.5	1.83
Raiment	.28	1	$2\frac{3}{4}$	1.20	23	5	2.16
Raid	.37	$1\frac{1}{8}$	3	1.58	29	6	2.5
Raging	.46	$1\frac{1}{4}$	$3\frac{1}{2}$	2	34	7	2.83
Rafter	.55	$1\frac{1}{2}$	4	2.45	45	9	3.2
Raffle	.65	$1\frac{3}{4}$	$4\frac{1}{4}$	3	55	11	3.5
Radish	.79	$1\frac{1}{2}$	$4\frac{3}{4}$	3.55	63	12	3.75
Radical	.89	$1\frac{5}{8}$	5	4.15	71	14	...
Radial	1.05	$1\frac{3}{4}$	$5\frac{1}{2}$	4.85	84	17	...
Racovian	1.20	$1\frac{7}{8}$	$5\frac{3}{4}$	5.55	94	19	...
Rack	1.35	2	$6\frac{1}{4}$	6.30	105	21	...
Racer	1.60	$2\frac{1}{4}$	$7\frac{1}{8}$	8	125	25	...
Rabies	1.92	$2\frac{1}{2}$	$7\frac{7}{8}$	9.85	160	32	...
Rabbit	2.30	$2\frac{3}{4}$	8 $\frac{1}{8}$	11.95	200	40	...

"MAC WHYTE" TILLER ROPE

6 STRANDS—EACH STRAND COMPOSED OF 6 ADDITIONAL STRANDS OF
7 WIRES EACH—7 HEMP CENTERS

(6x42)



FIG. 4620

Telegraph Name		List Price per Foot		Diameter in inches	Circumference in inches	Approximate Weight per foot	Diameter of Drum or Sheave in Ins. Advised	Approximate Breaking Strength in Pounds	
Iron	Steel	Iron	Steel					Iron	Steel
Tab	Teach	\$0.07½	\$0.11	¼	¾	.07	6	1,300	2,500
Tacit	Tease	.08	.12½	⅝	1	.11	7½	1,900	3,600
Taffy	Tedious	.09	.14	¾	1½	.16	9	3,000	4,800
Tailer	Teeth	.10	.15	⅞	1¾	.21	10½	4,000	6,500
Tame	Teller	.11½	.17	1	2	.28	12	5,800	9,000
Tangle	Temper	.14	.20	1¼	2½	.35	13½	6,300	11,000
Taper	Tenant	.17	.24	1½	3	.43	15	7,000	13,500
Tarter	Tench	.22	.30	1¾	3½	.62	18	11,000	18,000
Tattoo	Tendon	.27	.36	2	4	.84	21	15,500	26,000
Tavern	Tennis	.33	.43	2½	5	1.10	24	22,000	35,000

For galvanized or tinned tiller rope, add 10 per cent to above list prices.

GALVANIZED STEEL STRAND

7 WIRES TWISTED INTO A SINGLE STRAND

(1x7)



FIG. 4621

STANDARD STEEL STRAND—SINGLE OR DOUBLE GALVANIZED

Diameter	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{5}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{5}{8}$
Price	per 100 feet								
	\$1.00	1.25	1.75	2.75	3.50	4.50	5.50	7.50	8.50

"MAC WHYTE" GALVANIZED IRON SHIP RIGGING AND GUY ROPES

(6x7)



6 STRANDS—7 WIRES OR
12 WIRES IN EACH
STRAND—1 HEMP
CENTER

FIG.
4622

Telegraph Name	List Price per Foot		Diameter in inches	Circumference in inches	Approximate Weight per foot	Approximate Strength in tons of 2000 lbs.	Circumference of equal Manilla rope
	7 Wires per Strand	12 Wires per Strand					
Gutter	\$0.02	.....	$\frac{3}{16}$	$\frac{1}{2}$	.04	.61	1 $\frac{1}{2}$
Gusto	.02 $\frac{1}{4}$	.....	$\frac{7}{32}$	$\frac{5}{8}$	.063	.79	1 $\frac{3}{4}$
Gusset	.02 $\frac{1}{2}$	.....	$\frac{1}{4}$	$\frac{3}{4}$	.09	.99	1 $\frac{1}{2}$
Gurgle	.03	.....	$\frac{1}{8}$	$\frac{7}{8}$	.125	1.20	1 $\frac{3}{4}$
Gumption	.03 $\frac{1}{2}$	.....	$\frac{1}{2}$	1	.15	1.42	2
Gullet	.04 $\frac{1}{2}$	.....	$\frac{3}{8}$	1 $\frac{1}{8}$	.22	1.95	2 $\frac{1}{4}$
Gulch	.05	.....	$\frac{1}{2}$	1 $\frac{1}{4}$	.30	2.35	2 $\frac{1}{2}$
Guide	.06	.....	$\frac{1}{2}$	1 $\frac{1}{2}$	.39	3.39	3
Gudgeon	.07	.....	$\frac{1}{2}$	1 $\frac{3}{4}$	.50	4.46	3 $\frac{3}{4}$
Guard	.08	.....	$\frac{5}{8}$	2	.62	5.7	4 $\frac{1}{2}$
Guano	.09	.....	$\frac{3}{4}$	2 $\frac{1}{4}$	.89	7.8	4 $\frac{3}{4}$
Grumble	.11	.....	$\frac{1}{2}$	2 $\frac{1}{2}$	1.03	9.4	5
Grudge	.13	.....	$\frac{7}{8}$	2 $\frac{3}{4}$	1.20	11.1	5 $\frac{1}{4}$
Growth	.15	\$0.16	1	3	1.58	14.1	5 $\frac{3}{4}$
Groin	.17 $\frac{1}{2}$	.18 $\frac{1}{2}$	1 $\frac{1}{8}$	3 $\frac{1}{4}$	1.77	16.1	6
Grimace	.19 $\frac{1}{2}$	.21	1 $\frac{1}{8}$	3 $\frac{1}{2}$	2	18	6 $\frac{1}{4}$
Grenade	.22 $\frac{1}{2}$	.24	1 $\frac{1}{8}$	3 $\frac{3}{4}$	2.21	19	7 $\frac{1}{2}$
Gravel	.25	.26 $\frac{1}{2}$	1 $\frac{1}{4}$	4	2.45	23	8
Gratis	.28 $\frac{1}{2}$	.30 $\frac{1}{2}$	1 $\frac{1}{4}$	4 $\frac{1}{4}$	3	26	8 $\frac{1}{2}$
Gross	.31 $\frac{1}{2}$	.33 $\frac{1}{2}$	1 $\frac{1}{4}$	4 $\frac{1}{2}$	3.24	28	9
Grapery	.35	.37	1 $\frac{1}{2}$	4 $\frac{3}{4}$	3.55	30	9 $\frac{1}{2}$
Granite	.38	.40	1 $\frac{1}{2}$	5	4.15	35	10
Grain	.41	.43	1 $\frac{1}{2}$	5 $\frac{1}{4}$	4.42	38	10 $\frac{1}{2}$
Gradate	.44	.46	1 $\frac{3}{4}$	5 $\frac{1}{2}$	4.85	42	11

*These sizes made only 5 strands.

Standard guy ropes are 6x7, and this construction will be shipped unless otherwise specified.

"MAC WHYTE" GALVANIZED CRUCIBLE STEEL YACHT RIGGING AND GUY ROPES

6 STRANDS—7 WIRES OR 19 WIRES IN EACH STRAND—1 HEMP CENTER

		\$0.10	\$0.04 $\frac{1}{4}$	$\frac{5}{16}$	1	.15	3.2	3
Icicle	Jabber			$\frac{5}{16}$	1 $\frac{1}{8}$	.22	4.2	3 $\frac{3}{4}$
Ideal	Jackal	.10 $\frac{1}{4}$	.06	$\frac{1}{4}$	1 $\frac{1}{4}$	.30	5	4 $\frac{1}{4}$
Idiom	Jacket	.11	.07	$\frac{1}{4}$	1 $\frac{1}{2}$	.34	6	4 $\frac{1}{2}$
Idler	Cacabin	.11 $\frac{1}{2}$	.08	$\frac{1}{2}$	1 $\frac{1}{2}$	.39	7	4 $\frac{3}{4}$
Illume	Jaguar	.12	.08 $\frac{3}{4}$	$\frac{1}{2}$	1 $\frac{1}{2}$	.50	9	5 $\frac{1}{4}$
Image	Jasmine	.13	.11	$\frac{1}{2}$	1 $\frac{1}{4}$	.62	11.7	6
Imbibe	Jeopard	.15 $\frac{1}{4}$	.13	$\frac{3}{8}$	2	.89	16.8	7
Imbue	Jester	.20 $\frac{3}{4}$	.18 $\frac{1}{2}$	$\frac{3}{4}$	2 $\frac{1}{4}$	1.03	19	8
Impart	Jewel	.23 $\frac{1}{2}$	.22	$\frac{1}{2}$	2 $\frac{1}{2}$	1.20	22	8 $\frac{1}{2}$
Impeach	Jingle	.26 $\frac{1}{4}$	.24 $\frac{3}{4}$	$\frac{7}{8}$	2 $\frac{3}{4}$	1.58	28	9
Impend	Joiner	.34	.31 $\frac{3}{4}$	1	3	1.77	31	10
Imperial	Joist	.38	.35	1 $\frac{1}{8}$	3 $\frac{1}{4}$	2	34	11
Impetus	Jolly	.41 $\frac{3}{4}$	.39 $\frac{1}{2}$	1 $\frac{1}{8}$	3 $\frac{1}{2}$	2.21	38	12
Implant	Jostle	.46	.44	1 $\frac{1}{8}$	3 $\frac{3}{4}$	2.45	42	13
Implore	Journey	.50	.47	1 $\frac{1}{4}$	4			

"MAC WHYTE" SASH CORDS
COPPER, IRON, TINNED AND GALVANIZED
6 STRANDS—7 WIRES IN EACH STRAND—1 COTTON CENTER
(6 x 7)



FIG. 4623

Diameter in inches	Price per foot			Weight per foot in lbs.		Approximate breaking strain in lbs.		
	Iron	Tinned or Gal. Iron	Copper	Iron	Copper	Iron		Bright Copper
$\frac{1}{16}$	.01 $\frac{1}{4}$	.01 $\frac{3}{4}$	.03	.006	.007	262	132	140
$\frac{3}{32}$	.01 $\frac{1}{2}$	.02	.03 $\frac{1}{2}$	.014	.016	510	280	272
$\frac{1}{8}$	.01 $\frac{3}{4}$	.02 $\frac{1}{4}$	.04 $\frac{1}{2}$	.025	.029	790	467	435
$\frac{5}{16}$	.02 $\frac{1}{4}$	.03	.06	.056	.064	1,417	947	792
$\frac{3}{8}$	.02 $\frac{3}{4}$	.03 $\frac{1}{2}$	.07 $\frac{1}{2}$	.076	.087	1,809	1,254	1,022
$\frac{1}{4}$	.03	.04	.09	.100	.115	2,200	1,600	1,265

"MAC WHYTE" GALVANIZED MAST-ARM OR ARC
LIGHT ROPE

3 STRANDS—4 WIRES IN EACH STRAND—1 COTTON CENTER
(9 x 4)



FIG. 4624

Diameter in inches	Price per Foot	Weight per Foot in lbs.	Approximate Breaking Strain in lbs.
$\frac{1}{4}$	.02 $\frac{3}{4}$	.077	1,125
$\frac{5}{16}$	.03 $\frac{1}{2}$	.107	1,530
$\frac{3}{8}$	.05	.163	2,200
$\frac{7}{16}$	.06	.245	3,400
$\frac{1}{2}$	.07	.335	4,700

$\frac{3}{8}$ -Inch and larger sometimes made 7 wires in each strand.

LOCOMOTIVE SWITCHING, WRECKING AND
BALLAST UNLOADER ROPES

Single Fittings
 Hook and Thimble on One End; Thimble
 and Link on Other End

Double Fittings
 Hook, Thimble and Link on One End;
 Thimble and Two Links on Other End.



FIG. 4625



FIG. 4626

We recommend the use of "Monarch Whyte Strand" for the above ropes. We give below a comparison of breaking strength:

CRUCIBLE CAST STEEL ROPE

Diameter of rope in inches.....	$\frac{3}{4}$	$\frac{7}{8}$	1	1 $\frac{1}{8}$	1 $\frac{1}{4}$	1 $\frac{3}{8}$	1 $\frac{1}{2}$	1 $\frac{5}{8}$	1 $\frac{3}{4}$
Breaking strain in tons.....	17.5	23	30	38	47	56	64	72	85

"MONARCH WHYTE STRAND"

Diameter of rope in inches.....	$\frac{3}{4}$	$\frac{7}{8}$	1	1 $\frac{1}{8}$	1 $\frac{1}{4}$	1 $\frac{3}{8}$	1 $\frac{1}{2}$	1 $\frac{5}{8}$	1 $\frac{3}{4}$
Breaking strain in tons.....	26.3	35	45	56	69	84	98	110	133

Net prices quoted on receipt of specifications.

WIRE ROPE FASTENINGS



FIG. 4627

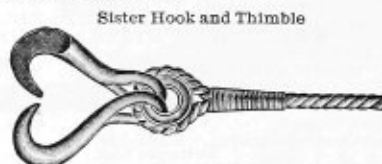


FIG. 4628

HOOKS AND THIMBLES AND SISTER HOOKS AND THIMBLES

Diameter of rope.....inches	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$
Loose, for iron rope.....each	.50	.50	.55	.60	.65	.75	.85
Fastened, for iron rope.....each	1.50	1.50	1.60	1.70	1.80	1.95	2.20
Loose, for steel rope.....each	.65	.65	.70	.75	.80	1.10	1.40
Fastened, for steel rope.....each	1.75	1.75	1.85	1.95	2.05	2.40	2.85

Diameter of rope.....inches	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$
Loose, for iron rope.....each	1.10	1.40	1.90	2.40	2.65	3.40	5.00
Fastened, for iron rope.....each	2.85	3.70	4.65	5.90	6.90	8.65	11.00
Loose, for steel rope.....each	1.85	2.90	3.75	4.40	4.60	5.40	7.00
Fastened, for steel rope.....each	3.75	5.35	6.70	8.15	9.20	11.15	13.50

CLOSED SOCKETS



FIG. 4629

Diameter of rope.....inches	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$
Loose, for iron or steel rope.....each	.70	.70	.85	.85	1.10	1.10	1.35	1.65	1.85
Fastened, for iron or steel rope.....each	1.60	1.60	1.85	2.00	2.25	2.35	2.65	3.15	3.85

Diameter of rope.....inches	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$
Loose, for iron or steel rope.....each	2.40	3.30	4.50	6.00	6.80	12.00	13.00	16.00	21.00
Fastened, for iron or steel rope.....each	4.65	6.15	8.00	10.25	11.80	18.00	21.00	25.50	32.00

OPEN SOCKETS



FIG. 4630

Diameter of rope.....inches	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$
Loose, for iron or steel rope.....each	.85	.85	1.00	1.00	1.35	1.35	1.65	2.10	2.50
Fastened, for iron or steel rope.....each	1.75	1.75	2.00	2.15	2.50	2.60	2.95	3.60	4.50

Diameter of rope.....inches	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$
Loose, for iron or steel rope.....each	3.15	4.50	6.10	7.50	8.00	13.00	15.50	16.50	23.00
Fastened, for iron or steel rope.....each	5.40	7.35	9.60	11.75	13.00	19.00	23.50	26.00	34.00

WIRE ROPE FASTENINGS—CONTINUED

Hook and Socket



FIG. 4631

Swivel Hook and Socket



FIG. 4632

HOOKS AND SOCKETS

Diameter of rope.....inches	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$
Price, loose, for iron rope....each	\$1.25	\$1.25	\$1.50	\$1.55	\$1.95	\$2.00	\$2.30
Price, fastened, for iron rope..each	2.15	2.15	2.50	2.70	3.10	3.25	3.60
Price, loose, for steel rope....each	1.45	1.45	1.65	1.70	2.10	2.45	2.90
Price, fastened, for steel rope..each	2.35	2.35	2.65	2.85	3.25	3.70	4.20
Diameter of rope.....inches	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$
Price, loose, for iron rope....each	3.00	3.70	4.60	6.25	8.00	10.25	12.50
Price, fastened, for iron rope..each	4.50	5.70	6.85	9.10	11.50	14.50	17.50
Price, loose, for steel rope....each	3.85	5.25	6.50	8.25	10.00	12.30	14.50
Price, fastened, for steel rope..each	5.35	7.25	8.75	11.10	13.50	16.55	19.50

SWIVEL HOOKS AND SOCKETS

Diameter of rope.....inches	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$
Price, loose, for iron rope....each	\$2.00	\$2.00	\$2.35	\$2.55	\$3.00	\$3.00	\$3.60
*Price, fastened, for iron rope..each	2.90	2.90	3.35	3.70	4.15	4.25	4.90
Price, loose, for steel rope....each	2.30	2.30	2.70	2.85	3.55	3.75	4.60
Price, fastened, for steel rope..each	3.20	3.20	3.70	4.00	4.70	5.00	5.90
Diameter of rope.....inches	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$
Price, loose, for iron rope....each	4.00	4.75	5.70	9.00	13.50	17.00	22.00
Price, fastened, for iron rope..each	5.50	6.75	7.95	11.85	17.00	21.25	27.00
Price, loose, for steel rope....each	5.25	7.00	8.35	12.00	17.00	21.00	27.00
Price, fastened, for steel rope..each	6.75	9.00	10.60	14.85	20.50	25.25	32.00

WIRE ROPE FASTENINGS—CONTINUED

THIMBLES SPICED ON ROPE



FIG. 4633

Diameter of rope.....inches	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$
Price, for iron rope.....each	\$1.00	1.00	1.05	1.10	1.15	1.20	1.45
Price, for steel rope.....each	\$1.10	1.10	1.15	1.20	1.25	1.30	1.55
Diameter of rope.....inches	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$
Price, for iron rope.....each	\$1.85	2.40	2.85	3.65	4.35	5.25	6.00
Price, for steel rope.....each	\$2.00	2.55	3.00	3.90	4.70	5.75	6.50

HEAVY GALVANIZED OVAL THIMBLES



FIG. 4634

Circumference of rope.....inches	$\frac{3}{4}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2
Width, score.....inches	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$
Price.....each	\$0.08	.08	.09	.10	.11	.12	.13
Circumference of rope.....inches	$2\frac{1}{4}$	$2\frac{3}{4}$	3	$3\frac{1}{2}$	4	$4\frac{1}{4}$	$4\frac{3}{4}$
Width, score.....inches	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$
Price.....each	\$0.15	.16	.20	.25	.33	.42	.50

MOCKBEE WIRE ROPE CLIPS



FIG. 4635

PRICES MOCKBEE CLIPS

Size	inches	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	
Price	each	\$0.35	.35	.35	.40	.45	.45	.55	.55	.65	.75	.85

Size	inches	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3
Price	each	\$0.95	1.10	1.25	1.50	3.50	5.50	7.50	9.50	11.50	25.00	35.00

THE GENUINE CROSBY CLIP

IS THE SAFEST AND BEST WIRE ROPE CLIP TO USE AND
ASSURES POSITIVE SAFETY

THE ONLY DROP FORGED GALVANIZED CLIP MADE

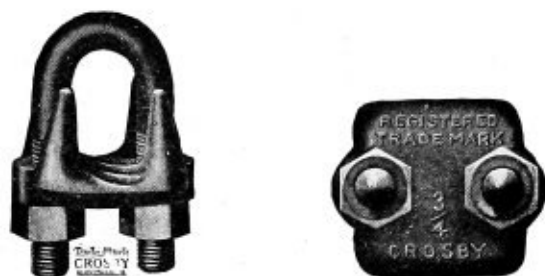


FIG. 4636

* GENUINE "CROSBY" DIE FORGED—CANNOT BREAK



FIG. 4637

Diameter of Rope	List Price Each	Diameter of Rope	List Price Each
$\frac{1}{4}$ in.	\$0.35	$1\frac{1}{4}$ in.	\$1.10
$\frac{1}{2}$ in.	.35	$1\frac{3}{8}$ in.	1.25
$\frac{3}{8}$ in.	.40	$1\frac{1}{2}$ in.	1.50
$\frac{7}{16}$ in.	.45	$1\frac{5}{8}$ in.	3.50
$\frac{1}{2}$ in.	.45	$1\frac{3}{4}$ in.	5.50
$\frac{9}{16}$ in.	.55	2 in.	7.50
$\frac{3}{4}$ in.	.65	$2\frac{1}{4}$ in.	9.50
$\frac{7}{8}$ in.	.75	$2\frac{1}{2}$ in.	11.50
1 in.	.85	$2\frac{3}{4}$ in.	25.00
$1\frac{1}{8}$ in.	.95	3 in.	35.00

REGULAR INSIDE IRON STRAPPED BLOCKS LOOSE SIDE HOOKS



FIG. 4638



FIG. 4639



FIG. 4640

Dimensions			Iron Bushed			Improved Roller Bushed		
Size Sheave, Inches	For dia. Rope, Inches	Length Shell, Inches	Single, Each	Double, Each	Triple, Each	Single, Each	Double, Each *	Triple, Each
1 3/4 x 1 1/2 x 3/8	3/8	3	\$ 0 70	\$ 1 30	\$ 1 75	\$ 1 10	\$ 2 00	\$ 2 90
2 x 1 1/2 x 3/8	3/8	3 1/2	75	1 45	2 00	1 15	2 20	3 15
2 1/4 x 1 1/2 x 3/8	1/2	4	85	1 60	2 15	1 20	2 25	3 25
3 x 1 1/2 x 3/8	5/8	5	90	1 75	2 25	1 25	2 35	3 50
3 1/2 x 1 1/2 x 3/8	3/4	6	1 10	2 00	2 90	1 50	2 85	4 40
4 1/4 x 1 1/2 x 3/8	7/8	7	1 30	2 40	3 50	1 70	3 35	5 00
4 3/4 x 1 1/2 x 5/8	1	8	1 65	2 85	4 25	2 25	4 15	6 00
5 1/2 x 1 1/2 x 5/8	1	9	1 85	3 40	4 75	2 50	4 70	7 25
6 1/4 x 1 1/2 x 5/8	1 1/8	10	2 75	4 50	6 25	3 50	6 00	8 50
7 1/4 x 1 1/2 x 3/4	1 1/8	11	4 45	7 50	10 65	5 30	9 20	13 20
8 x 1 1/2 x 3/4	1 1/4	12	4 45	7 50	10 65	5 30	9 20	13 20
9 x 1 1/2 x 3/4	1 1/4	13	7 00	10 50	15 00	8 15	12 80	18 45
9 1/2 x 1 1/2 x 3/4	1 1/2	14	7 00	10 50	15 00	8 15	12 80	18 45
10 x 1 1/2 x 3/4	1 1/2	15	8 00	13 00	18 00	9 25	15 50	21 75
11 x 1 1/2 x 3/4	1 1/2	16	10 00	15 00	22 00	11 50	18 00	26 50

We furnish becketts in all single, one-half double and one-third triple blocks, without charge.

ANVIL BRAND INSIDE IRON STRAPPED BLOCKS WITH LOOSE SWIVEL HOOKS

No. 499—Single



FIG. 4641

No. 497—Double



FIG. 4642

No. 498—Triple



FIG. 4643

DIMENSIONS			IRON BUSHED			IMPROVED ROLLER BUSHED		
Size Sheave, inches	For Dia. Rope, inches	Length Shell, inches	Single, each	Double, each	Triple, each	Single, each	Double, each	Triple, each
1 3/4 x 1 1/2 x 3/4	3/4	3	\$ 1.20	\$ 1.80	\$ 2.25	\$ 1.60	\$ 2.50	\$ 3.40
2 x 1 1/2 x 3/4	3/4	3 1/2	1.25	1.95	2.50	1.65	2.70	3.65
2 1/4 x 1 1/2 x 3/4	1/2	4	1.35	2.10	2.65	1.70	2.75	3.75
3 x 1 1/2 x 3/4	5/8	5	1.40	2.25	2.75	1.75	2.85	4.00
3 1/2 x 1 1/2 x 3/4	3/4	6	1.60	2.50	3.50	2.00	3.35	5.00
4 1/4 x 1 1/2 x 3/4	3/4	7	1.80	3.00	4.25	2.20	3.95	5.75
4 3/4 x 1 1/2 x 3/4	1	8	2.25	3.60	5.15	2.85	4.90	6.90
5 1/2 x 1 1/2 x 3/4	1	9	2.60	4.30	5.95	3.25	5.60	8.45
6 1/4 x 1 1/2 x 3/4	1 1/4	10	3.65	5.70	8.00	4.40	7.20	10.25
7 1/4 x 1 1/2 x 3/4	1 1/4	11	5.65	9.25	13.15	6.50	10.95	15.70
8 x 1 1/2 x 3/4	1 1/4	12	5.65	9.25	13.15	6.50	10.95	15.70
9 x 1 1/2 x 3/4	1 1/4	13	9.50	13.50	18.50	10.65	15.80	21.95
9 1/2 x 1 1/2 x 3/4	1 3/4	14	9.50	13.50	18.50	10.65	15.80	21.95
10 x 1 1/2 x 3/4	1 1/2	15	11.00	16.50	22.50	12.25	19.00	26.25
11 x 1 1/4 x 3/4	1 1/2	16	13.50	21.00	30.00	15.00	24.00	34.50

PHOSPHOR BRONZE BUSHED, SELF-LUBRICATING				METALINE BUSHED, SELF-LUBRICATING			
Length Shell, inches	Single, each	Double, each	Triple, each	Length Shell, inches	Single, each	Double, each	Triple, each
4	\$2.00	\$3.40	\$ 4.65	11	\$ 7.95	\$14.25	\$21.00
5	2.25	3.85	5.25	12	7.95	14.25	21.00
6	2.70	4.50	6.40	13	12.25	20.00	28.50
7	3.00	5.10	7.45	14	12.25	20.00	28.50
8	3.85	6.45	9.40	15	14.00	23.00	33.00
9	4.45	7.65	11.20	16	17.50	30.00	42.00
10	5.65	9.70	14.25				

We furnish becketts in all single, one-half double and one-third triple blocks, without charge.

ANVIL BRAND HEAVY TACKLE THICK MORTISE BLOCKS

With Extra Heavy Loose Side Hooks and Straps. Double Cross Bolted Shells.
Fitted with Shackles when so preferred.

No. 549
Single.



FIG. 4644

No. 550
Double.



FIG. 4645

No. 551
Triple.



FIG. 4646

Dimensions			Iron Bushed			Improved Roller Bushed		
Size Sheave, Inches	For Dia. Rope, Inches	Length Shell, Inches	Single, Each	Double, Each	Triple, Each	Single, Each	Double, Each	Triple, Each
4 x 1 1/8 x 1 1/2	1	7	\$ 2 25	\$ 4 00	\$ 5 50	\$ 3 00	\$ 5 50	\$ 7 75
4 3/4 x 1 3/8 x 5/8	1 1/8	8	2 75	4 50	6 30	3 50	6 00	8 55
5 1/2 x 1 3/8 x 5/8	1 1/8	9	3 15	5 25	7 25	4 00	6 95	9 80
6 1/4 x 1 1/2 x 3/4	1 1/4	10	4 00	6 50	8 50	5 25	9 00	12 25
7 x 1 1/2 x 3/4	1 1/4	11	5 25	8 50	12 50	6 50	11 00	16 25
8 x 1 3/8 x 3/4	1 1/2	12	5 25	8 50	12 50	6 50	11 00	16 25
9 x 1 3/4 x 3/4	1 1/2	13	8 00	13 00	17 00	9 75	16 50	22 25
9 1/2 x 1 3/8 x 3/4	1 3/4	14	8 00	13 00	17 00	9 75	16 50	22 25
10 x 1 7/8 x 7/8	1 3/4	15	9 00	15 00	20 00	11 00	19 00	26 00
11 x 2 1/4 x 1	2	16	11 50	18 00	28 00	14 00	23 00	35 50

PHOSPHOR BRONZE OR METALINE BUSHED, SELF-LUBRICATING

Length Shell, Inches	Single, Each	Double, Each	Triple, Each	Length Shell, Inches	Single, Each	Double, Each	Triple, Each
7	\$ 4 25	\$ 7 50	\$10 00	12	\$ 9 25	\$17 00	\$25 00
8	5 00	9 00	13 00	13	13 00	23 50	33 00
9	5 75	10 50	15 00	14	13 00	23 50	33 00
10	7 25	13 50	19 00	15	15 00	26 50	37 00
11	9 25	17 00	25 00	16	18 00	32 00	48 00

These blocks are adapted for railroads, mining, bridge building and contractors' work.

ANVIL BRAND HEAVY TACKLE THICK MORTISE BLOCKS

LOOSE SWIVEL HOOKS

No. 561, Single



FIG. 4647

No. 562, Double



FIG. 4648

No. 563, Triple



FIG. 4649

DIMENSIONS			IRON BUSHED			IMPROVED ROLLER BUSHED		
Size Sheave, inches	For Dia. Rope, inches	Length Shell, inches	Single, each	Double, each	Triple, each	Single, each	Double, each	Triple, each
4 x 1 1/4 x 1 1/2	1	7	\$ 2.85	\$ 4.75	\$ 6.40	\$ 3.60	\$ 6.25	\$ 8.65
4 3/4 x 1 3/8 x 3/4	1 1/8	8	3.50	5.40	7.50	4.25	6.90	9.75
5 1/2 x 1 3/8 x 3/4	1 1/8	9	4.05	6.45	9.00	4.90	8.15	11.55
6 1/4 x 1 1/2 x 3/4	1 1/4	10	5.20	8.25	11.00	6.45	10.75	14.75
7 x 1 1/2 x 3/4	1 1/4	11	7.75	11.50	15.75	9.90	14.00	19.50
8 x 1 5/8 x 3/4	1 1/2	12	7.75	11.50	15.75	9.90	14.00	19.50
9 x 1 3/4 x 3/4	1 1/2	13	11.25	16.50	21.50	13.00	20.00	26.75
9 1/2 x 1 7/8 x 3/4	1 3/4	14	11.25	16.50	21.50	13.00	20.00	26.75
10 x 1 7/8 x 3/4	1 3/4	15	12.50	19.50	26.00	14.50	23.50	32.00
11 x 2 1/4 x 1	2	16	16.00	24.00	36.00	18.50	29.00	43.50

DIMENSIONS			SELF-ADJUSTING FIVE-ROLLER BUSHED			PHOSPHOR BRONZE OR METALINE BUSHED, SELF- LUBRICATING		
Size Sheave, inches	For Dia. Rope, inches	Size Shell, inches	Single, each	Double, each	Triple, each	Single, each	Double, each	Triple, each
4 x 1 1/4 x 1 1/2	1	7	\$3.60	\$6.25	\$8.65	\$5.10	\$8.75	\$12.40
4 3/4 x 1 3/8 x 3/4	1 1/8	8	4.25	6.90	9.75	5.75	9.90	14.20
5 1/2 x 1 3/8 x 3/4	1 1/8	9	4.90	8.15	11.55	6.65	11.70	16.75
6 1/4 x 1 1/2 x 3/4	1 1/4	10	6.45	10.75	14.75	8.45	15.25	21.50
7 x 1 1/2 x 3/4	1 1/4	11	9.00	14.00	19.50	11.75	20.00	28.25
8 x 1 5/8 x 3/4	1 1/2	12	9.00	14.00	19.50	11.75	20.00	28.25
9 x 1 3/4 x 3/4	1 1/2	13	13.00	20.00	26.75	16.25	27.00	37.50
9 1/2 x 1 7/8 x 3/4	1 3/4	14	13.00	20.00	26.75	16.25	27.00	37.50
10 x 1 7/8 x 3/4	1 3/4	15	14.50	23.50	32.00	18.50	31.00	43.00
11 x 2 1/4 x 1	2	16	18.50	29.00	43.50	22.50	38.00	56.00

ANVIL BRAND EXTRA HEAVY IRON STRAPPED BLOCKS

HARCOURT'S PATENT

FOR RAILROAD WRECKING CARS AND STEAMBOAT USE WITH LASHING SHACKLES

No. 567 Double



FIG. 4650

No. 568 Triple

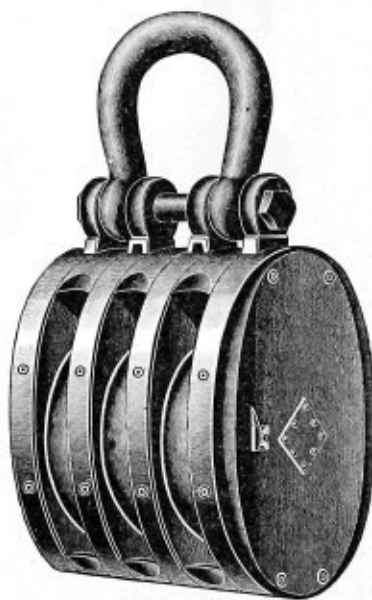


FIG. 4651

DIMENSIONS			IRON BUSHED			IMPROVED ROLLER BUSHED		
Size Sheave, inches	For Diam. Rope, inches	Length Shell, inches	Single, each	Double, each	Triple, each	Single, each	Double, each	Triple, each
12 x 2 1/2 x 1 1/2	2 1/2	18	15.00	29.00	42.00	18.00	35.00	52.00
14 x 2 1/2 x 1 1/2	2 1/2	20	21.00	37.00	54.00	25.00	45.00	65.00
15 x 2 1/2 x 1 1/2	3	22	26.00	48.00	70.00	35.00	65.00	95.00
16 x 3 1/2 x 1 1/2	3 1/2	24	32.00	56.00	84.00	45.00	80.00	120.00

PHOSPHOR BRONZE OR METALINE SELF-LUBRICATING BUSHED

Length Shell..... Inches	18	20	22	24
Single.....each	23.00	32.00	38.00	46.00
Double.....each	44.00	54.00	70.00	85.00
Triple.....each	63.00	77.00	100.00	125.00

Above blocks fitted with Rings or Loose Hooks when so preferred.

These Extra Heavy Blocks are made throughout in the best possible manner. Every detail, from the selection of the materials to the workmanship and finish, has been given the most careful attention.

STEEL TACKLE BLOCKS

WITH LOOSE SIDE HOORS

No. 571—Single



FIG. 4652

No. 572—Double



FIG. 4653

No. 573—Triple

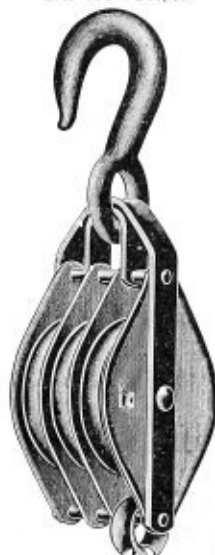


FIG. 4654

They are lighter than wood blocks and equally strong. As there is no danger of shells splitting, they are more durable. Shells have nicely rounded edges to protect rope.

DIMENSIONS			IRON BUSHED			IMPROVED ROLLER BUSHED			PHOSPHOR BRONZE OR METALINE BUSHED, SELF-LUBRICATING		
Dia. Sheaves, inches	For Dia. Rope, inches	Length Shell, inches	Single, each	Double, each	Triple, each	Single, each	Double, each	Triple, each	Single, each	Double, each	Triple, each
1¾	¾	3	\$0.70	\$1.30	\$ 1.75	\$1.10	\$ 2.00	\$ 2.90	.....	.....	.....
2¼	1½	4	.85	1.60	2.15	1.20	2.25	3.25	\$1.50	\$ 2.90	\$ 4.15
3	¾	5	.90	1.75	2.25	1.25	2.35	3.50	1.75	3.35	4.75
3½	¾	6	1.10	2.00	2.90	1.50	2.85	4.40	2.20	4.00	5.80
4¼	¾	7	1.30	2.40	3.50	1.70	3.35	5.00	2.50	4.50	6.70
4¾	1	8	1.65	2.85	4.25	2.25	4.15	6.00	3.25	5.70	8.50
5½	1	9	1.85	3.40	4.75	2.50	4.70	7.25	3.70	6.75	10.00
6¼	1½	10	2.75	4.50	6.25	3.50	6.00	8.50	4.75	8.50	12.50
8	1½	12	5.00	8.25	11.75	6.00	10.35	14.90	6.45	11.15	16.00

ANVIL BRAND PERFECT METAL BLOCKS

No. 583

No. 584

No. 585



FIG. 4655



FIG. 4656



FIG. 4657

DIMENSIONS			IRON BUSHED			IMPROVED ROLLER BUSHED		
Size Sheave, Inches	For Dia. Rope, Inches	Length Shell, Inches	Single, Each	Double, Each	Triple, Each	Single, Each	Double, Each	Triple, Each
1 3/4 x 1 1/2 x 3/8	3/8	3	\$0.70	\$1.30	\$1.75	\$1.10	\$2.00	\$2.90
2 1/4 x 5/8 x 3/8	1/2	4	.85	1.60	2.15	1.20	2.25	3.25
3 x 3/4 x 3/8	5/8	5	.90	1.75	2.25	1.25	2.35	3.50
3 1/2 x 1 x 1/2	3/4	6	1.10	2.00	2.90	1.50	2.85	4.40
4 1/4 x 1 x 1/2	7/8	7	1.30	2.40	3.50	1.70	3.35	5.00
4 3/4 x 1 1/4 x 5/8	1	8	1.65	2.85	4.25	2.25	4.15	6.00
5 1/2 x 1 3/8 x 5/8	1 1/8	9	1.85	3.40	4.75	2.50	4.70	7.25
6 1/4 x 1 1/2 x 3/4	1 1/4	10	2.75	4.50	6.25	3.50	6.00	8.50
7 1/2 x 1 5/8 x 3/4	1 3/8	12	4.45	7.50	10.65	5.30	9.20	13.20
8 1/2 x 1 7/8 x 7/8	1 1/2	14	7.00	10.50	15.00	8.15	12.80	18.45

DIMENSIONS			SELF-LUBRICATING, IRON BUSHED			Phosphor Bronze Bushed, Self-Lubricating		
Size Sheave, Inches	For Dia. Rope, Inches	Length Shell, Inches	Single, Each	Double, Each	Triple, Each	Single, Each	Double, Each	Triple, Each
1 3/4 x 1 1/2 x 3/8	3/8	3	\$0.70	\$1.30	\$1.75	.....	.....	.....
2 1/4 x 5/8 x 3/8	1/2	4	.85	1.60	2.15	\$1.50	\$2.00	\$4.15
3 x 3/4 x 3/8	5/8	5	.90	1.75	2.25	1.75	3.35	4.75
3 1/2 x 1 x 1/2	3/4	6	1.10	2.00	2.90	2.20	4.00	5.80
4 1/4 x 1 x 1/2	7/8	7	1.30	2.40	3.50	2.50	4.50	6.70
4 3/4 x 1 1/4 x 5/8	1	8	1.65	2.85	4.25	3.25	5.70	8.50
5 1/2 x 1 3/8 x 5/8	1 1/8	9	1.85	3.40	4.75	3.70	6.75	10.00
6 1/4 x 1 1/2 x 3/4	1 1/4	10	2.75	4.50	6.25	4.75	8.50	12.50
7 1/2 x 1 5/8 x 3/4	1 3/8	12	4.45	7.50	10.65	6.75	12.50	18.50
8 1/2 x 1 7/8 x 7/8	1 1/2	14	7.00	10.50	15.00	9.75	17.00	25.00

Above blocks furnished with shackles at a reasonable advance.

Five-Roll Roller Bushed Blocks quoted upon application. Use above "Improved Roller Bushed" list for same.

CLEVELAND NEW STYLE PATENT AUTOMATIC SNATCH BLOCK



FIG. 4658

Length of Shell	Size of Sheave	Diameter of Rope	Price Plain Bushed	No.
7 in.	3½ x 1¼	¾ to 7⁄8	\$4.75	200
8 in.	4 x 1½	1 to 1¼	5.75	202
10 in.	5½ x 1¾	1¼ to 1½	8.50	204

DETROIT PATENT "SURE GRIP" STEEL TACKLE BLOCK

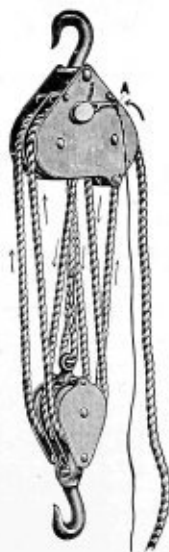


FIG. 4659

Will hold load at any point without fastening the rope. The heavier the load the better the grip. The brake is absolutely automatic and reliable.

They are the best and cheapest, because the same amount of money invested in ordinary tackle blocks will not begin to give the same amount of service.

The price of the "SURE GRIP" is practically nothing over the ordinary block of same quality.

No. 3.	For ¾ in. rope, capacity 600 lbs., 1 man can lift 300 lbs.	\$ 3.00
No. 4.	For ½ in. rope, capacity 1,000 lbs., 1 man can lift 350 lbs.	5.50
No. 5.	For 5⁄8 in. rope, capacity 1,800 lbs., 1 man can lift 400 lbs.	7.00
No. 6.	For ¾ in. rope, capacity 2,500 lbs., 1 man can lift 450 lbs.	8.50
No. 4½.	For ½ in. rope, capacity 3,000 lbs., 1 man can lift 600 lbs.	10.00
No. 5½.	For 5⁄8 in. rope, capacity 3,500 lbs., 1 man can lift 700 lbs.	12.00
No. 6½.	For ¾ in. rope, capacity 5,000 lbs., 1 man can lift 850 lbs.	14.00

ANVIL BRAND SNATCH BLOCKS

WOOD SHELL

STEEL SHELL

No. 603
Drop Link

FIG. 4660

No. 604
Self-Locking

FIG. 4661

No. 607
Drop Link

FIG. 4662

No. 608
Self-Locking

FIG. 4663

Drop Forged Heads and Links

Size Sheave, inches	For Dia. Rope, inches	Length Shell, inches	Iron Bushed, each	Improved Roller Bushed, each	Phosphor Bronze or Metalline Bushed, each
3 x 1 1/8 x 1 1/2	3/8	6	\$ 4.00	\$ 4.65	\$ 5.25
3 1/2 x 1 1/4 x 1 1/2	7/8	7	4.75	5.50	6.00
4 1/2 x 1 3/8 x 1 1/2	1	8	5.75	6.60	7.25
5 x 1 3/8 x 1 1/2	1 1/8	9	6.75	7.75	8.50
5 3/4 x 1 7/8 x 1 1/2	1 1/4	10	8.50	10.00	11.00
6 3/4 x 2 1/8 x 1 1/2	1 3/8	12	10.00	11.50	13.00
8 x 2 1/4 x 1 1/2	1 3/4	14	13.00	15.00	16.50
9 x 2 5/8 x 1	2	16	17.00	20.00	22.00
10 x 3 x 1 1/2	2 1/4	18	25.00	28.50	31.00
11 x 3 1/2 x 1 1/4	2 1/2	20	38.00	43.00	46.00
11 3/4 x 4 1/4 x 1 1/2	3	22	55.00	63.00	68.00
12 1/2 x 4 1/2 x 1 1/2	3 1/2	24	70.00	78.00	86.00
14 x 4 3/4 x 1 3/4	4	26	90.00	.....	110.00

ANVIL BRAND IMPROVED METAL SNATCH BLOCKS

No. 611
Closed



FIG. 4664

No. 612
Open



FIG. 4665

This block has the safest and most easily operated locking device of any on the market. There are no springs of any kind employed as they weaken by use and are often lost from blocks in handling, and thus the efficiency of the most important part of the block is destroyed. Our block cannot be unlocked accidentally.

Both sides of shell are same length—the inner surfaces being perfectly smooth and the outer edges being well rounded, there are no sharp or uneven points of contact to chafe the rope.

The sheave has a bearing at hub only and, as the edges cannot wear against side of block, the groove of sheave is kept perfect for the rope.

Hooks are one size larger than on regular steel snatch.

Sheaves are interchangeable with any of our other snatch blocks for manila rope.

Blocks furnished with flatted hooks when so ordered.

Size Sheave, Inches	For Diam. Rope, Inches	Length Shell, Inches	Self-Lubricating Iron Bushed, Each	Improved Roll- er Bushed, Each	Phosphor Bronze or Met- aline Bushed, Each
3 x 1½ x ½	¾	6	\$4.50	\$5.15	\$5.75
3½ x 1¼ x ½	¾	7	5.50	6.25	6.75
4½ x 1¾ x ¾	1	8	6.50	7.35	8.00
5¾ x 1½ x ¾	1¼	10	10.00	11.50	12.50
6¾ x 2½ x ¾	1½	12	12.50	14.00	15.50
8 x 2¼ x ¾	1¾	14	16.00	18.00	19.50
9 x 2¾ x 1	2	16	21.00	24.00	26.00

ANVIL BRAND EXTRA HEAVY OUTSIDE IRON STRAPPED SNATCH BLOCKS

No. 614,
Wood Shell



FIG. 4666

Flattened swivel hooks. Phosphor bronze, self-lubricating bushed. Favorite with bridge builders and general contractors.

Sheave, inches	Dia. Rope, inches	Shell, inches	Price, each
4 1/4 x 1 x 5/8	3/4	10	\$8.55
5 x 1 1/4 x 3/4	1	11	9.35
5 x 1 1/2 x 7/8	1 1/4	12	9.75
6 1/2 x 1 3/4 x 1	1 1/2	14	12.00
7 1/4 x 2 x 1 1/8	1 3/4	15 1/2	17.50
8 x 2 1/2 x 1 1/4	2	16 1/2	19.00
9 x 3 x 1 1/2	2 1/2	18	24.00
10 x 3 1/2 x 1 3/4	3	21	35.00

WROUGHT IRON GIN BLOCKS FOR MANILA ROPE

No. 600,
With Swivel Hooks

Diameter Sheave.....inches	6	7	8	9	10	11
For Diameter Rope.....inches	1	1	1	1	1	1
Price, Iron Bushed .....each	\$3.15	3.50	3.85	4.20	4.55	5.25
Price, Roller Bushed .....each	4.00	4.40	4.70	5.40	5.75	6.55
Price, Self-Lubricating .....each	4.75	5.15	5.50	6.20	6.55	7.35

Diameter Sheave .....inches	12	14	16	18	20
For Diameter Rope.....inches	1	1 1/4	1 1/2	1 3/4	2
Price, Iron Bushed .....each	\$5.80	6.30	8.40	9.80	11.90
Price, Roller Bushed .....each	7.10	7.60	9.70	11.10	13.00
Price, Self-Lubricating .....each	7.90	8.50	10.70	12.10	14.00

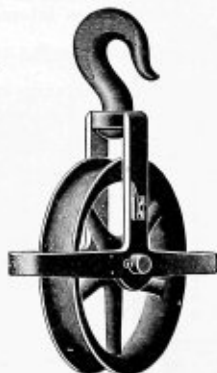


FIG. 4667

ANVIL BRAND WIRE ROPE BLOCKS

No. 678

No. 684

No. 682

WIRE ROPE SNATCH

No. 722

No. 723



FIG. 4668



FIG. 4669



FIG. 4670



FIG. 4671



FIG. 4672

Dimensions		Iron Bushed			Phosphor Bronze or Metaline Self-Lub. Bushed		
Diam. of Sheave, Inches	For Diam. Rope, Inches	Single, Each	Double, Each	Triple, Each	Single, Each	Double, Each	Triple, Each
8	$\frac{1}{2}$	\$ 6.00	\$11.00	\$14.00	\$ 9.00	\$17.00	\$22.00
10	$\frac{3}{4}$	8.00	13.00	16.00	11.00	19.00	24.00
12	$\frac{7}{8}$	10.00	15.00	20.00	13.00	21.00	28.00
14	$\frac{1}{2}$	12.00	17.00	23.00	15.00	23.00	31.00
16	$\frac{3}{4}$	14.00	19.00	26.00	17.00	25.00	34.00
18	$\frac{7}{8}$	21.50	31.00	39.50	25.00	38.00	50.00

No. 689

Diam. of Sheave, Inches	For Diam. Rope, Inches	Iron Bushed, Each	Phos. Br. or Met. Self-Lub. Each
8	$\frac{1}{2}$	\$11.00	\$12.00
10	$\frac{3}{4}$	14.00	15.00
12	$\frac{7}{8}$	16.00	18.00
14	$\frac{1}{2}$	20.00	24.00
16	$\frac{3}{4}$	28.00	32.00
18	1	38.00	44.00
20	$1\frac{1}{4}$	50.00	58.00
22	$1\frac{1}{2}$	70.00	78.00

No. 693

No. 695

EXTRA HEAVY WIRE ROPE BLOCKS

Note double plates in the middles and that the center straps in the double and triple extend full length of the shell, giving proper support for center pin in middle block.



FIG. 4673



FIG. 4674



FIG. 4675

Dimensions		Iron Bushed			Phosphor Bronze or Metaline Self-Lubricating Bushed		
Diam. of Sheave, Inches	For Diam. Rope, Inches	Single, Each	Double, Each	Triple, Each	Single, Each	Double, Each	Triple, Each
8	$\frac{1}{2}$	\$11.00	\$16.00	\$22.50	\$14.00	\$22.00	\$32.00
10	$\frac{3}{4}$	14.00	20.00	28.00	17.00	26.00	37.00
12	$\frac{7}{8}$	16.00	23.00	31.00	19.00	29.00	41.00
14	$\frac{1}{2}$	18.00	25.00	36.00	21.00	31.00	45.00
16	$\frac{3}{4}$	21.00	40.00	46.00	26.00	50.00	72.00
18	1	34.50	45.00	60.00	40.00	56.00	78.00

ANVIL BRAND SHEAVES FOR WIRE ROPE



FIG. 4676

Dimensions			Prices	
Size of Sheave	Thickness at Hub	For Diameter Wire	Iron Bushed	Phosphor Bronze or Metaline Bushed
REGULAR PATTERN				
6x1 x $\frac{3}{4}$	1 $\frac{1}{4}$	$\frac{3}{8}$	\$0.75	\$2.00
8x1 $\frac{1}{4}$ x $\frac{3}{4}$	1 $\frac{3}{8}$	$\frac{1}{2}$	1.40	2.90
10x1 $\frac{1}{4}$ x $\frac{7}{8}$	1 $\frac{1}{2}$	$\frac{5}{8}$	2.50	3.75
12x1 $\frac{1}{2}$ x 1	1 $\frac{5}{8}$	$\frac{3}{4}$	3.50	5.50
14x1 $\frac{1}{2}$ x 1 $\frac{1}{4}$	1 $\frac{7}{8}$	$\frac{3}{4}$	4.45	6.90
16x1 $\frac{3}{4}$ x 1 $\frac{1}{4}$	2	$\frac{7}{8}$	7.00	8.75

EXTRA HEAVY PATTERN

8x1 $\frac{1}{4}$ x $\frac{7}{8}$	1 $\frac{3}{8}$	$\frac{1}{2}$	\$1.25	\$3.25
10x1 $\frac{1}{4}$ x 1	1 $\frac{1}{2}$	$\frac{5}{8}$	2.65	4.00
12x1 $\frac{1}{2}$ x 1 $\frac{1}{8}$	1 $\frac{5}{8}$	$\frac{3}{4}$	3.25	6.00
14x1 $\frac{1}{2}$ x 1 $\frac{1}{4}$	1 $\frac{7}{8}$	$\frac{3}{4}$	4.20	7.75
16x1 $\frac{3}{4}$ x 1 $\frac{1}{2}$	2	$\frac{7}{8}$	6.50	9.00
18x1 $\frac{3}{4}$ x 1 $\frac{1}{2}$	2	1	7.85	10.90

SHEAVES FOR MANILA ROPE

Size of Sheave	For Block, Inches, Thick Mort	Iron Bushed	Roller Bushed	Phos. Bronze Bushed
1 $\frac{3}{4}$ x 1 $\frac{1}{2}$ x $\frac{3}{8}$	3	\$0.09	\$0.40	.....
2 x 1 $\frac{1}{2}$ x $\frac{3}{8}$	3 $\frac{1}{2}$	.10	.42	\$0.60
2 $\frac{1}{4}$ x $\frac{5}{8}$ x $\frac{3}{8}$	4	.12	.45	.70
2 $\frac{3}{4}$ x $\frac{3}{4}$ x $\frac{3}{8}$	4 $\frac{1}{2}$	.15	.50	.80
3 x $\frac{3}{4}$ x $\frac{3}{8}$	5	.20	.55	.90
3 $\frac{1}{2}$ x 1 x 1 $\frac{1}{2}$	6	.25	.65	1.40
4 $\frac{1}{4}$ x 1 x 1 $\frac{1}{2}$	7	.30	.75	1.50
4 $\frac{3}{4}$ x 1 $\frac{1}{4}$ x $\frac{5}{8}$	8	.35	1.00	1.85
4 $\frac{3}{4}$ x 1 $\frac{3}{8}$ x $\frac{5}{8}$	8	.40	1.15	2.00
5 $\frac{1}{2}$ x 1 $\frac{1}{8}$ x $\frac{5}{8}$	9	.45	1.10	1.95
5 $\frac{1}{2}$ x 1 $\frac{3}{8}$ x $\frac{5}{8}$	9	.50	1.25	2.10
6 $\frac{1}{4}$ x 1 $\frac{1}{4}$ x $\frac{5}{8}$	10	.55	1.35	2.25
6 $\frac{1}{4}$ x 1 $\frac{1}{2}$ x $\frac{3}{4}$	10	.65	1.60	2.75
7 $\frac{1}{4}$ x 1 $\frac{1}{4}$ x $\frac{3}{4}$	11	.70	1.65	2.60
7 x 1 $\frac{1}{2}$ x $\frac{3}{4}$	11	.85	1.80	2.95
8 x 1 $\frac{3}{8}$ x $\frac{3}{4}$	12	.90	1.90	2.95
8 x 1 $\frac{1}{2}$ x $\frac{3}{4}$	12	1.05	2.10	3.25
9 x 1 $\frac{1}{2}$ x $\frac{3}{4}$	13	1.20	2.40	3.25
9 x 1 $\frac{3}{4}$ x $\frac{3}{4}$	13	1.35	2.55	3.45
9 $\frac{1}{2}$ x 1 $\frac{3}{8}$ x $\frac{7}{8}$	14	1.40	2.65	3.60
9 $\frac{1}{2}$ x 1 $\frac{1}{2}$ x $\frac{7}{8}$	14	1.50	2.85	4.20

Iron Bushed



FIG. 4677

$\frac{1}{2}$ -Inch

FIG. 4678

DOUBLE WHEEL

NO. 76—JAPANNED

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{2}$
List..... per dozen	\$0.42	.54	.59	.67	.80	1.00	1.40	1.85

NO. 176—GALVANIZED

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{2}$
List..... per dozen	\$1.20	1.30	1.55	1.80	2.95	4.90	5.90	9.50

 $2\frac{1}{2}$ -inch size will take $\frac{5}{8}$ -inch rope. $2\frac{1}{2}$ -inch, half-dozen, balance one dozen in box.

FIG. 4680

DOUBLE WHEEL—SWIVEL EYE

NO. 78—JAPANNED

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	
List..... per dozen	\$0.58	.70	.95	1.15	1.40	2.10	3.30	4.25

NO. 178—GALVANIZED

Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	
List..... per dozen	\$0.90	.98	1.35	1.60	2.10	3.30	5.30	7.10

2-inch, half-dozen, balance one dozen in box.

TACKLE OR AWNING PULLEYS

NO. 74—JAPANNED

Size.....Inches	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{2}$
List..... per dozen	\$0.42	.54	.59	.67	.80	1.00	1.40	1.85	3.60

NO. 174—GALVANIZED

Size.....Inches	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{2}$
List..... per dozen	\$0.63	.74	.80	1.00	1.30	1.85	2.60	4.00	6.60

 $2\frac{1}{2}$ -inch size will take $\frac{5}{8}$ -inch rope.2 and $2\frac{1}{2}$ -inch, half-dozen, balance one dozen in box. $\frac{1}{2}$ Size, $1\frac{1}{4}$ -Inch

FIG. 4679

SWIVEL EYE

NO. 73—JAPANNED

Size.....Inches	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2
List..... per dozen	\$0.53	.63	.85	1.05	1.15	1.65	2.50	3.30

NO. 173—GALVANIZED

Size.....Inches	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2
List..... per dozen	\$0.78	.90	1.15	1.40	1.85	2.60	3.90	5.20

2-inch, half-dozen, balance one dozen in box.



FIG. 4681

SIDE PULLEYS

NO. 25. SINGLE WHEEL JAPANNED



FIG. 4682

Size	inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2
List.....	per doz.	\$0.70	.74	.80	.90	1.00	1.30

Size	inches	$2\frac{1}{4}$	$2\frac{1}{2}$	3	4	5
List	per doz.	\$1.80	2.00	3.00	7.40	12.80

2 inch and smaller, two dozen in a box; $2\frac{1}{4}$ and $2\frac{1}{2}$ inch, one dozen; 3 inch, half dozen; 4 inch, quarter dozen; 5 inch, one-sixth dozen.

SCREW PULLEYS

JAPANNED, INCASED SCREW

No. 43



FIG. 4683

No. 44



FIG. 4684

No. 43	in.	2	$2\frac{1}{2}$	3
Per dozen		\$1.65	2.20	3.00

No. 44	in.	$1\frac{1}{4}$	2
Per dozen		\$1.00	1.40

NEW HAY-FORK PULLEYS

Swivel Eye

No. 115. Cast iron sheave and frame. Five inch sheave for $\frac{7}{8}$ inch rope or smaller. Used for general purposes.

Per dozen\$3.20

No. 116. Cast iron sheave and frame. Six inch sheave for one inch rope or smaller.

Per dozen\$3.70



FIG. 4685

**"BESTOVALL" TRIPLEX HIGH SPEED STEEL
CHAIN HOIST**

1,000 to 4,000

6,000 to 8,000

10,000 to 16,000

20,000

**FIG. 4686**

The **"BESTOVALL"** High Speed Hoist is the last word in chain hoist construction. This hoist will outlast and outlift any other block on the market. It is 100 per cent more efficient than the screw hoist and 175 per cent more efficient than the differential block.

With a 1 ton hoist of this type, one man can lift the full load by overhauling 30 feet of hand chain and a pull of 82 pounds, while with the 2 ton size it requires 120 pounds pull and a hand chain overhaul of 120 feet.

For prices see following page.

"BESTOVALL" TRIPLEX HIGH SPEED STEEL

CHAIN HOIST—CONTINUED

By the adoption of the planetary system of gearing an efficiency of 80 per cent is obtained with this hoist, and the use of steel and malleable iron in every working and load sustaining part has made this a hoist capable of withstanding loads very much above the rated capacity and one in which repairs for broken parts are almost entirely eliminated.

The New Non-Fouling Hand Chain Guide, with which this hoist is equipped, permits of raising and lowering the load by a chain pull from any angle, and the customary jerking and catching of the chain is positively prevented.

SIZES AND PRICES "BESTOVALL" TRIPLEX HOISTS

Capacity in Tons	Price	Regular Hoist in Feet	Reach in Feet and inches	Extra Hoist Price Per Foot	Minimum Distance Between Hooks in inches	Net Wt. in Pounds	Chain Pull in Lbs. to Lift full Load	Feet of Chain Handled to Lift Load one Foot
1/2	\$35.00	8	9-3	\$0.90	15	53	60	20
1	45.00	8	9-5	.95	17	80	80	30
1 1/2	60.00	8	9-7	1.00	19	124	110	33
2	70.00	9	11-0	1.05	24	188	120	40
3	90.00	10	12-8	1.50	32	200	110	66
4	110.00	10	13-1	1.60	37	290	120	80
5	140.00	12	15-9	2.15	40	380	105	120
6	165.00	12	15-10	2.15	40	390	120	120
8	200.00	12	16-3	2.70	51	470	135	168
10	240.00	12	16-9	3.25	57	570	130	200
12	300.00	12	16-9	4.30	57	800	130	120*
16	360.00	12	17-0	5.40	60	950	130	160*
20	425.00	12	18-0	6.50	75	1,300	135	200*

Sizes 3 to 20 tons have lower blocks. *For each hand chain.

For parts, see following pages.

**"BESTOVALL" TRIPLEX HIGH SPEED STEEL
CHAIN HOIST
PARTS LIST**

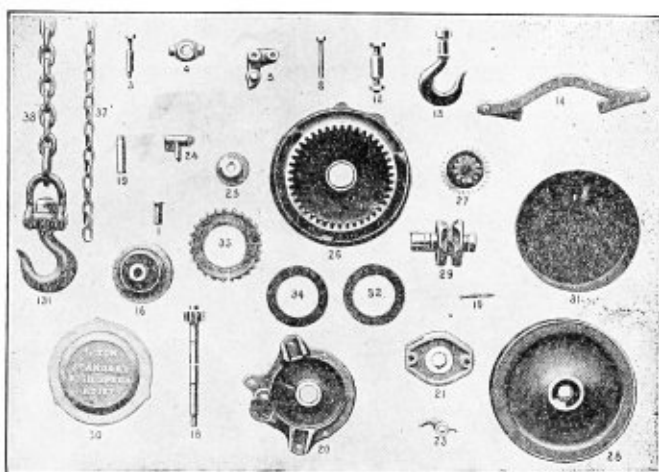


FIG. 4637

List No.	NAME	½ Ton	1 Ton	1½ Ton	2 Ton	3 Ton	4-20 Ton
1	Pawl Stud	\$0.40	\$0.40	\$0.50	\$0.50	\$0.50	\$0.50
3	Small Separator Stud.....	.40	.50	.60	.70	.60	.70
4	Top Cross Head.....	1.00	1.40	2.00	2.40	.....	.....
5	Load Chain Guide.....	.30	.30	.40	.50	.40	.50
8	Load Chain Guide Bolt....	.20	.20	.30	.30	.30	.40
10	Pawl Spring	.20	.20	.30	.30	.30	.30
12	Large Separator Stud.....	.60	.70	.80	1.00	.80	1.00
13	Top Hook	1.00	1.40	1.80	2.00	.....	.....
14	Hand Chain Guides.....	.75	1.20	1.50	1.80	1.50	1.80
15	Hand Chain Guides.....	.75	1.20	1.50	1.80	1.50	1.80
16	Disc Hub	1.80	2.30	3.20	4.20	3.20	4.20
18	Driving Pinion	3.00	4.00	5.00	6.00	5.00	6.00
19	Gear and Pinion Studs....	.40	.60	.70	.80	.70	.80
20	Ratchet Case	2.50	3.50	4.50	5.50	4.50	5.50
21	Pinion Cage	1.60	2.10	3.20	4.20	3.20	4.20
23	Pawl	.20	.20	.30	.30	.30	.30
24	Stripper	.30	.40	.50	.50	.50	.50
25	Check Washer	.40	.50	.70	.80	.70	.90
26	Internal Gear	2.40	3.20	5.00	6.00	5.00	6.00
27	Gear and Pinion.....	.80	1.10	1.40	1.60	1.40	1.60
28	Hand Wheel	1.80	2.30	3.00	3.60	3.00	3.60
29	Load Sheave in Steel.....	2.60	3.20	4.75	6.35	4.75	6.35
30-31	Gear Cover.....	1.20	1.50	1.80	2.10	1.80	2.10
32	Galvanized Disc	.40	.40	.50	.60	.50	.60
34	Leather Disc	.40	.40	.50	.60	.50	.60
35	Ratchet Disc.....	.80	1.00	1.40	1.50	1.40	1.50
37	Hand Chain, per foot....	.25	.25	.25	.25	.25	.25
38	Load Chain, per foot....	.40	.45	.50	.55	.50	.55
131	Lower Swivel Hook.....	1.50	2.30	3.20	5.50	.....	.....

"BESTOVALL" TRIPLEX HIGH SPEED STEEL CHAIN HOIST

PARTS LIST

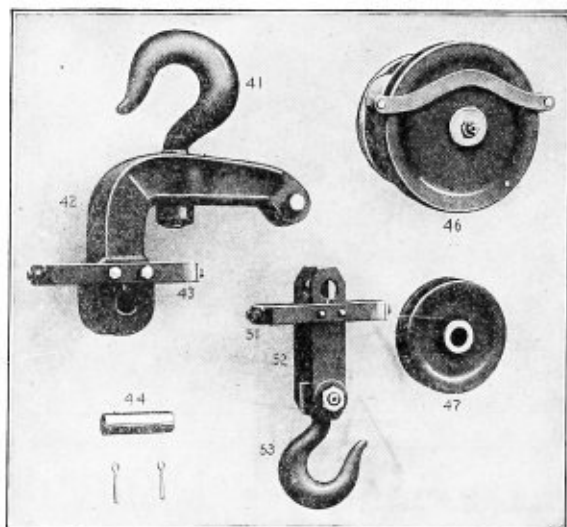


FIG. 4693

PRICE LIST OF PARTS, 3 TO 10 TONS

List No.	NAME	3 Ton	4 Ton	5 Ton	6 Ton	8 Ton	10 Ton
41	Top Hook	\$ 3.00	\$ 5.00	\$ 6.00	\$ 7.00	\$12.00	\$15.00
42	Top Yoke	11.00	15.00	18.00	28.00	35.00	42.00
43	Top Guard and Guides			7.00	9.00	12.00	15.00
44	Top Pin			1.00	1.50	2.00	2.50
46	Main Block	47.50	55.00	55.00	55.00	55.00	55.00
47	Bottom Sheave	3.00	4.50	5.00	6.00	6.00	7.00
51	Bottom Guard and Guides	3.50	4.00	5.00	7.00	8.00	10.00
52	Bottom Side Plates and Crosshead	5.00	6.00	9.00	12.00	15.00	25.00
53	Bottom Hook	3.00	5.00	6.00	7.00	12.00	15.00

"BESTOVALL" DUPLEX SCREW HOISTS



FIG. 4689

Where the higher speeds of the High Speed Hoist are not required, the "BESTOVALL" Duplex Screw Hoist is especially recommended. It is a light, durable, powerful hoist, requiring a minimum of head room, and is particularly adaptable to contractors' use and general repair work—in fact, wherever a hoist has to be continually shifted about.

With this hoist one man can lift the full load, the hand chain pull being cut down at the expense of speed.

Capacity in Tons	Price Complete	Price Per Foot Extra	Lift in Feet	Shortest Dist. Bet. Hooks	Ex- treme Length Ft. In.	Weight	Size of Packing Case in Inches	Gross Wt.
1/2	\$ 25.00	\$1.25	8	13	9-1	45	14x12x12	53
1	30.00	1.30	8	15	9-3	55	16x13x12	69
1 1/2	40.00	1.35	8	17	9-5	75	20x16x14	100
2	50.00	1.40	9	21	10-9	98	22x16x14	120
2 1/2	60.00	1.50	9	23	10-11	150	22x16x14	120
3	75.00	1.90	10	24	12-0	165	22x18x16	200
3 1/2	85.00	1.95	10	25	12-1	180	24x18x18	225
4	95.00	2.00	10	25	12-1	190	24x18x18	225
5	140.00	2.65	12	32	14-9	340	28x21x18	370
6	180.00	2.75	12	33	14-9	350	28x21x18	380
*5	140.00	2.65	12	27	14-3	230	24x20x17	260
*6	180.00	2.75	12	28	14-4	240	24x20x17	270
*7	200.00	3.00	12	32	14-8	260	29x20x19	310
*8	210.00	3.00	12	33	14-9	280	29x20x19	310
*10	275.00	4.00	12	44	15-8	550	38x20x20	621

*Have lower blocks.

"BESTOVALL" DUPLEX SCREW HOIST

PARTS LIST

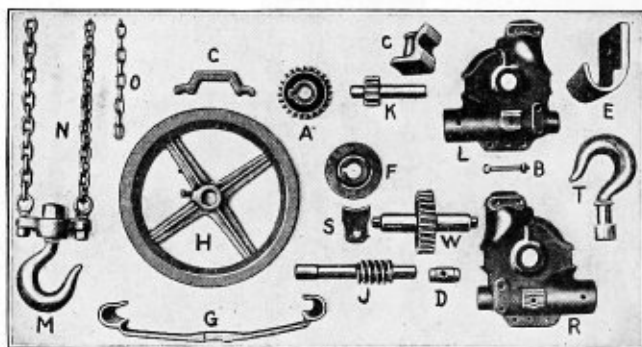


FIG. 4690

PRICES FOR PARTS

List No.	NAME	$\frac{1}{2}$ Ton	1 Ton	$1\frac{1}{2}$ Tons	2 Tons	3 Tons	$3\frac{1}{2}$ Tons	4 Tons	5 Tons	6 Tons	8 Tons
A	Gear .....	.....	.....	.....	.....	\$1.60	\$1.80	\$2.00	\$2.20	\$2.30	\$2.50
B	Through Bolt	\$0.25	\$0.25	\$0.35	\$0.35	.40	.50	.50	.50	.50	.50
C	Load Chain Guard.....	.30	.40	.50	.60	.40	.50	.50	1.00	.50	.50
D	Friction Plug	1.20	1.40	1.70	2.00	2.50	3.00	3.50	4.00	4.20	4.60
E	Hand Chain Guide, each .....	.....	.....	.....	.....	.35	.35	.35	.35	.35	.35
F	Load Wheel, per pair.....	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	8.00
G	Hand Chain Guide.....	.90	1.00	1.30	1.80	2.50	2.50	2.50	2.80	3.00	3.00
H	Hand Wheel	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.00	6.50
J	Worm and Shaft	3.00	3.50	4.00	4.50	5.00	6.00	7.00	10.00	12.00	18.00
K	Pinion and Shaft .....	.....	.....	.....	.....	4.00	4.20	4.40	4.60	4.80	5.20
L R	Housing, each half.....	2.50	3.00	4.00	5.00	6.00	7.00	10.00	15.00	16.00	20.00
M	Bottom Hook Swivel and Eye Bolts.....	2.00	2.50	3.00	3.50	4.50	5.00	6.00	8.00	12.00	20.00
N	Load Chain, per foot...	.40	.40	.45	.45	.50	.55	.55	.60	.50	.55
O	Hand Chain, per foot...	.25	.25	.25	.25	.25	.40	.40	.40	.40	.40
S	Strippers, per pair.....	.30	.40	.50	.60	.70	.80	.90	1.00	1.50	2.50
T	Top Hook	1.00	1.40	1.80	2.40	3.00	4.00	5.00	6.00	7.00	12.00
W	Worm Wheel	3.50	4.00	5.00	6.00	7.00	9.00	11.00	15.00	16.00	20.00

"WRIGHT" SPECIAL "QUICK-LIFT" HOIST

FIG. 4691

You have many places in your plant where loads of from 200 to 800 pounds must be raised many times and quickly.

Your shipping department should have at least one of these for handling heavy boxes. Your receiving department has heavy boxes and bundles of castings which must be moved. You have machines into which heavy castings must be lifted and removed many times a day.

There are hundreds of special uses for this hoist. It is particularly adaptable for quenching dies in drop forge plants, lifting bungs in malleable foundries, handling automobile engines, lifting crucibles in brass foundries, hoisting ashes from ash pits, handling castings in grinding rooms, etc.

This hoist is so geared that the load is raised one foot by overhauling only ten (10) feet of hand chain and a load of 500 pounds is lifted by a pull on the hand chain of 62 pounds.

In this hoist every working and load-sustaining part is of STEEL and MALLEABLE IRON, thus making a hoist in which repairs are almost entirely eliminated.

List Price \$45.00

"BESTOVALL" DIFFERENTIAL CHAIN HOIST
FOR LIFTING LIGHT LOADS

A special hardened Hoist chain, running in even pitch sheaves, has made this a block of the very highest quality.

Differential



FIG. 4692

Capacity in Tons	Price Complete	Regular Hoist in Feet	Extra Lift Per Foot	Minimum Distance Between Hooks	Net Wt. Pounds	Chain Pull	
						Pounds	Feet
$\frac{1}{8}$	\$18.00	5	\$2.80	16 ins.	11	...	...
$\frac{1}{4}$	18.00	6	2.80	17 ins.	22	72	18
$\frac{1}{2}$	21.00	7	2.80	21 ins.	30	122	24
1	28.00	8	3.00	26 ins.	51	216	30
$1\frac{1}{2}$	36.00	$8\frac{1}{2}$	3.20	32 ins.	81	246	36
2	45.00	9	3.40	39 ins.	122	308	42
3	60.00	$9\frac{1}{2}$	4.00	44 ins.	180	557	38

Each foot of extra lift includes four feet of chain.

YALE SPUR-GEARED OR TRIPLEX BLOCKS

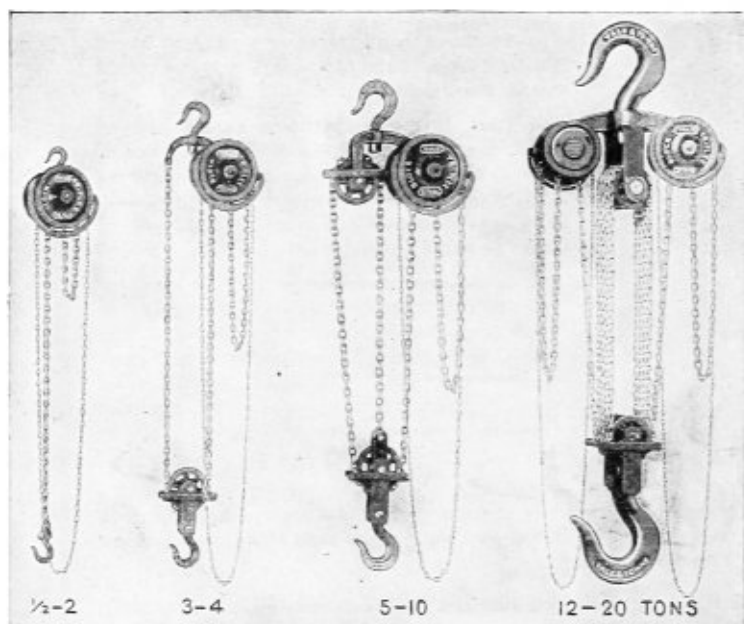


FIG. 4693

These blocks (one-half to 20 tons) are standardized so that all sizes are made up of the parts of the $\frac{1}{2}$, 1, $1\frac{1}{2}$ and 2-ton blocks.

A Yale Quick Speed Block with special gearing is made in two sizes: $\frac{1}{4}$ ton, \$35.00; $\frac{1}{2}$ ton, \$45.00. These blocks are suitable for rapid work in frequent lifting of light loads. They handle light loads at double speed, but require double the chain pull.

Capacity in Tons	Price Complete	Regular Hoist in Feet*	Reach in Feet and Inches	Extra Hoist Price Per Foot	Minimum Distance Between Hooks, in Inches	Net Weight in Pounds	Chain Pull in Pounds to Lift Full Load	Feet of Chain Handled to Lift Load One Foot
$\frac{1}{2}$	\$ 35.00	8	9-1	\$0.30	13	58	62	21
1	45.00	8	9-4	.95	16	92	82	31
$1\frac{1}{2}$	60.00	8	9-6	1.00	18	132	110	35
2	70.00	9	10-9	1.05	21	202	120	42
3	90.00	10	12-8	1.50	32	299	114	70
4	110.00	10	13-1	1.60	37	299	124	84
5	140.00	12	15-9	2.15	45	411	110	126
6	165.00	12	15-10	2.15	46	411	130	126
8	200.00	12	16-1	2.70	49	500	135	168
10	240.00	12	16-6	3.25	54	610	140	210
12	300.00	12	16-6	4.30	54	855	130†	126†
16	360.00	12	17-2	5.40	62	1041	135†	168†
20	425.00	12	17-10	6.50	70	1350	140†	210†

*Figures denote height in feet which blocks with regular lengths of chain will hoist above level on which operator stands. †For each hand chain.

PARTS FOR YALE SPUR GEARED OR
"TRIPLEX" BLOCKS

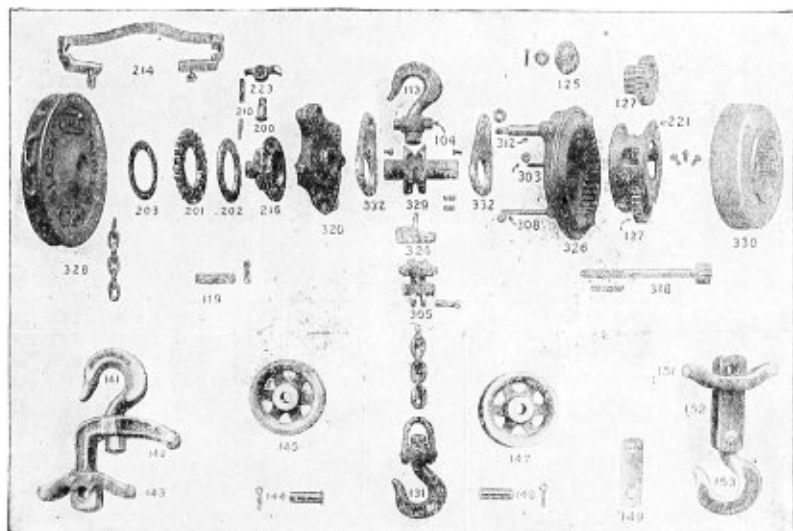


FIG. 4694

For prices see following page.

PARTS OF YALE "SPUR-GEARED" OR "TRIPLEX BLOCKS"—MODEL SS

In ordering parts state whether for "1898 Model" or "Model SS." Parts 113 to 223 are same in both models. Parts 303 to 332 differ in "1898 Model" and "Model SS."

List No.	Name	1/2 Ton	1 Ton	1 1/2 Tons	2 Tons	3 Tons	4 to 20 Tons
Parts Interchangeable in "1898 Model" and "Model SS"	104 Top Cross Head.....	\$1.00	\$1.40	\$2.00	\$2.40	....	....
	113 Top Hook and Nut.....	1.00	1.40	1.80	2.00	....	....
	119 Gear and Pinion Pins (each)...	.40†	.60	.70	.80	\$0.70	\$0.80
	125 Check Washer.....	.40	.50	.70	.90	.70	.90
	127 Gear and Pinions (each).....	.80†	1.10	1.40	1.60	1.40	1.60
	131 Lower Swivel Hook.....	1.50	2.30	3.20	5.50	....	....
	200 Pawl Stud.....	.40	.40	.50	.50	.50	.50
	201 Ratchet Disc.....	.80	1.00	1.40	1.50	1.40	1.50
	202 Leather Disc.....	.40	.40	.50	.60	.50	.60
	203 Galvanized Iron Disc.....	.40	.40	.50	.60	.50	.60
	210 Pawl Spring.....	.20	.20	.30	.30	.30	.30
	214 Strap Hand Chain Guide.....	.75	1.20	1.50	1.80	1.50	1.80
	216 Disc Hub.....	1.80	2.30	3.20	4.20	3.20	4.20
	221 Pinion Cage.....	1.60†	2.10	3.20	4.20	3.20	4.20
	223 Pawl.....	.20	.20	.30	.30	.30	.30
Parts differ in "1898 Model" and "Model SS"	303 Small Separator.....	.40	.50	.60	.70	.60	.70
	304 Top Cross Head.....	1.00	1.40	2.00	2.40	....	....
	305 Load Chain Guide.....	.30	.30	.40	.50	.40	.50
	308 Load Chain Guide Bolt.....	.20	.20	.30	.40	.30	.40
	312 Large Separator.....	.60	.70	.80	1.00	.80	1.00
	314 Continuous Hand Chain Guide..	1.50	2.00	2.50	3.00	2.50	3.00
	318 Driving Pinion.....	3.00†	4.00	5.00	6.00	5.00	6.00
	320 Ratchet Case.....	2.50	3.50	4.50	5.50	4.50	5.50
	324 Stripper.....	.30	.40	.50	.50	.50	.50
	326 Internal Gear.....	2.40	3.20	5.00	6.00	5.00	6.00
	328 Hand Wheel.....	1.80†	2.30	3.00	3.60	3.00	3.60
	329 Load Sheave.....	2.00	3.20	4.75	6.35	4.75	6.35
	330 Gear Cover.....	1.20	1.50	1.80	2.10	1.80	2.10
	332 Suspension Plate (each).....	1.50	2.00	2.50	3.00	2.50	3.00
	Load Chain, Steel, ft.....	.40*	.45*	.50*	.55*	.50*	.55*
	Hand Chain, Steel ft.....	.25	.25	.25	.25	.25	.25

PARTS OF YALE "SPUR-GEARED" OR "TRIPLEX BLOCKS" 3 TON AND LARGER

No.	3 Ton	4 Ton	5 Ton	6 Ton	8 Ton	10 Ton	12 Ton	16 Ton	20 Ton
341	\$3.00	\$ 5.00	\$ 6.00	\$ 7.00	\$12.00	\$15.00	\$24.00	\$32.00	\$65.00
342	6.35	14.30	16.60	20.00	25.00	28.00	32.00	40.00	64.00
143	....	....	4.80	7.00	8.00	9.00	10.00	11.50	13.00
144	....	....	1.00	1.50	2.00	2.50	3.50	4.00	5.50
145	....	....	3.00	4.50	5.00	5.50	5.50	5.50	5.50
147	3.00	4.50	4.50	6.00	6.00	7.00	7.00	7.00	7.00
148	.80	1.30	1.50	2.00	2.50	3.00	4.00	5.00	6.50
149	....	....	4.00	6.00	7.00	8.00	....	....	....
151	3.50	4.00	5.00	7.00	8.00	10.00	12.00	13.50	15.50
152	3.20	5.00	7.00	9.00	11.00	13.00	19.00	24.00	32.00
153	3.00	5.00	6.00	7.00	12.00	15.00	24.00	32.00	65.00
341	Top Hook.....	145	Top Sheaves.....	151	Bottom Guards				
342	Top Yoke.....	147	Bottom Sheave.....	152	and Guides.....				
143	Top Guard and Guides.....	148	Bottom Sheave Pin.....	153	Bottom Side Plates and Crosshead.....				
144	Top Sheave Pin.....	149	Becket Straps.....	153	Bottom Hook.....				

*In ordering Load Chains specify whether or not hook is required.

†Parts should be specified "Quick Speed" for blocks so marked on the gear cover.

1/2 ton quick speed uses 1/2 ton parts; 1/2 ton quick speed uses 1 ton parts.

Always give size of block. Parts 329 and 221 are a driven fit. In assembling see

that the locating holes in No. 127 line up at the center.

If parts are for Trolley Blocks specify model, capacity and size of I-beam.

YALE SCREW-GEARED OR "DUPLEX" BLOCKS

1-2 TO 10 TONS

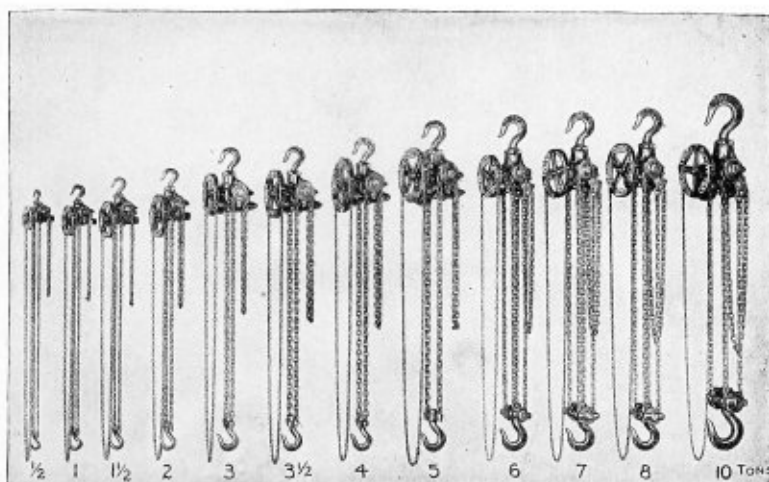


FIG. 4695

Capacity in Tons	Price, Complete	Regular Hoist in Feet*	Extra Hoist, Price Per Foot	Minimum Distance Between Hooks in Inches	Reach in Feet and Inches†	Net Weight in Lbs.	Chain Pull‡	
							Lbs.	Feet
1/2	\$ 25.00	8	\$1.25	13	9-1	46	68	40
1	30.00	8	1.30	16	9-4	59	87	59
1 1/2	40.00	8	1.35	19	9-7	81	94	80
2	50.00	9	1.40	21	10-9	104	115	93
3	75.00	10	1.50	25	12-1	187	132	126
4	95.00	10	1.90	29	12-5	221	142	155
5	140.00	12	2.00	31	14-7	331	145	195
6	180.00	12	2.80	33	14-9	310	145	252
8	210.00	12	3.00	36	15-0	416	160	310
10	275.00	12	3.20	45	15-9	578	160	390

*Figures denote height in feet which blocks, with regular lengths of chain, will hoist from level on which operator stands. Extra lengths of chain should be ordered when it is desired to hoist higher. No deduction is made for blocks with less than the regular length of chain.

†The "Reach" is the sum of the "Hoist" and the "Minimum Distance between Hooks." When hung at this height, to lift the full hoist above the floor, the hand chain of Spur-geared and Screw-geared Blocks hangs down to within 18 inches of the floor.

‡Figures denote the pull in pounds required to lift the full load, and the number of feet of hand chain which must be handled to lift the load one foot.

**PRICES FOR PARTS OF YALE SCREW-GEARED
OR "DUPLEX" BLOCKS
1-2 TO 5 TONS**

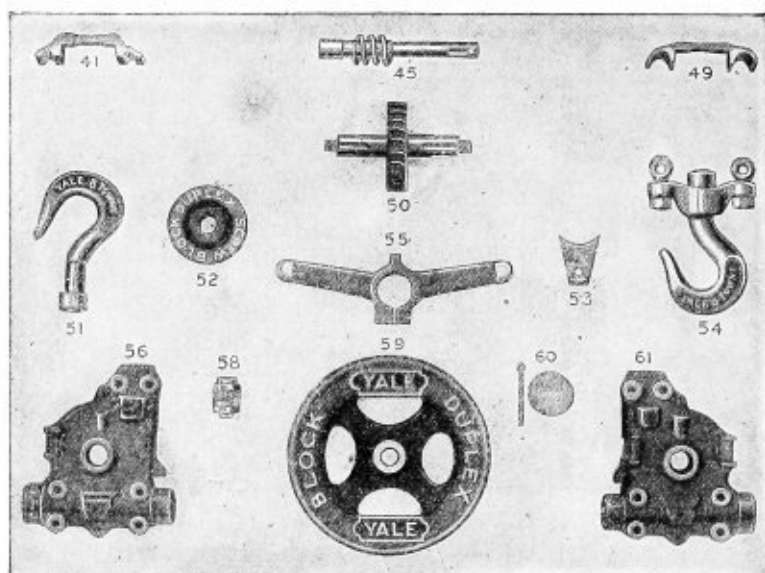


FIG. 4696

List No.	Name	$\frac{1}{2}$ Ton	1 Ton	1½ Tons	2 Tons	3 Tons	3½ Tons	4 Tons	5 Tons
41	Load Chain Guide.....	\$0.40	\$0.50	\$0.60	\$0.70	\$1.00	\$1.20	\$1.40	\$ 1.60
45	Worm and Shaft.....	3.00	3.50	4.00	4.50	5.00	6.00	7.00	10.00
49	Load Chain Guard.....	.30	.40	.50	.60	.70	.80	.90	1.00
50	Worm Wheel.....	3.50	4.00	5.00	6.00	7.00	9.00	11.00	15.00
51	Top Hook and nut.....	1.00	1.40	1.80	2.40	3.00	4.00	5.00	6.00
52	Load Sheave, per pair....	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00
53	Strippers, per pair.....	.30	.40	.50	.60	.70	.80	.90	1.00
54	Bottom Hook Swivel and Eye Bolts.....	2.00	2.50	3.00	3.50	4.50	5.00	6.00	8.00
55	Hand Chain Guide.....	.90	1.00	1.30	1.80	2.00	2.40	2.60	2.80
6-61	Housing, pair.....	5.00	6.00	8.00	10.00	12.00	14.00	20.00	30.00
58	Friction Plug.....	1.20	1.40	1.70	2.00	.....	.....	.....	.....
59	Hand Wheel, see note below	1.50*	1.60*	2.50*	3.00*	3.50	4.00	4.50	5.00
60	Friction Plug Cover.....	.30	.30	.40	.50	.....	.....	.....	.....
72	Pinion Shaft.....	.....	.....	.....	.....	4.00	4.20	4.40	4.60
74	Gear.....	.....	.....	.....	.....	1.60	1.80	2.00	2.20
91	Friction Plug Cover.....	.....	.....	.....	.....	.50	.50	.50	.50
92	Friction Plug.....	.....	.....	.....	.....	2.50	3.00	3.50	4.00
	Hand Chain, steel, ft.*....	.25†	.25†	.25†	.25†	.25	.40	.40	.40
	Load Chain, steel, ft.....	.37	.40	.42‡	.45	.50	.55	.55	.60

*In ordering Hand Wheels or Hand Chain give number of pockets for chain links in rim of wheel.

†Hand chain for old model Blocks \$0.37½ per foot for ½, 1, 1½ and 2 Ton sizes.

HARRINGTON PEERLESS HOIST

SPUR-GEARED SINGLE CHAIN



FIG. 4697

The "Peerless" is the very latest type of spur-gear hoist, and surpasses any block on the market for speed, power-saving and efficiency. Although extremely light, its strength and durability are unimpaired.

The hoisting mechanism consists of a balance train of steel spur-gears, machine-cut from drop-forged blanks. The sustaining mechanism is composed of a set of friction disks, which act only to hold the load, and thus do not impair the efficiency of the block in either hoisting or lowering. The noiseless action of the hoist, its light weight and the absolute protection of all working parts from dirt, together with high efficiency, make it especially desirable for all classes of work.

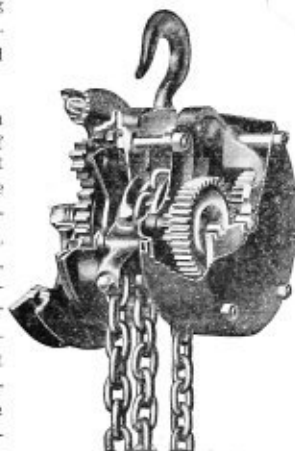


FIG. 4698

Capacity, in Pounds	Regu- lar Lift, in Feet	Price of Hoist, Regular Lift	Price of Extra Lift, Per Foot	Minimum Distance Between Hooks, Inches	Weight of Hoist (Regular Lift) in Lbs., Net	Pull on Hand Chain to lift full load, in Pounds	Feet of chain to handle to lift load one foot	Num- ber of Strands of load chain	Regular Style
500	8	\$ 30.00	\$0.85	13	48	50	14.0	1	
1,000	8	35.00	.90	14	62	64	20.3	1	
2,000	8	45.00	.95	16	84	81	31.5	1	
3,000	8	60.00	1.00	19	115	114	34.5	1	
4,000	9	70.00	1.05	22½	157	124	40.5	1	
6,000	10	90.00	1.25	24	236	130	59.0	1	
8,000	10	110.00	1.60	29	230	128	\$1.0	2	
10,000	12	140.00	2.00	32	352	112	118.0	2	
12,000	12	165.00	2.00	34½	359	124	118.0	2	
16,000	12	200.00	2.75	39¾	460	125	177.0	3	
20,000	12	240.00	3.20	42	533	181	154.5	3	
30,000	12	340.00	4.60	55¼	995	208†	103.0†	4	
40,000	12	425.00	6.40	62¼	1,260	186†	154.5†	6	

†On each of two hand chains.

HARRINGTON IMPROVED SCREW HOIST

DOUBLE CHAIN



FIG. 4699

These hoists are everywhere recognized as the standard hoist of the world. They are compact, powerful and easily handled. The hoisting mechanism consists of a steel worm, engaging a bronze worm-gear, on the squared hubs of which are carried the lifting sheaves. The gearing is enclosed in an oil-tight housing, insuring thorough immersion in oil and smoothness of action. The new hand-chain guard is absolutely snag-proof.

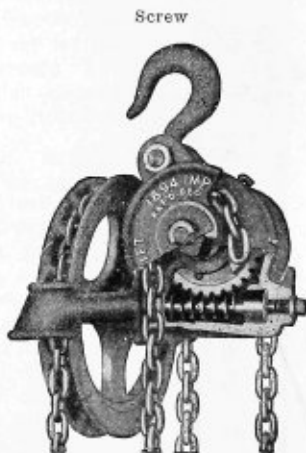


FIG. 4700

PRICES AND DATA ON HARRINGTON SCREW HOISTS

Capacity, in Pounds	Regu- lar Lift, in Feet	Price of Hoist, Regular Lift	Price of Extra Lift, Per Foot	Minimum Distance Between Hooks, Inches	Weight of Hoist (Regu- lar Lift), in Pounds, Net	Pull on Hand Chain to lift full load, in Pounds	Feet of chain handled to lift load of one foot	Num- ber of Strands of load chain
500	8	\$ 22.50	\$1.10	14½	43	20	64.0	2
1,000	8	25.00	1.20	17	71	49	60.5	2
2,000	8	30.00	1.30	18	78	71	76.0	2
3,000	8	40.00	1.40	19	111	99	88.5	2
4,000	9	50.00	1.44	22	167	129	93.5	2
6,000	10	75.00	1.50	30	250	163	96.0	2
8,000	10	95.00	1.70	32	329	190	128.0	2
10,000	12	140.00	2.20	39	480	293	103.0	2
12,000	12	180.00	2.50	39½	557	293	110.0	2
16,000	12	210.00	2.90	41	751	403	148.0	2
20,000	12	275.00	2.90	47	789	358	198.0	2
30,000	12	340.00	5.10	51¾	1,159	424	296.0	4

"CYCLONE" HIGH SPEED CHAIN HOIST

TRADE-MARK

 $\frac{1}{4}$ to 3 tons

4 to 12 tons

16 to 40 tons



FIG. 4701



FIG. 4702



FIG. 4703

Sizes $\frac{1}{4}$ ton to 3 tons inclusive are made with single load chains as shown by the first engraving. These sizes, however, can be made with double load chains as shown by second engraving if desired.

Sizes 4 tons to 12 tons inclusive are made with double load chains as shown by the second engraving.

Sizes 16 tons to 40 tons inclusive are made similar to last engraving, above.

SPECIAL DESCRIPTION OF THE 40-TON SIZE

The head of the Hoist is divided into three sections by two partitions, the two outer sections each containing a load chain wheel, and the central section a pinion and three spur gears. This pinion is mounted on the hand wheel shaft. The two load chain wheels are each mounted on a hollow steel shaft, and the hand wheel shaft ($1\frac{3}{8}$ -inch diameter) passes through these hollow shafts, carrying the pinion in the central division which drives the three spur wheels, these spur wheels mounted on shafts $1\frac{1}{4}$ -inch diameter, turned down to eccentric ends of $1\frac{1}{4}$ -inch diameter. These three eccentrics carry in each of the outer divisions a spur wheel having 48 teeth, which mesh into an internal gear on the load chain wheel having 50 teeth, so that each revolution of the eccentric gives a gyratory movement to the spur wheel, each revolution of the eccentric moving the load chain forward two teeth.

The hand wheel shaft turns in graphite bronze bushings, the eccentrics in hardened steel roller bushings, the eccentric shafts are hardened, and hardened and ground steel bushings are pressed into the malleable iron frame, and the steel rollers contained in cages.

Phantom View Showing
One-half of Internal
Construction



FIG. 4704

"CYCLONE" HIGH SPEED CHAIN HOISTS

(TRADE MARK)

**HIGH SPEED CHAIN HOIST
WITH SELF-LUBRICATING BEARINGS**

FIG. 4705

**FRONT AND REAR
VIEWS****INTERNAL
CONSTRUCTION**

FIG. 4706

THE FOLLOWING ARE ITS STRONG POINTS
**SPEED; ABSENCE OF VIBRATION; ACCURATELY CUT AND STRONG
 GEARS; DURABILITY; SAFETY**

SPEED—The peculiar gyrating movement of the hoist and the perfect balance of all its parts make possible a very high speed with practically No Vibration.

NO VIBRATION—The fact that these hoists run so smoothly and are without vibration renders them eminently well fitted for handling molds in a foundry. Vibration is fatal to a hoist for foundry use.

GEARS—All the gears are accurately cut. No cast gears are used in these hoists. It is due to this as well as to its gyrating movement that the hoists run so smoothly.

DURABILITY—The parts are all heavy and strong, giving the hoist a long life. There is no delicate mechanism nor small gears to wear out rapidly.

SAFETY—In the first cut is shown the teeth of the lift wheel surrounded by two yokes. This is the lifting mechanism of the hoist. Notice how many teeth are in contact. This relation between the teeth of the lift wheel and the yoke never varies, there are always the same number in contact.

CHAIN—The chains are accurately made to gauge and tested to one and a half times the rated capacity of the hoist.

PRICE LIST OF COMPLETE HOIST

Capacity	Price Complete	Height of Lift	Extra Chain per Foot of Lift	Net Weight Comp. with Chains	Gross Weight Boxed	Chain Pull to Lift Full Load	Length of Chain Handled to Lift Load One Ft.	Shortest Distance Between Hooks
Tons		Feet		Pounds	Pounds	Pounds	No. Feet	Inches
$\frac{1}{2}$	\$ 35.00	8	\$0.90	71	89	56	20	15
1	45.00	8	.95	99	107	79	33	17
$1\frac{1}{2}$	60.00	8	1.00	118	136	102	39	19
2	70.00	9	1.05	161	184	109	47	21
3	90.00	10	1.30	226	267	115	70	22
4	110.00	10	1.60	260	315	120	91	34
5	140.00	12	2.10	376	443	104	123	38
6	165.00	12	2.10	410	477	109	140	41
8	200.00	12	2.70	484	557	135	159	43
10	240.00	12	3.25	652	722	144	191	47
12	300.00	12	3.30	695	779	160	195	50
16	360.00	12	3.80	872	1022	149	285	44
20	425.00	12	6.50	1600	1927	*90	336	50
30	525.00	12	9.00	1860	2187	*90	504	63
40	650.00	12	11.50	2120	2555	*90	670	82

†Figures in third column denote approximate height which blocks, with regular lengths of chain, will lift from level on which operator stands.

‡For every additional foot of lift desired, sizes up to 3-ton, require one foot extra main chain and two feet hand chain; other sizes 2 feet extra both main and hand chain, except 16-ton and over."

"MOORE ANTI-FRICTION" CHAIN HOIST

TRADE MARK

This Hoist has been on the market for a number of years with steadily increasing sales.

It is equipped with a very efficient AUTOMATIC BRAKE which absolutely locks the load at any point and is instantly released by a reverse pull of the hand chain.

It has spur gears. It has fewer working parts than any Hoist on the market except the Direct Differential.

It is a good Hoist for general work and will stand hard usage. The parts are all protected from weather and dust.



FIG. 4707

Capacity	Price Complete with Chains	Extra Main Chain per Foot	Extra Hand Chain per Foot	Extra per Foot of Lift	Height of Lift	Net Weight Complete with Chain	Shortest Distance Between Hooks	Chain Overhauled to Raise One Ft.
Tons					Feet	Pounds	Inches	Feet
$\frac{1}{2}$	\$25.00	\$0.40	\$0.25	\$1.30	8	55	17 $\frac{3}{8}$	45
1	30.00	.44	.25	1.38	8	80	21	47
1 $\frac{1}{2}$	40.00	.48	.25	1.46	8	94	21 $\frac{1}{2}$	59
2	50.00	.52	.25	1.54	9	126	24	65
3	70.00	.60	.25	1.70	10	190	28	108
4	95.00	.70	.25	1.90	11	240	29	120
5	125.00	.80	.25	2.10	12	358	34 $\frac{1}{2}$	166

†Figures in sixth column denote approximate height which blocks, with regular lengths of chain, will lift from level on which operator stands.

For every additional foot of lift desired, two feet extra of both main and hand chain will be necessary.



FIG. 4708

"DIRECT"

DIFFERENTIAL PULLEY BLOCKS

EACH BLOCK THOROUGHLY TESTED

PRICE LIST OF COMPLETE BLOCKS

Cap.	Winch Lift	Price	Reg. Chain	Extra Chain per Ft.	Gross Weight Boxed	Shortest Distance Between Hooks
Tons	Feet		Feet		Lbs.	Inches
$\frac{1}{4}$	6	\$18.00	22	\$0.70	28	17
$\frac{1}{2}$	7	21.00	26	.70	38	21
$\frac{3}{4}$	8	25.00	30	.75	45	25
1	8	28.00	30	.75	61	26
1 $\frac{1}{2}$	8 $\frac{1}{2}$	36.00	33	.80	99	32
2	9	45.00	36	.85	145	39
3	10	60.00	38	1.00	210	44

Allow four feet of chain for each additional foot of lift.

Always specify "DIRECT" when ordering this style of block.

C. & M. "STANDARD" SCREW CHAIN HOIST

A POWERFUL AND EASY WORKING BLOCK



FIG. 4709

No vibration. All working parts protected from weather and dust. The Hoist always hangs plumb. The Worm Gear is of Bronze on a Steel Shaft and is operated by a Steel Worm. Hardened Tool Steel Thrust Bearings.

Capacity, Tons	Price Complete with Chain	Extra Main Chain per foot	Extra Hand Chain per foot	Extra per foot of Lift	Height of Lift, Feet	Weight Complete with Chains, Pounds	Shortest Dist. between Hooks, Ins.	Chain over-hauled to raise one foot, Feet
$\frac{1}{2}$	\$25.00	\$0.40	\$0.25	\$1.00	8	56	16	47
1	30.00	.44	.25	1.10	8	77	17	58
$1\frac{1}{2}$	40.00	.48	.25	1.20	8	81	17	73
2	50.00	.52	.25	1.30	9	99	20	83
3	75.00	.60	.25	1.50	10	157	24	120

†Figures in sixth column denote approximate height which blocks, with regular lengths of chain, will lift from level on which operator stands.

‡For every additional foot of lift desired, two feet extra of both main and hand chain will be necessary.

GEARED AND PLAIN YOKE TROLLEYS

FORGED FRAME, FOUR WHEELS, STEEL ROLLER BUSHED

Geared Trolley

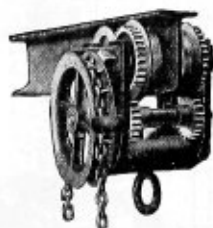


FIG. 4710

Capacity, Pounds	Tread Diameter of Wheels, In.	List Price		Distance from under side of Beam to Bottom of swivel eye, In.		Weight, Pounds	
		Ge'd	Plain	Ge'd	Plain	Ge'd	Plain
2000	5	\$35.00	\$20.00	9 $\frac{3}{4}$	8 $\frac{3}{4}$	110	70
3000	5	38.00	26.00	9 $\frac{3}{4}$	8 $\frac{3}{4}$	120	75
4000	5	40.00	28.00	9 $\frac{3}{4}$	8 $\frac{3}{4}$	132	85
6000	5 $\frac{3}{8}$	47.00	33.00	10	9	165	90
8000	6	52.00	37.00	10 $\frac{1}{4}$	10 $\frac{1}{4}$	225	150
10000	6	65.00	43.00	11	11	242	180
12000	8	80.00	55.00	13 $\frac{3}{4}$	13 $\frac{3}{4}$	320	230
16000	9	95.00	70.00	14 $\frac{1}{2}$	14 $\frac{1}{2}$	390	295
20000	9	115.00	85.00	14 $\frac{1}{2}$	14 $\frac{1}{2}$	415	330

Plain Trolley



FIG. 4711

In ordering please state size and weight of I beam for which the trolley is intended.

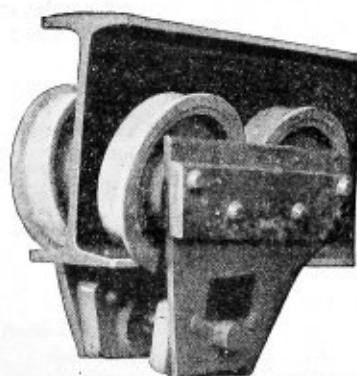
"BESTOVALL" STEEL TROLLEYS**PLAIN AND GEARED**

BESTOVALL Steel Trolleys, both plain and geared, are built in all capacities up to and including 10 tons, the sizes larger than this being made up special.

These trolleys are made up with solid steel side plates and all four wheels are supported on large steel pins through good substantial roller bearings.

The equalizing pin which connects the two halves of trolley may be taken out and trolley placed on I beam at any point. This pin also permits of the use of washers to further separate the two halves of trolley, thus enabling its use on sizes of I beam other than standard.

The **BESTOVALL** guarantee of absolute satisfaction protects users of **BEST-OVALL** Steel Trolleys.

**FIG. 4712****FIG. 4713****PRICE LIST BESTOVALL STEEL TROLLEYS**

Capacity in Tons	Size of I Beam Inches	Greatest Distance Between Supports	Net Weight		List Price	
			Plain	Geared	Plain	Geared
$\frac{1}{2}$	5 to 12	14 ft.	38 lbs.	.....	\$16.00	.....
1	5 to 12	14 ft.	85 lbs.	105 lbs.	20.00	\$35.00
$1\frac{1}{2}$	6 to 12	15 ft.	110 lbs.	145 lbs.	26.00	38.00
2	7 to 12	16 ft.	125 lbs.	180 lbs.	28.00	40.00
3	8 to 12	16 ft.	135 lbs.	225 lbs.	33.00	47.00
4	10 to 15	16 ft.	200 lbs.	310 lbs.	37.00	52.00
5	10 to 15	18 ft.	265 lbs.	375 lbs.	43.00	65.00
6	10 to 15	22 ft.	340 lbs.	445 lbs.	55.00	80.00
8	10 to 20	29 ft.	405 lbs.	540 lbs.	70.00	95.00
10	12 to 24	34 ft.	535 lbs.	640 lbs.	85.00	115.00

"MATCHLESS" **ADJUSTABLE MALLEABLE FRAME TROLLEYS**

(Patents December 17, 1907, and Pending)

Geared

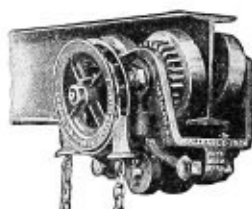


FIG. 4714

Plain

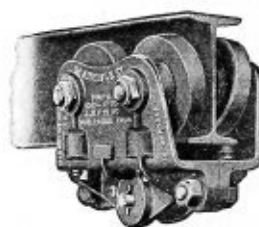


FIG. 4715

These Trolleys are readily adjusted to the different sizes I beams specified in the price list. They have flangeless track wheels with vertical guide rollers.

The track wheels have hardened steel roller bearings (hardened steel bushings pressed into the wheels, hardened steel axles and hardened steel rollers enclosed in brass cages).

On the Geared Trolley, the Gears are cut. They work very freely and have a large safety factor.

The Hoist is to be hung on the central bolt. The top of the hoist hook reaches to within an inch and a half of the I beam, making a very close connection.

The fact that these Trolleys are adjustable admits of their being carried in stock by dealers.

To lubricate Track Wheels, force grease through the holes in exposed ends of the axle studs. This can be done without taking the Trolley down.

IN ORDERING STATE SIZE AND WEIGHT OF I BEAM

Capacity, Pounds	Tread Diameter of Wheel, Inches	Adjustable for Sizes I Beams, Inches	Price		Weight, Pounds	
			Geared	Plain	Geared	Plain
1000	4	5, 6, 7	.....	\$16.00	...	35
2000	5	6, 7, 8	\$ 35.00	20.00	60	47
3000	5	6, 7, 8	38.00	26.00	70	56
4000	6	7, 8, 9	40.00	28.00	90	74
6000	6½	8, 9, 10	47.00	33.00	118	102
8000	7	9, 10, 12	52.00	37.00	177	155
10000	8	10, 12, 15	65.00	43.00	218	194
12000	8	10, 12, 15	80.00	55.00	265	240
16000	9	12, 15, 18	95.00	70.00	421	378
20000	10	15, 18, 20, 24	115.00	85.00	480	434
24000	10	15, 18, 20, 24	130.00	110.00	600	550

DIRECTIONS FOR ADJUSTING MATCHLESS TROLLEYS

The vertical guide rollers are on eccentric shafts. Turn these shafts and lock them with the cap screw at the figure denoting the size of the I beam.

PLAIN TROLLEYS

MALLEABLE IRON FRAME, FOUR WHEELS, ROLLER BEARINGS

Made for I beams ranging from 3 to 8 inches.

Especially adapted to garage uses and in places where the work is light and where curves of very small radius are not used.

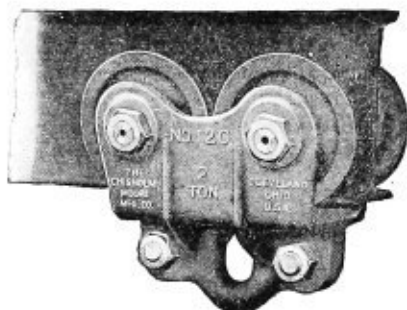


FIG. 4716

PRICE LIST

Capacity, Pounds	Weight, Pounds	Tread Diameter of Wheel, Inches	For I Beams, Inches	Price
500	13	2	3 and 4	\$ 7.00
1000	29	3 $\frac{3}{4}$	5 and 6	8.00
2000	33	3 $\frac{3}{4}$	5 and 6	10.50
3000	52	4 $\frac{1}{2}$	6 and 7	13.50
4000	72	5 $\frac{1}{2}$	7 and 8	17.00

In ordering state size and weight of I beam.

"C-M" TROLLEY HOIST

NO. 429

WITH TRACK CLAMP



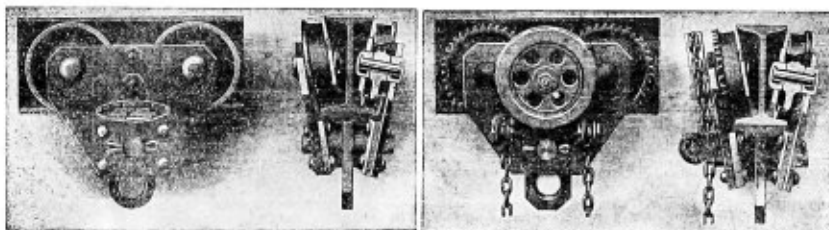
Its usefulness is manifest in places requiring close headroom. The unusual construction of all its carefully machined parts develops very high efficiency.

Every gear cut from machined blanks. Case hardened steel rollers, steel axles, bushings, shafts and eccentrics used throughout. All chain of highest quality and tested to a large factor of safety.

FIG. 4717

PRICE LIST

Capacity	Price	Net Weight	Gear Ratio	Efficiency	Minimum Distance Between Hook and Track
Tons		Pounds			Inches
$\frac{1}{2}$	\$ 63.00	127	$22\frac{1}{2}$ to 1	80%	10
1	75.00	132	30 to 1	80%	$10\frac{1}{4}$
$1\frac{1}{2}$	100.00	175	38 to 1	80%	13
2	120.00	210	46 to 1	80%	17

"BROWNHOIST" PLAIN AND GEARED TROLLEYS**FIG. 4718****FIG. 4719**

Capacity in Tons	Size of I-Beam Inches	Greatest Distance Between Support Feet	Smallest Radius for I-Beam Curve, Inches	Diameter of read of Wheels Inches	Price		Weight in Lbs.		Pull on Hand Chain*	
					Plain	Geared	Plain	Geared	Plain	Geared
1/4	4	10	18	3	\$14.00	.....	25	.....	25	.....
1/2	5	13	21	3 3/4	16.00	.....	30	.....	26	.....
1	6	14	21	4 3/4	20.00	40.00	50	90	47	15
1 1/2	7	14	30	5 1/2	25.00	45.00	95	140	65	24
2	8	15	36	6 1/2	30.00	50.00	115	170	74	23
2 1/2	9	15	42	7 1/4	40.00	60.00	150	180	45	16
3	10	15	48	8 1/4	50.00	70.00	210	350	50	18
3 1/2	12	17	54	10	65.00	90.00	270	360	60	20
4	15	21	60	10	80.00	100.00	350	450	70	23
5	20	25	60	12	95.00	110.00	420	540	90	28
6	24	28	60	13	110.00	130.00	550	650	115	35
8	30	32	60	13	110.00	130.00	600	700	150	42
10	36	36	96	18	180.00	220.00	1100	1400	180	44
12	42	42	120	18	200.00	250.00	1200	1500	260	49

*Pull in pounds on hand chain to move fully loaded trolley along track.

CAST IRON AND FLAT RAIL TROLLEYS**FIG. 4720****"BROWN-
HOIST" CAST
IRON
TROLLEYS****"BROWN-
HOIST"
FLAT
RAIL
TROL-
LEYS****FIG. 4721**

Capacity in Tons	Standard I-Beam Inches	Min. Radius Curve Inches	Price Cast Iron	
			Plain Bearing	Roller Bearing
1/4	4	18	\$7.00	.....
1/2	5	21	8.00	.....
1	6	21	10.50	\$17.50
1 1/2	7	30	13.50	22.00
2	8	36	17.00	27.00
3	9	42	.....	37.50

Capacity in Tons	Size of Rail	Greatest Dis- tance between Hangers in Ft.	Price of Trolleys	
			Plain	Geared
1/4	3x1 1/2 "	6	\$9.00	.....
1/2	3x1 1/2 "	5	9.00	.....
1	4x3 1/2 "	6	15.00	\$35.00
1 1/2	4x3 1/2 "	5	15.00	35.00
2	4x3 1/2 "	4	15.00	35.00

BROWNHOIST SWINGING BRACKET JIBS

COMPLETE WITH TROLLEYS

I-Beam Jibs with Double Adjustable Tie Rods and Self-Oiling Bearings

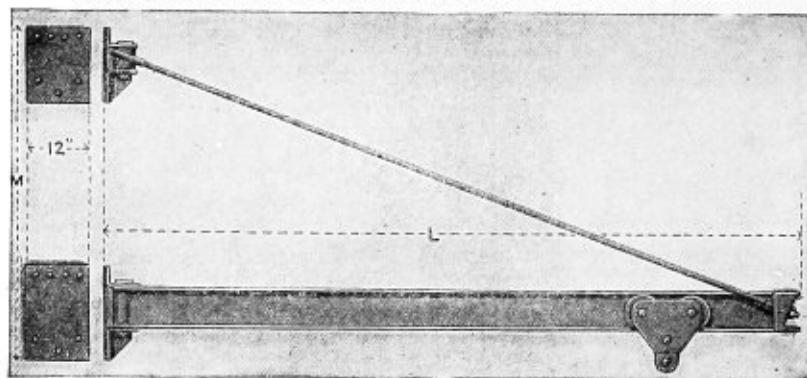


FIG. 4722

Capacity in Tons	Dimensions in Feet and Inches		Size of I-Beam	Weight without Trolley	PRICES		
	L	M			Without Trolley	With Cast Iron Trolley	With Steel Plate Trolley
1	11 ft.—6 in.	5 ft.—3½ in.	8 in.—18	lbs. 500 lbs.	\$70.00	\$80.50	\$90.00
1	13 ft.—11 in.	5 ft.—3½ in.	8 in.—18	lbs. 560 lbs.	75.00	85.50	95.00
1	16 ft.—5 in.	6 ft.—3½ in.	8 in.—18	lbs. 620 lbs.	80.00	90.50	100.00
1	20 ft.—0 in.	7 ft.—4½ in.	8 in.—18	lbs. 700 lbs.	90.00	100.50	110.00
2	11 ft.—7 in.	5 ft.—3½ in.	8 in.—18	lbs. 510 lbs.	75.00	92.00	105.00
2	14 ft.—1 in.	5 ft.—3½ in.	8 in.—18	lbs. 580 lbs.	80.00	97.00	110.00
2	16 ft.—7 in.	6 ft.—3½ in.	9 in.—21	lbs. 700 lbs.	90.00	.....	120.00
2	20 ft.—0 in.	7 ft.—4½ in.	10 in.—25	lbs. 850 lbs.	100.00	.....	130.00
3	11 ft.—0 in.	6 ft.—3½ in.	9 in.—21	lbs. 540 lbs.	80.00	.....	120.00
3	14 ft.—7 in.	6 ft.—3½ in.	9 in.—21	lbs. 640 lbs.	90.00	.....	130.00
3	16 ft.—8 in.	7 ft.—4½ in.	10 in.—25	lbs. 780 lbs.	100.00	.....	140.00
3	20 ft.—0 in.	7 ft.—4½ in.	12 in.—31½	lbs. 1,000 lbs.	120.00	.....	160.00

The tie rod connections are designed to allow a moderate variation in the dimensions M without bending rod.

The hinge plates will be drilled for bolting on wall without extra charge if drawing showing location of holes is supplied, otherwise plates will be left for purchaser to drill holes as required.

BROWNHOIST TRAVELING CRANES

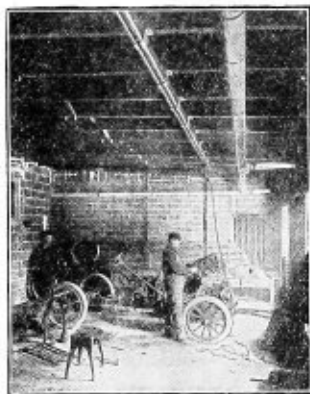


FIG. 4723

When equipped with Brownhoist trolleys for cross travel and Yale Spur-gear Hoists or Yale Electric Hoists, they cover the entire floor space and enable economical handling of material. Prices upon application.

WAGNER OVERHEAD CARRIERS AND HOISTS

Make Lifting and Carrying Easy for Garages,
Warehouses and Industrial Plants.

**FIG. 4724**

Showing how the engine is being carried from the automobile to the work bench with Wagner Carrier and one man.

No 1200

**FIG. 4725**

No. 1200. Roller Bearing Carrier. Capacity
2,000 lbs.Price each \$11.50

No. 1000

**FIG. 4726**

No. 1000. Roller Bearing Carrier. Capacity
600 lbs.Price each \$7.30

See following page for Track.

CENTER PULL TRIPLE SHEAVE HOISTS

Hoist

**FIG. 4727**

With Automatic Lock For Holding Load Suspended.

All center pull triple sheave hoists are used in connection with these carriers. By using the safety lock or self-operating clamp, one man can handle a load weighing up to 700 pounds. All center pull, triple sheave safety hoists are furnished.

No. 30 Hoist, capacity 2,000 lbs. List price without rope, each \$ 5.50

No. 60 Hoist, capacity 4,000 lbs. List price without rope, each 8.20

No. 90 Hoist, capacity 8,000 lbs. List price without rope, each 14.50

WAGNER OVERHEAD CARRIERS AND HOISTS

-CONTINUED

Track No. 25



FIG. 4728

Full size section Wagner Hawkeye Track No. 25, made of 12-gage tough carbon steel. Absolutely self-cleaning per foot \$0.92

Track Brackets



FIG. 4729

For attaching track to wall or ceiling.

Nos. 1, 2, 3 and 5.....	each	\$0.91
Nos. 4 and 6	each	1.82

For loads up to 600 lbs. space brackets $2\frac{1}{2}$ ft. apart.

For loads up to 2,000 lbs. space brackets 3 ft. apart.

Prices on curves and carriers for same on application.

4 TON YALE ELECTRIC HOIST

K-Y TYPE: 3 H. P.

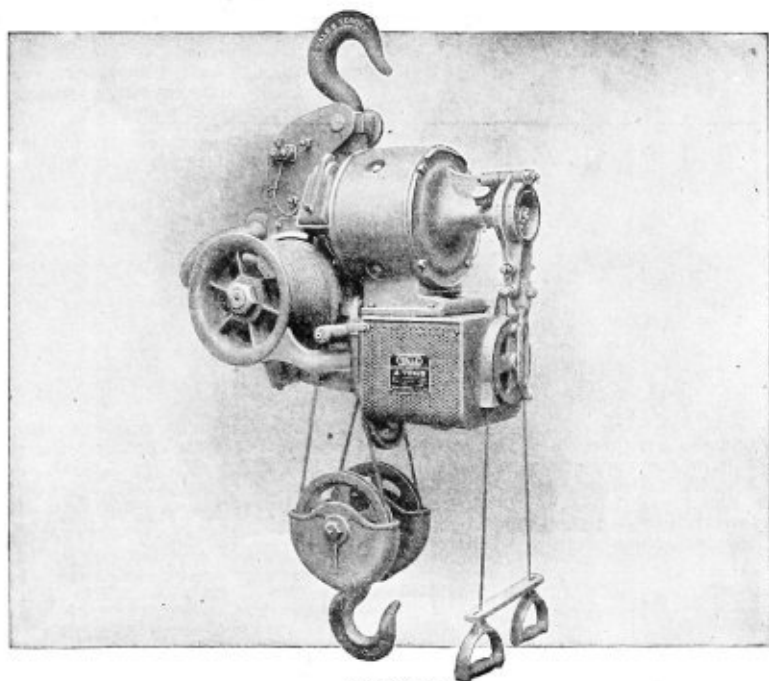


FIG. 4730

This hoist lifts the load on four parts of plough steel rope. The moving parts are few, strong and simple. Standard for direct current 110, 220, and 500 volts with plain control. Standard for alternating current, single speed control 220 volts, two or three phase sixty cycles and 440 volts three phase sixty cycles.

Not supplied for single phase.

Cap. in Tons	Current	Hoisting F.P.M.		Lift in Feet		Minimum Distance Between Hooks	Standard Weight	Price with Std. Lift and Plain Control
		Loaded	Light	Stan'd	Max'm			
4	Direct	8	20	15	22	57 in.	790 lbs.	On
4	Alternating	7½	8½	15	22	54 in.	740 lbs.	application

The graduated speed foundry controller can be supplied for direct current only.

YALE ELECTRIC CHAIN HOIST

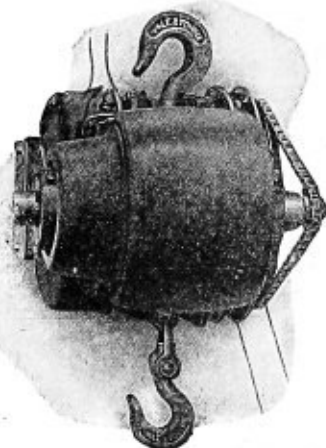


FIG. 4731

This hoist takes the place of a chain block at moderate additional cost, and gives from five to ten times the speed. Where any quantity of material from 50 to 4,000 pounds has to be repeatedly lifted and lowered, as in serving machine tools, this is the hoist to use. It is well adapted for use on trolley tracks, for attachment to small traveling cranes, or for lashing to shear poles.

It is a compact and simple power hoist made up of the regular Yale Spur-gear Block with a motor attached. The 1-ton Electric Chain hoist is made up of the 2-ton block, and the $\frac{1}{2}$ -ton Electric Chain Hoist is made up of the 1-ton block.

In the case of electric power failing, this hoist may be operated with a hand chain. It enables a lifting speed of 5 to 10 times that obtainable by hand, and is safe with an unskilled operator. A quick-acting brake is supplied as well as an automatic emergency stop to prevent over-travel of the hook.

The installation involves simply hooking the hoist onto a firm support and attaching wires for current. It is then ready to do the work of five men.

The Yale Electric Chain Hoist can be furnished for use on 110, 220 and 500 volts direct and 220 volts, two or three phase sixty cycles and 440 volts three phase sixty cycles alternating current.

Single phase hoists are not furnished.

Capacity	Dimensions			Minimum Headroom Clevis Connection	Stand- ard Lift	Net Weight	Price		Extra Lift
	Min. Dist. Between Hooks Full Load	Overall Width D C	Overall Length				Hoist with Standard Lift		
							Direct Current	Alternating Current	
							Prices on application		
$\frac{1}{2}$ Ton	20 in.	16 $\frac{1}{4}$ in.	33 $\frac{1}{2}$ in.	22 in.	10 ft.	230 lbs.			
1 Ton	25 in.	18 $\frac{3}{4}$ in.	38 $\frac{1}{4}$ in.	28 in.	10 ft.	360 lbs.			
2 Ton	32 in.	18 $\frac{3}{4}$ in.	38 $\frac{1}{4}$ in.	35 in.	10 ft.	410 lbs.			

The 1 and 2 Ton Hoist for Direct Current service can be furnished with a variable speed controlled at an additional price.

Note—When Geared Trolley is used add \$20.00 to list price of Standard Geared Trolley.

HOISTING SPEEDS

Capacity	Direct Current				Alternating Current		
	Hoisting			Lowering	Hoisting	Lowering	
	No Load	Half Load	Full Load				
$\frac{1}{2}$ Ton	30 F.P.M.	22 F.P.M.	18 F.P.M.	27 F.P.M.	16 F.P.M.	17 F.P.M.	
1 Ton	33 F.P.M.	24 F.P.M.	18 F.P.M.	28 F.P.M.	16 F.P.M.	17 F.P.M.	
2 Ton	16 $\frac{1}{2}$ F.P.M.	12 F.P.M.	9 F.P.M.	14 F.P.M.	8 F.P.M.	9 F.P.M.	

†Clevis connected hoists—the headroom given is minimum distance from bottom of I-Beam to bearing surface of hook including trolley.

CRANE AND HOIST, PORTABLE

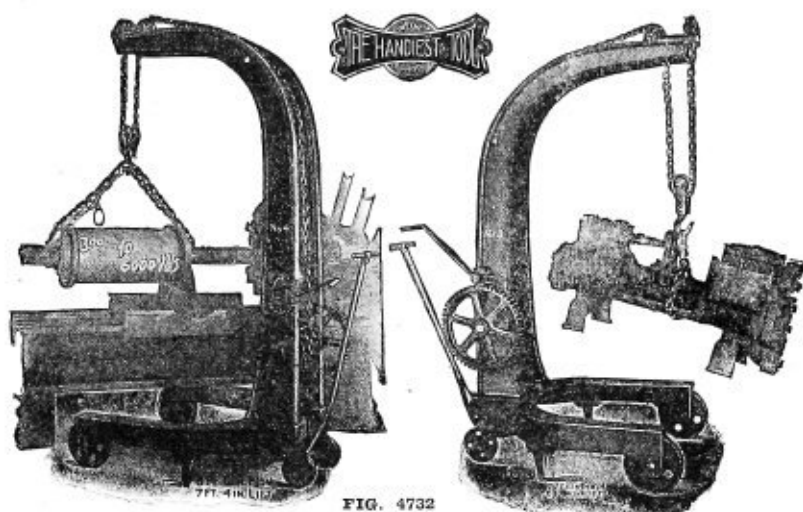


FIG. 4732

The "Handiest Tool in the Shop." Portable floor crane and hoist. Speaks for itself. Easily operated and moved to any part of your shop by a man.

Pays for itself in hundreds of machine shops every month, and in many other factories every year.

Few shops can afford to be without it. Save useless expenditures by getting one quickly.

With it one man does the work of twenty. It easily goes into every nook and crook of a factory often lifting and conveying heavy pieces in limited space where there is not room for more than one man.

Stiffest possible construction, a combination of cast iron and steel.

No user would part with it for twice its cost if he could not get another.

Select your size by dimensions. Consider lifting capacity last.

Size No.	Total Height, Ft. In.	Lift. Ft. In.	Over Hang, Ft. In.	Width of Bed		Length Bed, Ft. In.	Height of Bed, Inches	Lifting Capacity, Lbs.	Wght. Lbs.	List Price
				Outside, Ft. In.	Inside, Ft. In.					
1	5 8	4 6	2 3	2 5	1 10	2 11	9	2000	600	\$100.00
*2	6 6	5 4	2 6	2 8	2 1	3 2	12	4000	740	112.50
*3	7 6	6 4	2 9	2 10	2 4	3 9	12	5000	890	125.00
*4	8 6	7 4	3 0	3 4	2 8	4 0	12	6000	1150	150.00
*5	9 6	8 3	3 3	3 8	3 0	4 3	12	6500	1300	162.50
6	10 6	9 3	3 6	4 0	3 4	4 6	12	7000	1550	175.00
7	11 6	10 3	3 9	4 5	3 8	4 9	12	7000	1800	187.50
8	12 6	11 3	4 0	4 10½	4 1½	5 1	12	7000	2000	200.00

*We also furnish these numbers with low beds, 6¼ inches high at same price.

SPECIALS AS FOLLOWS

2S	6 6	5 4	2 6	3 8	3 0	3 3	6¼	4000	740	\$112.50
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*Most useful sizes for average shop.

HAND POWERS

NO. 19 SINGLE DRUM HAND POWER HOIST

Single purchase. Wood frame. Cast iron drum and gears. Capacity for two men.

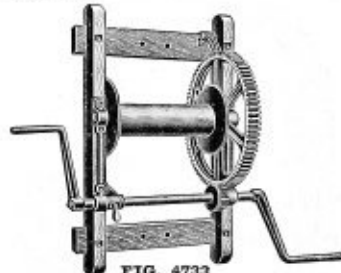


FIG. 4733

Order No.	Diam. and Length of Drum	Diameter of Gear and Pinion	Lift Two Men Single Line Lbs.	Speed of Rope Ft. per Min. on Drum	Price
6323	5x12	14 and 2½	500	8	\$44.00
6324	4x16	16 and 4	1,200	7½	44.00
6325	4x16	24 and 4	1,350	5½	46.00
6326	4x24	24 and 4	1,350	5½	50.00
6327	6x21	24 and 4	900	7½	50.00

NO. 20 SINGLE DRUM HAND POWER HOIST

Single purchase. Wood frame. Cast iron drum and gears. Capacity for four men.

Order No.	Diameter and Length of Drum	Diameter of Gear and Pinion	Lift Two Men Single Line Lbs.	Speed of Rope Feet per Min. on Drum	Price
6330	6x21	28 and 4	2,000	6¾	\$60.00
6332	6x30	28 and 4	2,000	6¾	66.00
6333	9x16	28 and 4	1,500	10	60.00
6334	9x21	28 and 4	1,500	10	64.00

No. 14

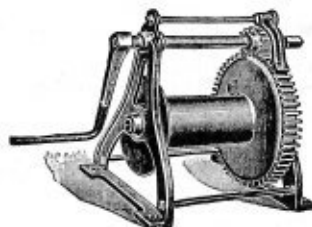


FIG. 4734

No. 19½

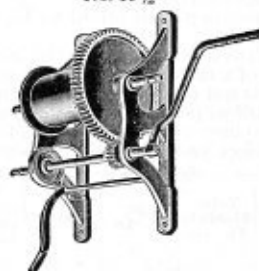


FIG. 4735

NO. 14 ONE MAN WINCH. CAPACITY 500 LBS.

Order No.	Diameter and Length of Drum	Diameter of Gear and Pinion	Price
6320	5x12	14 and 2½	\$25.00

NO. 19½ HAND POWER

Single drum, single purchase, with brake.

Order No.	Diameter and Length of Drum	Diameter of Gear and Pinion	Lift Two Men with Single Line	Speed of Rope Ft. Per Min. on Drum	Price
6321	6x16	16 and 4	600 lbs.	15½	\$50.00

No. 14½, Single Purchase

No. 15½, Double Purchase

HAND WINCHES

NOS. 141-2 AND 151-2
CAST IRON TRUCK WINCHES

FIG. 4736

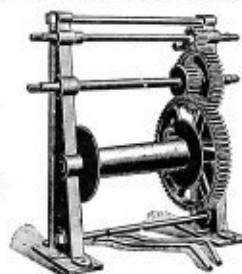


FIG. 4737

Single and double purchase. Capacity for two men.

Order No.	Diameter and Length of Drum	Diameter of Gear and Pinion	Pull with One Man Lbs.	Price Each
6288	Single Geared, 4x16	16 and 4½	600	\$50.00
6289	Double Geared, 4x16	16, 9½ and 3	1,400	75.00

NO. 15 HAND POWER PORTABLE WINCH

Concave drum, double purchase. Wood frame, cast iron drum and gears. Capacity for four men.

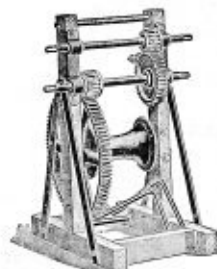


FIG. 4738

Order No.	Diameter and Length of Drum	Diameter of Gears and Pinions	Pull of Two Men on Single Line	Speed of Rope Feet Per Min. on Drum	Price
6293	4½x12	24, 9 and 4	3,000	2¾	\$80.00
6294	6 x18	24, 9 and 4	2,250	3¾	90.00

NO. 181-2 HAND POWER PORTABLE WINCH

Concave drum, single purchase. Wood frame, cast iron drum and gears. Capacity for two men.

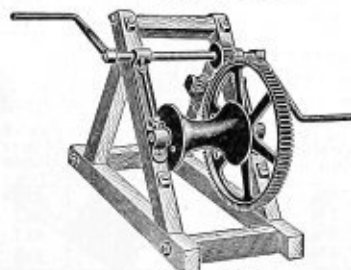


FIG. 4739

Order No.	Diam. and Length of Drum	Diameter of Gear and Pinion	Pull of Two Men on Single Line	Speed of Rope Feet Per Min. on Drum	Price
6295	4½x12	24 and 4½	1,600 lbs.	6¾	\$50.00
6296	6 x21	28 and 4	2,000 lbs.	6¾	70.00

HAND WINCHES

NO. 17, HAND POWER PORTABLE WINCH DOUBLE PURCHASE

Double purchase with brake. Wood frame, cast iron drum and gears. Capacity for four men.



FIG. 4740

Order No.	Diameter and Length of Drum	Diameter of Gears and Pinions	Pull of Two Men on Single Line, Lbs.	Speed of Rope Feet Per Min. on Drum	Price
6311	6x21	28, 18 and 4	7,500	1½	\$140.00
6313	6x30	28, 18 and 4	7,500	1½	160.00
6314	9x16	28, 18 and 4	5,000	2¼	140.00
6315	9x21	28, 18 and 4	5,000	2¼	150.00

Note—Above capacities are for slow speed. Fast speed will lift one-quarter the above capacities at four times the speed.



FIG. 4741

NO. 10, SINGLE PURCHASE HAND POWER WINCH

Cast iron frame, single drum with brake. Capacity for four men.

Order No.	Diameter and Length of Drum	Diameter of Gears and Pinions	Pull of Two Men on Single Line, Pounds	Speed of Rope Feet Per Min. on Drum	Price	Extra for Nigger Heads on Drum Shaft, Each	Size of Nigger Heads
6250	4½x12	18 and 6	900	12	\$58.00	\$14.00	4x6
6252	4½x16	24 and 4	1,800	6	72.00	16.00	4x6
6253	5 x18	25 and 4	2,500	6½	90.00	17.00	4x6

NO. 11, DOUBLE PURCHASE HAND POWER WINCH

Cast iron frame, single drum with brake. Capacity for four men.

Order No.	Diameter and Length of Drum	Diameter of Gears and Pinions	Pull of Two Men on Single Line, Pounds	Speed of Rope Feet Per Min. on Drum	Price	Extra for Nigger Heads on Drum Shaft, Each	Size of Nigger Heads
6258	4½x16	24, 9 and 4	3,000	2¾	\$ 84.00	\$ 17.00	4x6
6260	5 x19	27, 13½ and 4	4,500	1¾	122.00	19.00	6x7
6262	6½x22	33, 13½ and 5½	5,000	3½	150.00	20.00	6x7
6263	9 x16	25, 8¼ and 4	3,000	5½	120.00	17.00	4x6

Extra for Machine with Wheel Brake, add \$10.00 to list price.

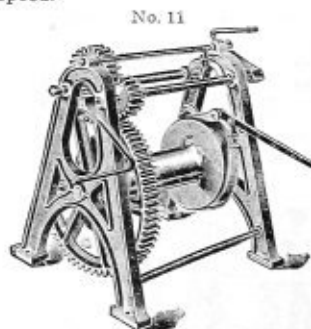


FIG. 4742

HAND WINCHES

NO. 21 SINGLE DRUM HAND POWER HOIST

Double purchase, with brake. Cast iron frame, drum and gears. Capacity for four men.

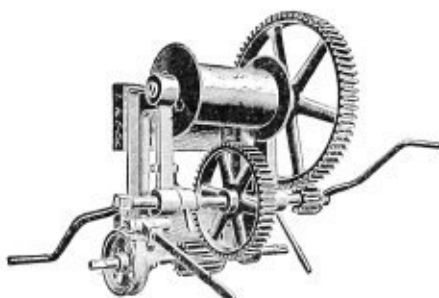


FIG. 4743

Order No.	Diameter and Length of Drum	Diameter of Gears and Pinions	Lift Two Men Single Line, Lbs.	Speed of Rope Feet Per Min. on Drum	Price
6370	6x21	28, 18 and 4	7,500	1½	\$120.00
6371	6x26	28, 18 and 4	7,500	1½	126.00
6372	9x16	28, 18 and 4	5,000	2¼	120.00
6373	9x21	28, 18 and 4	5,000	2¼	126.00

Note—Above capacities are for slow speed. Fast speed will lift one-quarter the above capacities at four times the speed.

NO. 13 DOUBLE PURCHASE HAND POWER WINCH

Single drum with brake. Steel plate sides, cast iron drum and gears. Capacity for four men.



FIG. 4744

Order No.	Diameter and Length of Drum	Diameter of Gears and Pinions	Pull of Two Men on Single Line Lbs.	Speed of Rope Feet Per Min. on Drum	Price
62785	x19	27, 13½ and 4	4,500	1¾	\$148.00
62806	½x22	33, 13½ and 5½	5,000	3½	200.00
62819	x16	25, 8¼ and 4	3,000	5½	150.00
62849	x21	28, 10 and 4	4,700	4	200.00

HAND POWERS
HAND POWER, BREAST DERRICK
CAPACITY, TWO TONS



FIG. 4745

Order No.	Size of Timber	Height, Feet	Size of Drum	List Price, Each
6420	6x6	16	4 1/2 x 39	\$120.00
6421	6x6	20	4 1/2 x 39	132.00
6422	6x6	24	6 1/2 x 39	148.00
6423	6x6	28	6 1/2 x 39	168.00

HAND POWER POLE DERRICK
CAPACITY, 3,000 LBS.



FIG. 4746

Order No.	Size of Pole	Height in Feet	List Price, Each
6415	6x6	16	\$ 80.00
6416	6x8	20	88.00
6417	8x8	24	96.00
6418	8x8	28	108.00

Price does not include rope and rope fittings.

SULKY DERRICK
ESPECIALLY ADAPTED FOR LAYING PIPE, SETTING
SEWER CASTINGS, ETC.

FITTED WITH BRAKE FOR LOWERING



FIG. 4747

Order No.	Size of Timbers	Height, Feet	Capacity	List Price, Including Blocks and Rope
6429	4x4	12	3,500	\$160.00
6430	4x6	12	10,000	200.00

NOTE—No. 6429 has Two Single Blocks.

No. 6430 has Two Double Blocks.

HAND POWERS

NO. 24 DOUBLE DRUM HAND POWER HOIST

Double purchase, with brake. Cast iron frame, drum and gears. To change gear from one drum to the other, dog the gears and slide crank shaft. Capacity for four men.

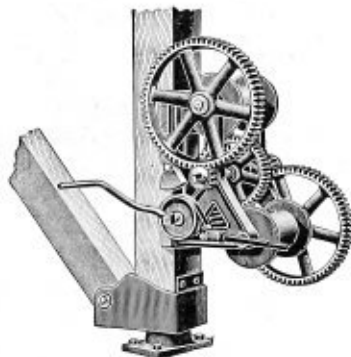


FIG. 4748

Order No.	Diameter and Length of Drums	Diameter of Gears and Pinions	Lift Two Men Single Line Lbs.	Speed of Rope Ft. Per Min. on Drum	Price
6393	6x21	28, 18 and 4	7,500	1½	\$150.00
6394	6x26	28, 18 and 4	7,500	1½	160.00
6395	9x16	28, 18 and 4	5,000	2¼	150.00
6396	9x21	28, 18 and 4	5,000	2¼	160.00

Note—Above capacities are for slow speed. High speed will lift one-quarter the above capacities at four times the speed.

NO. 17½ SAFETY WORM-GEARED WINCHES

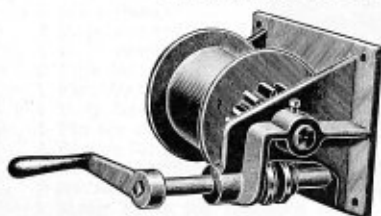


FIG. 4749

Especially adapted for conditions where it is necessary for the load to remain suspended, such as cluster lights, sliding doors, skylights, etc.

The load cannot run down.

In lowering, the handle must be turned.

No pawl used.

Order No.	Diameter and Length of Drum	Worm and Gears	Capacity, Lbs.	Price
6316	5½x 6	Cut	1,500	\$55.00
6317	8 x 10½	Cast	500	30.00
6318	5½x 6	Cast	300	18.00
6319	5½x 6	Cast	500	24.00

Other sizes with cut worm and gear built to order.

SINGLE DRUM HORSE-POWER HOISTING MACHINES

ONE-HORSE CAPACITY-ONE SPEED

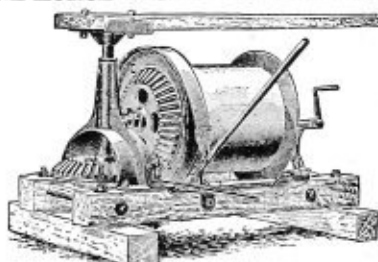


FIG. 4750

Order No.	Machine No.	Size of Drum	Teeth in Gears	Weight Hoisted Single Rope	Speed of Single Rope per Minute	Size of Bed Frame	Weight Pounds	Price
7412	1½	20 x 22	20 and 43	5000	11	33 x 63	1500	\$240.00
7413	2	20 x 22	36 and 36	2500	22	33 x 63	1400	200.00
7414	2½	20 x 22	39 and 26	1700	33	36 x 63	1400	200.00
7415	3	20 x 22	45 and 18	1000	55	39 x 63	1400	200.00

HORSE-POWER HOISTING MACHINE, No. 4

SINGLE DRUM, DOUBLE SPEED-ONE-HORSE CAPACITY

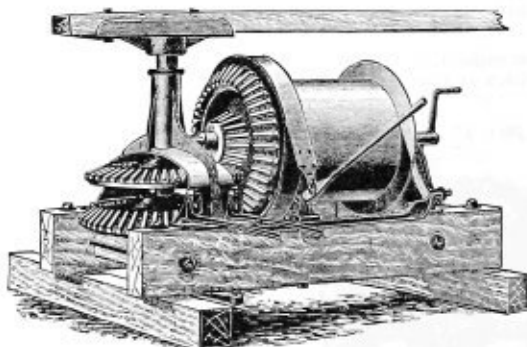


FIG. 4751

Order No.	7418
Size of drum	20x22
Teeth in gears.....	42 and 42 45 and 18
Weight hoisted, single rope; fast speed, 1,000 pounds.....	at 55 feet per minute
Weight hoisted, single rope; slow speed, 2,500 pounds.....	at 22 feet per minute
Size of bed frame.....	39x72
Weight	2,000 pounds
Price	\$320.00

STIFF LEG HAND POWER DERRICK No. 30

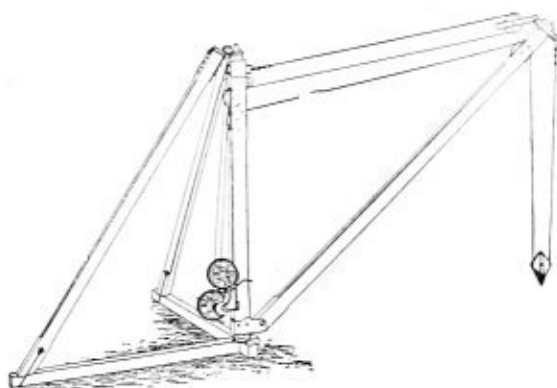


FIG. 4752

STIFF LEG HAND POWER DERRICK NO. 30

Mast Size	inches	10	12	14	16
Order Number		800	801	802	803

LIST OF FITTINGS

CATALOGUE NUMBER

1 Standard Foot Block.....	917	919	921	924
1 Plain Step	954	954	955	955
1 Mast Top	1002	1003	1004	1005
1 Idler Sheave and Boxes.....	2507	2507	2507	2507
1 B. B. Sheave for Top of Mast.....	2090	2108	2138	2170
1 B. B. Sheave for Top of Mast.....	2064	2072	2108	2138
2 Pins for Sheaves.....	1199	1201	1202	1202
1 Flat Boom Band.....	1067	1069	1070	1071
1 B. B. Sheave for Point of Boom.....	2064	2108	2138	2138
1 Pin for Sheave.....	1199	1201	1202	1202
2 Straps for Top of Legs.....	1142	1443	1144	1145
2 Straps for Bottom of Legs.....	1155	1156	1157	1158
1 Swivel Hook Hoisting Block.....	1565	1567	1576	1584
1 Strap Block for Hoisting Line	*...	1386	1390	1446
1 Strap Block for Mast Top.....	1384	1393	1447	1456
1 Strap Block for Boom	1385	1393	1447	1456
Price of Fittings.....	\$267.88	428.10	721.40	1071.20
Capacity in Tons.....	3	5	10	15
Parts of Lines in Topping	4	5	7	7
Parts of Lines for Load	2	3	4	5

For capacity of timber, see page 1697. *Not required.

Prices are for Fittings only and do not include Hand Power Hoist, Timber and Rope.

HAND POWER GUY DERRICK, NO. 32

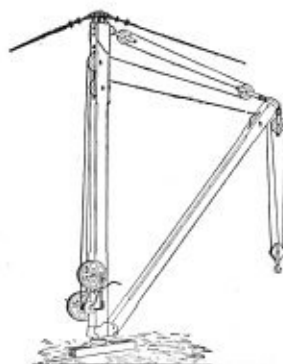


FIG. 4753

Mast size, inches.....	10	12	14	16
Order Number	810	811	812	813
List of Fittings		Catalogue Number		
1 Standard Foot Block	917	919	921	924
1 Plain Step	954	954	955	955
1 Mast Top	1002	1003	1004	1005
1 B. E. Sheave for Top of Mast	2090	2108	2138	2170
1 B. E. Sheave for Top of Mast	2064	2072	2108	2138
2 Pin Sheaves	1199	1201	1202	1202
1 Guy Cap	1119	1120	1121	1122
1 Flat Boom Band	1067	1069	1070	1071
1 B. E. Sheave for Point of Boom	2064	2108	2138	2138
1 Pin for Sheave	1199	1201	1202	1202
1 Swivel Hook Hoisting Block	1565	1574	1584	1593
1 Strap Block for Hoisting Line	1384	1388	1400	1440
1 Strap Block for Boom	1384	1397	1447	1452
1 Str. Block for Mast Top	1385	1397	1447	1452
Price of Fittings.....	\$235.78	\$385.60	\$645.90	\$862.70
Capacity in Tons.....	5	10	15	20
Parts of Lines in Topping	4	5	7	7
Parts of Lines for Load	3	4	5	6

GUY DERRICK NO. 39

With Bull Wheel and Rooster. Rigged for Bucket Work. Operated by
Three-Drum Hoist and Swinger.



FIG. 4754

Mast Size, inches.....	12	14	16	18
Order No.	835	836	837	838
List of Fittings		Catalogue Number		
1 Offset Foot Block.....	933	935	936	937
1 Step with 2 Sheaves.....	976	977	977	978
1 Mast Top with Rooster....	1037	1038	1039	1040
1 Bracket with 2 Sheaves....	1362	1368	1368	1371
1 Steel Point Boom.....	1097	1098	1099	1100
1 Set Boom Heel Plates.....	1186	1187	1188	1189
1 Steel Bull Wheel.....	903	904	905	906
2 Fair Lender Sheaves.....	1293	1294	1294	1295
Price of Fittings.....	\$799.80	\$964.00	\$1367.00	\$1643.50
Clam Shell Bucket, Capacity, Cu. Yds.	1½	2½	4	5
Parts of Lines in Topping...	4	4	5	5

STIFF LEG DERRICK No. 40

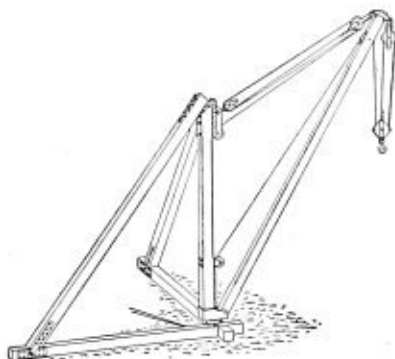


FIG. 4755

STIFF LEG DERRICK NO. 40

For Double-Drum Hoist

Mast Size	10	12	14	16
Order Number	840	841	842	843

LIST OF FITTINGS

CATALOGUE NUMBER

1 Offset Foot Block.....	932	933	935	936
1 Step with Two Sheaves.....	975½	976	977	977
1 Steel Mast Top	1024	1025	1026	1027
1 Bracket with Two Sheaves.....	1356	1362	1368	1368
1 Flat Boom Band.....	1067	1069	1070	1071
1 B. B. Sheave for Point of Boom.....	2072	2108	2138	2138
1 Pin for Sheave.....	1199	1201	1202	1202
2 Straps for Top of Legs.....	1142	1143	1144	1145
2 Sets of Plates for Bottom of Legs.....	1160	1161	1162	1163
1 Swivel Hook Hoisting Block.....	1563	1567	1575	1584
1 Strap Block for Hoisting Line.....	*	1386	1390	1399
1 Strap Block for Boom	1384	1393	1446	1456
1 Strap Block for Mast Top.....	1384	1393	1446	1455
Prices of Fittings.....	\$339.80	510.50	759.90	1087.70
Capacity in Tons.....	3	5	10	15
Parts of Lines in Topping	4	5	5	6
Parts of Lines for Load	2	3	3	4

*Not required.

For capacity of timber, see page 1697. Prices are for fittings only.

NO. 41 STIFF LEG DERRICK

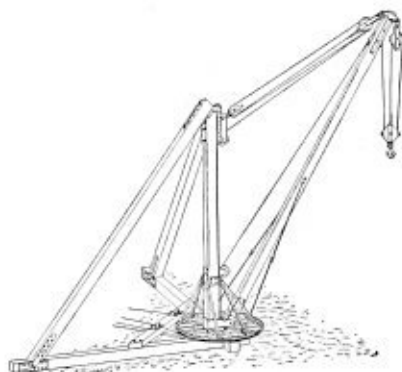


FIG. 4755-A

For General Hoisting

Operated by Double-Drum Hoist and Swinger

Mast Size	12	14	16	18
Order Number	845	846	847	848

LIST OF FITTINGS

CATALOGUE NUMBER

1 Foot Block	935	935	936	937
1 Step with 2 Sheaves.....	976	977	977	978
1 Steel Mast Top	1025	1026	1027	1028
1 Bracket with 2 Sheaves.....	1362	1363	1368	1371
1 Forged Boom Band.....	1080	1081	1082	1083
1 Set Boom Heel Plates.....	1186	1187	1188	1189
2 Straps for Top of Legs.....	1143	1144	1145	1146
2 Sets Bottom Plates	1161	1162	1163	1164
1 Steel Bull Wheel	903	904	905	906
2 Fair Leader Sheaves.....	1293	1294	1294	1295
1 Swivel Hook Hoisting Block.....	1567	1575	1584	1590
1 Strap Block for Load.....	1386	1390	1399	1405
1 Strap Block for Boom.....	1393	1446	1456	1461
1 Strap Block for Mast Top.....	1393	1446	1455	1461
1 Boom Sheave	2108	2138	2138	2170
Price of Fittings.....	\$869.70	1180.80	1779.80	2384.90
Capacity in Tons.....	5	10	15	20
Parts of Lines in Topping	5	5	6	7
Parts of Lines for Load	3	3	4	4

For capacity of timber, see page 1697. Prices are for Fittings only.

"A" FRAME DERRICK CAR NO. 47

STEAM OPERATED. RIGGED FOR GENERAL HOISTING

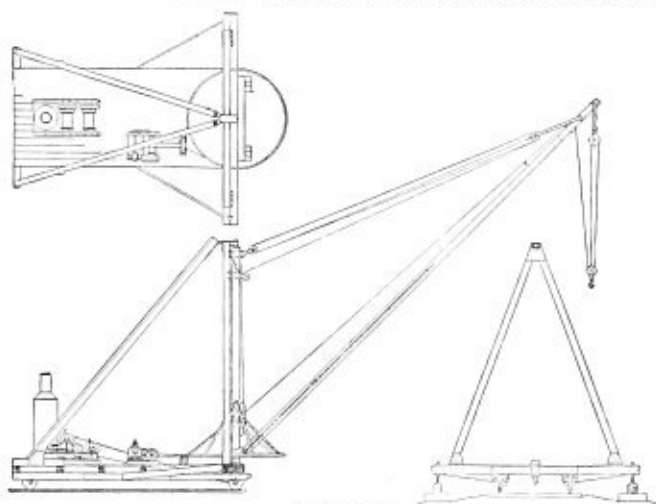


FIG. 4756

Capacity in Tons	Size of Mast Fittings Inches	Size of Timber and Maximum Length of Boom for Capacities Given			
		Mast	Boom	"A" Frame	Back Legs
3	12	12x12	10x10x60	10x10	8x8
5	14	14x14	12x12x66	12x12	10x10
7	16	16x16	14x14x66	14x14	12x12
12	18	18x18	16x16x62	16x16	14x14
Mast Size, Inches.....		12	14	16	18
Order Number.....		879	871	872	873
List of Fittings		Catalogue Number			
1 Standard Foot Block.....		919	921	924	925
1 Step with Two Sheaves.....		976	977	977	978
1 Round Mast Top.....		996	997	998	999
1 Structural Bracket for Face of Mast.....		1301	1304	1307	1310
1 Bracket with One Sheave.....		1361	1367	1367	1370
1 Steel Boom End Plate.....		1092	1093	1094	1095
1 Set Boom End Plates.....		1186	1187	1188	1189
1 Steel Bull Wheel.....		903	904	905	906
2 Fair Leader Sheaves.....		1293	1294	1294	1295
1 "A" Frame Head.....		1111	1112	1113	1114
2 Sets Bottom "A" Frame Plates.....		1173	1174	1175	1176
2 Straps for Top of Legs.....		1142	1143	1144	1145
2 Sets of Plates for Bottom of Legs.....		1177	1178	1179	1180
1 Swivel Hook Hoisting Block.....		1563	1567	1571	1581
1 Shackle Block for Hoisting Line.....		*	1729	1735	1741
1 Strap Block for Boom.....		1392	1403	1446	1461
4 Double Flange Car Wheels and Axles.....		3187	3190	3191	3191
8 Journal Boxes with Brass Liners.....		3213	3214	3215	3215
2 Jack Screws.....		1115	1115	1115	1115
Price of Fittings.....		\$1280.90	\$1725.30	\$2511.30	\$3202.50
Capacity in Tons.....		3	5	7	12
Parts of Lines in Topping.....		4	5	7	12
Parts of Lines in Load.....		2	3	3	4

*Not required.

BULL WHEELS

We show here two types of bull wheels. Both are made in two pieces and are easily attached to derrick after mast and boom are in place and rigged.

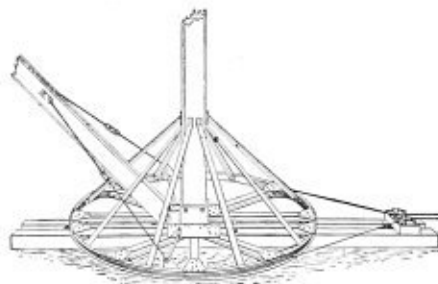


FIG. 4757

STEEL BULL WHEEL

Order No.	Diameter of Wheel, Feet	Price
900	5	\$200.00
901	8	210.00
902	10	240.00
903	12	300.00
903H	12	400.00
904	14	350.00
904H	14	500.00
905	16	600.00
906	18	680.00
907	20	800.00

Price does not include Foot Block, Guide Sheaves and Timber.

WOOD CENTER BULL WHEEL WITH STEEL RIM

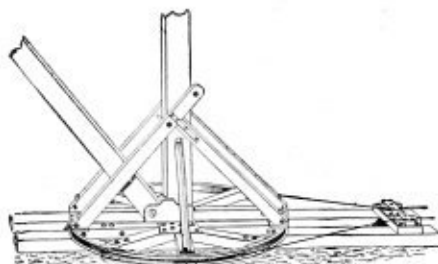


FIG. 4758

COMPLETE WHEEL

IRON WORK ONLY

Order No.	Diameter of Wheel, ft.	Price	Order No.	Diameter of Wheel, Feet	Price
908	8	\$170.00	908R	8	\$100.00
909	10	180.00	909R	10	110.00
910	12	200.00	910R	12	120.00
911	14	220.00	911R	14	130.00
912	16	250.00	912R	16	150.00

Price is for Bull Wheel only and does not include Foot Block, Guide Sheaves or Timber in Mast, Boom and Stringers.

CAPACITIES OF TIMBER DERRICKS

BOOM HORIZONTAL

LENGTHS MAXIMUM FOR UNTRUSSED TIMBER

STIFF LEG DERRICKS

Capacity Tons	Size Mast Fittings	Size Mast	Size Boom	Size Boom and Back Leg Irons	Capacity Clam Shell
3	10	10 x 10 x 24	8 x 8 x 36	8	
2	10	10 x 10 x 18	8 x 8 x 36	8	
3	10	12 x 12 x 30	10 x 10 x 44	8	
2	10	12 x 12 x 22	10 x 10 x 44	8	
5	12	12 x 12 x 28	10 x 10 x 42	10	1 1/4
4	12	12 x 12 x 22	10 x 10 x 42	10	3/4
5	12	14 x 14 x 32	12 x 12 x 50	10	1 1/4
4	12	14 x 14 x 24	12 x 12 x 50	10	3/4
10	14	14 x 14 x 28	12 x 12 x 42	12	2
7	14	14 x 14 x 24	12 x 12 x 48	12	1 1/2
10	14	16 x 16 x 38	14 x 14 x 56	12	2
7	14	16 x 16 x 28	14 x 14 x 56	12	1 1/2
15	16	16 x 16 x 28	14 x 14 x 42	14	2 1/2
10	16	16 x 16 x 26	14 x 14 x 54	14	2
15	16	18 x 18 x 42	16 x 16 x 62	14	2 1/2
10	16	18 x 18 x 32	16 x 16 x 62	14	2
20	18	18 x 18 x 28	16 x 16 x 42	16	4
15	18	18 x 18 x 28	16 x 16 x 56	16	3
20	18	20 x 20 x 46	18 x 18 x 68	16	4
15	18	20 x 20 x 34	18 x 18 x 68	16	3

GUY DERRICKS

5	10	10 x 10 x 44	8 x 8 x 36	8	...
5	10	12 x 12 x 52	10 x 10 x 46	8	...
10	12	12 x 12 x 36	10 x 10 x 30	10	1 1/2
10	12	14 x 14 x 60	12 x 12 x 52	10	1 1/2
15	14	14 x 14 x 36	12 x 12 x 30	12	2 1/2
15	14	16 x 16 x 64	14 x 14 x 56	12	2 1/2
20	16	16 x 16 x 36	14 x 14 x 30	14	4
20	16	18 x 18 x 62	16 x 16 x 54	14	4
30	18	18 x 18 x 44	16 x 16 x 38	16	5
30	18	20 x 20 x 68	18 x 18 x 60	16	5

DERRICK FITTINGS



FIG. 4759

STANDARD FOOT BLOCKS

Standard Foot Blocks have the step bearing in the center of the mast and are used with mast tops having the gudgeon pin also in line with the center. It is therefore necessary for the rope to lead through the center of the lower end of the mast into the step.

Order Number	Inside Measure in Inches		Diameter of Pintle	Price
	Mast	Boom		
915	7 1/2	5 1/2	6 1/2	\$18.50
916	7 1/2	7 1/2	6 1/2	22.00
917	9 1/2	7 1/2	8 1/2	25.00
918	9 1/2	9 1/2	8 1/2	27.00
919	11 1/2	9 1/2	8 1/2	36.00
920	11 1/2	11 1/2	8 1/2	40.00
921	13 1/2	11 1/2	11	48.00
922	13 1/2	13 1/2	11	54.00
923	14 1/2	14 1/2	11	60.00
924	15 1/2	13 1/2	11	65.00
925	17 1/2	15 1/2	11	100.00
926	22	20	15	125.00



FIG. 4760

OFFSET FOOT BLOCKS

Offset Foot Blocks have the step bearing between the mast and the boom, and the line leads up the face of the mast. With this foot block, an offset mast top is used which enables the mast to swing concentric with the bearings.

Order Number	Inside Measure in Inches		Diameter of Pintle	Price
	Mast	Boom		
930	5 1/2	5 1/2	6 1/2	\$18.00
931	7 1/2	7 1/2	6 1/2	22.00
932	9 1/2	7 1/2	8 1/2	33.00
933	11 1/2	9 1/2	8 1/2	48.00
934	11 1/2	11 1/2	8 1/2	52.00
935	13 1/2	11 1/2	11	68.00
935 1/2	13 1/2	13 1/2	11	72.00
936	15 1/2	13 1/2	11	90.00
937	17 1/2	15 1/2	11	120.00

BOX CASTINGS



FIG. 4761

Order No.	Diam. of Pintle	Inside Measure in Inches	Price
941	6 1/2	8 x 8	\$10.00
942	6 1/2	9 x 9	12.00
943	8 1/2	10 x 10	13.00
944	8 1/2	12 x 12	19.00
945	11	14 x 14	27.00

BOOM SEAT CASTINGS



FIG. 4762

Order No.	Size Mast	Inside Measure for Boom	Price
947	8	6	\$ 7.50
948	10	8	10.00
949	12	10	13.00
950	14	12	18.00
951	16	14	23.00

DERRICK FITTINGS

PLAIN STEPS



FIG. 4763

Order No.	Size of Plate Inches	Inside Diameter of Cup, Inches	Price
953	11 x18	6½	\$12.00
954	11½x19	8½	19.00
955	15 x27	11	35.00
956	19 x29	11	45.00

 MAST STEPS FOR ADJUSTABLE
STIFF LEG SILLS
Two Sheaves


FIG. 4764

Order No.	Inside Diameter of Cup, Inches	Size of Sheaves	Price
968	8½	14x2x2	\$64.00
969	11	16x2x2¼	96.00



FIG. 4765

MAST STEPS WITH ONE, TWO OR THREE SHEAVES

Size of Plate, Inches	Inside Diam. of Cup, Inches	Size of Sheaves	Single Sheave		Double Sheave		Triple Sheave	
			Order No.	Price	Order No.	Price	Order No.	Price
11 x18	6½	12x2x1½	970	\$20.00	975	\$26.00	...	.....
11½x19	8½	12x2x1½	970½	26.00	975½	32.00	...	.....
11½x19	8½	14x2x2	971	33.50	976	42.00	*981	\$45.00
15 x27	11	16x2x2¼	972	56.00	977	67.00	982	78.00
19 x29	11	18x2x2½	973	63.50	978	78.00	983	93.00
39 x39	15	22x3x3	974	136.00	979	160.00	...	.....

No. 981 has Sheaves 14x1½x2.



FIG. 4766

 COMBINED BASE AND STEP CASTING
WITH SHEAVES

Diam. of Base, Inches	Height Over All, Inches	Inside Diam. of Cup, Inches	Size of Sheaves	Single Sheave		Double Sheave	
				Order No.	Price	Order No.	Price
34	16	8½	14x2x2	988	\$85.00	989	\$95.00
38	17	11	16x2x2¼	990	115.00	991	127.00
60	25	15	22x3x3	992	340.00	993	364.00



FIG. 4767



FIG. 4768



FIG. 4769



FIG. 4770

DERRICK FITTINGS

ROUND CAST-IRON MAST TOPS WITH REMOVABLE STEEL GUDGEONS

Order No.	Inside Measure Inches	Diameter of Gudgeon Inches	Price
994	7½	2½	\$ 27.00
995	9½	3	35.00
996	11½	3½	65.00
997	13½	4	95.00
998	15½	4½	120.00
999	17½	5	160.00
1000	22	9	360.00

STANDARD CAST IRON MAST TOPS WITH REMOVABLE STEEL GUDGEONS

Order No.	Inside Measure Inches	Diameter of Gudgeon Inches	Price
1001	7½	2½	\$ 24.00
1002	9½	3	30.00
1003	11½	3½	55.00
1004	13½	4	85.00
1005	15½	4½	120.00

OFFSET MAST TOPS WITH REMOVABLE STEEL GUDGEONS

Structural Steel

Order No.	Size of Mast Inches	Diameter of Gudgeon Inches	Price
1012	8	2½	\$ 45.00
1013	10	3	57.60
1014	12	3½	69.60
1015	14	4	87.00
1016	16	4½	107.00

MAST TOPS WITH SIDE STRAPS AND SHEAVES FOR HAND POWER DERRICKS

Order No.	Inside Measure Inches	Diam. of Gudgeon Inches	Diam. of Sheaves Inches	Price
1006	7½	2½	12 and 10	\$ 53.00
1007	9½	3	14 and 12	68.00
1008	11½	3½	14 and 12	100.00
1009	13½	4	16 and 14	140.00
1010	15½	4½	18 and 16	210.00

DERRICK FITTINGS

STRUCTURAL STEEL MAST TOP WITH SHEAVE FOR BOOM LINE



FIG. 4771

Order No.	Size of Timber Inches	Diameter of Gudgeon Inches	Size of Sheave	Price
1024	10	3	12x2x1½	\$ 68.00
1025	12	3½	14x2x2	80.00
1026	14	4	16x2x2¼	100.00
1027	16	4½	16x2x2¼	120.00
1028	18	5	18x2x2½	150.00

Extra for Hollow Gudgeon, 3, 3½ and 4 inch, \$16.00 each; 4½ and 5 inch, \$20.00 each.

TOP FOR "A" FRAME DERRICK MAST WITH HOLLOW GUDGEON FOR LEAD OF TOPPING LINE FROM ROOSTER ON "A" FRAME

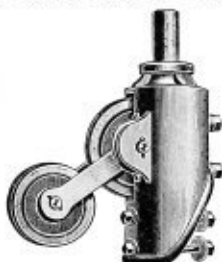


FIG. 4772

Order No.	Inside Diam. Inches	Mast Center Sheave	Topping Sheaves	Parts of Line in Topping	Price
1063	11½	1-18x2x2	2-14x2x2	5	\$122.50
1064	13½	1-18x2x2¼	2-16x2x2¼	5	165.00
1065	15½	1-20x2x2½	2-16x2x2¼	6	240.00
1066	17½	1-24x3x3	3-18x2x2½	7	350.00

TOPPING LINE CHAINS FOR MAST HEAD



FIG. 4773

Order Number	Size of Mast, Inches	Size of Links, Inches	Length Inches	Price
1055	8	¾	36	\$12.00
1055½	10	1	42	16.00
1056	12	1¼	42	21.00
1056½	14	1½	45	27.00
1062	16	1¾	48	35.00
1062½	18	2	54	48.00

DERRICK FITTINGS **STRUCTURAL STEEL MAST TOP AND GUY CAP WITH BOOM** **FALL SHEAVES**



FIG. 4774

Size of Timber Inches	Diameter of Gudgeon Inches	Size of Sheaves	Parts of Line in Topping
10	3	2-12x2x1½	4
12	3½	3-14x2x2	5
14	4	3-16x2x2¼	5
16	4½	3-16x2x2¼	6
18	5	4-18x2x2½	7

STRUCTURAL STEEL MAST TOP WITH STIFF LEG STRAPS AND ROOSTER

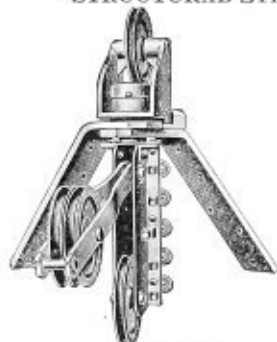


FIG. 4775

Size of Mast Inches	Diameter of Gudgeon Inches	Catalogue No. of Stiff Legs Straps	Size of Sheaves	Line in Parts of Topping
10	3	1142	2-12x2x1½	4
12	3½	1143	3-14x2x2	5
14	4	1144	3-16x2x2¼	5
16	4½	1145	3-16x2x2¼	6
18	5	1146	4-18x2x2½	7

Without Rooster		With Rooster	
Order No.	Price	Order No.	Price
1030	\$130.00	1036	\$187.00
1031	174.00	1037	231.00
1032	206.00	1038	263.00
1033	300.00	1039	361.00
1034	392.00	1040	452.00



FIG. 4776

SPLIT BAND WITH TWO LINKS

Order No.	Inside Diam. Inches	Price
1067	7½	\$25.00
1068	8½	27.00
1069	9½	30.00
1070	11½	37.50
1071	13½	54.00



FIG. 4777

OPEN BAND WITH ONE LINK

Order No.	Inside Diam. Inches	Price
1072	7½	\$18.00
1073	8½	20.00
1074	9½	24.00
1075	11½	30.00
1076	13½	40.00
1077	15½	60.00



FIG. 4778

BOOM BAND WITH WELDED EXTENSION TO SHEAVE PIN

Order No.	Inside Diam., In.	Diameter of Sheave Pin	Price
1078	7½	2 inch	\$ 40.00
1079	8½	2 inch	45.00
1080	9½	2 inch	50.00
1081	11½	2¼ inch	70.00
1082	13½	2¼ inch	95.00
1083	15½	2½ inch	130.00

DERRICK FITTINGS

Nos. 1084 to 1089



FIG. 4779

Nos. 1091 to 1095



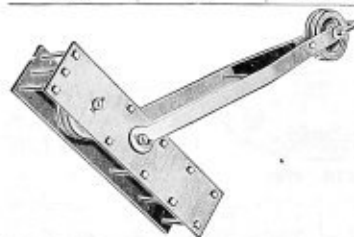
FIG. 4780

CAST-IRON BOOM POINT WITH BAILS AND SHEAVES

Order No.	Diam. Inside Inches	Boom Point Sheave	Load Bail Sheaves	Boom Bail Sheave	Parts of Line for Load	Parts of Line in Topping	Price
1084	7½	1-16x2x2	1-12x2x1½	2-12x2x1½	3	4	\$106.00
1085	9½	1-18x2x2	1-14x2x2	2-14x2x2	3	5	132.00
1086	11½	1-22x2x2¼	1-16x2x2¼	2-16x2x2¼	3	5	162.00
1087	13½	1-24x2x2¼	1-16x2x2¼	3-16x2x2¼	4	6	230.00
1088	15½	1-26x2x2½	1-18x2x2½	3-18x2x2½	4	7	280.00
1089	17½	1-28x3x2½	1-20x2x2½	3-20x2x2½	4	7	320.00

STEEL BOOM POINT FOR GENERAL HOISTING WITH BAIL AND SHEAVES FOR TOPPING AND LOAD BAIL

Order No.	Size of Timber Inches	Load Line Sheave	Boom Bail Sheaves	Parts of Line in Topping	Price
1091	8	1-12x2x1½	2-12x2x1½	4	\$110.00
1092	10	1-14x2x2	2-14x2x2	5	132.00
1093	12	1-16x2x2¼	2-16x2x2¼	5	170.00
1094	14	1-16x2x2¼	3-16x2x2¼	6	220.00
1095	16	1-18x2x2½	3-18x2x2½	7	300.00



STEEL BOOM POINT FOR BUCKET WORK WITH BAIL AND SHEAVES FOR TOPPING

FIG. 4781

Order No.	Size of Timber Inches	Bucket Line Sheaves	Boom Bail Sheaves	Parts of Line in Topping	Price
1097	10	2-14x2x2	2-14x2x2	4	\$110.00
1098	12	2-16x2x2¼	2-16x2x2¼	4	140.00
1099	14	2-16x2x2¼	2-16x2x2¼	5	160.00
1100	16	2-18x2x2½	2-18x2x2½	5	200.00

DERRICK FITTINGS

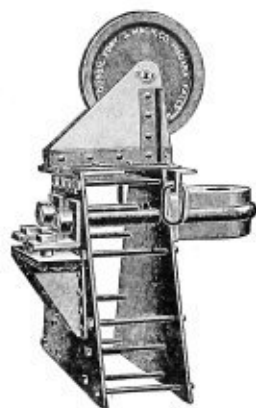


FIG. 4782

"A" FRAME HEAD WITH ROOSTER AND
WITH DETACHABLE MAST CONNECTION

Order No.	Size of Timber Inches	Live Load Tons	Proportion "A" Frame to Boom	Price
1107	10	3	1 to 2½	\$200.00
1108	12	5	1 to 2½	230.00
1109	14	7	1 to 2½	300.00
1110	16	12	1 to 2½	400.00

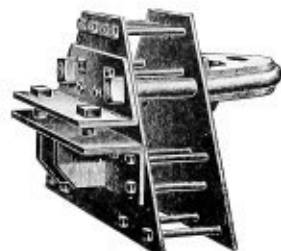


FIG. 4783

"A" FRAME HEAD WITH DETACHABLE
MAST CONNECTION

Order No.	Size of Timber Inches	Live Load Tons	Proportion "A" Frame to Boom	Price
1111	10	3	1 to 2½	\$170.00
1112	12	5	1 to 2½	200.00
1113	14	7	1 to 2½	260.00
1114	16	12	1 to 2½	350.00

OUTRIGGER JACK
SCREW

FIG. 4785

Order No. 1116

Diameter of Steel Screw 3 in.

Length of Thread.....18 in.

Length Over All.....30 in.

Capacity, Safe Load...30 tons

Price, each \$24.00



FIG. 4784

CAST STEEL
GEY CAPS

For 12 Gays or Less

Order No.	Size of Mast	Diameter of Gudgeon	Price
1118	8	2½	\$40.00
1119	10	3	40.00
1120	12	3½	56.00
1121	14	4	56.00
1122	16	4½	80.00
1123	18	5	80.00

DERRICK FITTINGS

TWO LINK GUY STRAPS



FIG. 4786



FIG. 4787

Order No.	Size of Iron	Price
1124	5x 7/8	\$10.50
1125	6x1	12.00
1126	6x1 1/4	16.00

FORGED SHACKLES

Order No.	Size of Shackle	Diameter of Pin	Size of Opening	Price Each	Price per Dozen
1127	1/2	5/8	7/8	\$0.64	\$ 7.50
1128	5/8	3/4	1 1/8	.80	9.50
1129	3/4	7/8	1 1/4	.92	11.00
1130	7/8	1	1 3/8	1.21	14.50
1131	1	1 1/8	1 3/4	1.68	20.00
1132	1 1/8	1 1/4	1 7/8	2.68	32.00
1133	1 1/4	1 3/8	2	3.34	40.00
1134	1 3/8	1 1/2	2 1/4	4.00	.32 per lb.
1135	1 1/2	1 5/8	2 1/2	5.00	.32 per lb.
1136	1 3/4	1 3/4	3	8.00	.32 per lb.
1137	2	2 1/8	3 1/2	14.00	.36 per lb.
1138	2 1/4	2 1/2	4	16.00	.36 per lb.
1139	2 1/2	2 3/4	4 1/2	28.00	.36 per lb.
1140	3	3 1/4	5	44.00	.36 per lb.

FORGED LINKS

Square	Order No.	Size of Iron Inches	Size, Inside Inches	Price		Round
				Square	Round	
	1190	7/8	2 x 7	\$2.00	\$1.50	
	1191	1	2 1/8 x 7 1/2	2.30	1.80	
	1192	1 1/8	2 1/4 x 8	3.00	2.30	
	1193	1 1/4	2 3/8 x 8 1/2	3.50	2.60	
	1194	1 3/8	2 1/2 x 9	4.50	3.50	
	1195	1 1/2	2 3/4 x 9 1/2	5.00	4.00	
	1196	1 3/4	3 x 10	7.00	5.50	
	1197	2	3 1/4 x 11	9.00	7.40	



FIG. 4790

TOP STIFF LEG STRAPS

Order No.	Size at Bend Inches	Size of Gudgeon Pin Inches	Thickness Through Eye Inches	Size of Bolts Inches	No. of Bolts	Price Each Without Bolts	Price Each With Bolts
1141	5x1 1/2	2 1/2	1 1/2	3/4	6	\$16.00	\$18.00
1142	6x2	3	2	7/8	7	25.00	28.00
1143	8x2	3 1/2	2	1	8	35.00	40.00
1144	6x3	4	2	1 1/8	10	50.00	60.00
1145	8x3	4 1/2	2	1 1/8	12	77.00	90.00
1146	10x3	5	2	1 1/4	13	100.00	120.00
1147	12x4	6	3	1 1/2	13	130.00	170.00
1148	18x4 1/2	9	3 3/4	1 1/2	15	260.00	320.00

DERRICK FITTINGS

BACK OR STIFF LEG CONNECTIONS TO SILLS

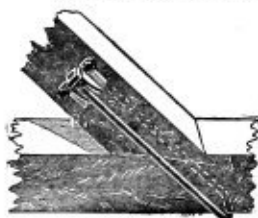


FIG. 4791

STIRRUP CONNECTION

Order No.	Size of Iron	Width of Sill Inches	Price
1154	1 1/4	6	\$ 8.00
1155	1 1/4	8	12.00
1156	1 1/2	10	20.00
1157	1 3/4	12	28.00
1158	2	14	40.00

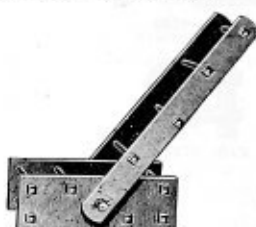


FIG. 4792

PIN CONNECTION

Order No.	Size of Timber Inches	Price
1160	8	\$22.00
1161	10	30.00
1162	12	45.00
1163	14	60.00
1164	16	90.00

BOTTOM PLATES FOR BACK LEGS



FIG. 4793

Order No.	Size of Timber Inches	Price
1167	8	\$25.00
1168	10	35.00
1169	12	50.00
1170	14	65.00
1171	16	80.00

BACK OR STIFF LEG CONNECTIONS TO SILLS



FIG. 4794

Order No.	Size of Timber Inches	Price
1177	8	\$22.00
1178	10	33.00
1179	12	50.00
1180	14	60.00
1181	16	80.00

"A" FRAME BOTTOM PLATES



FIG. 4795

Order No.	Size of Timber Inches	Price
1173	10	\$37.00
1174	12	45.00
1175	14	60.00
1176	16	75.00

BOTTOM BOOM WEARING PLATES



FIG. 4796

Order No.	Width of Boom Socket Inches	Price
1185	7 1/2	\$12.00
1186	9 1/2	13.00
1187	11 1/2	15.00
1188	13 1/2	18.00
1189	15 1/2	22.00

DERRICK FITTINGS

STEEL PIN WITH TWO COTTERS



FIG. 4797

Order No	Diameter	Length between Cotters						
		8	10	12	14	16	18	20
1198	1¼	\$0.80	.90	1.00	1.10	1.20	1.30	1.40
1199	1½	1.00	1.14	1.30	1.44	1.60	1.74	1.90
1200	1¾	1.30	1.50	1.70	1.90	2.10	2.30	2.50
1201	2	1.60	1.80	2.00	2.30	2.60	2.90	3.20
1202	2¼	2.00	2.30	2.60	2.90	3.30	3.60	4.00
1203	2½	2.40	2.80	3.20	3.60	4.00	4.40	4.80
1204	3	3.20	3.70	4.20	4.70	5.20	5.70	6.20

CENTER OILING SHEAVE PIN WITH COMPRESSION GREASE CUP

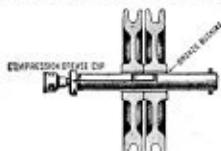


FIG. 4798

Order No.	Diameter	Length between Head and Cotter						
		8	10	12	14	16	18	20
1211	1½	\$5.50	6.50	7.50	8.50	9.50	10.50	11.50
1212	1¾	6.50	7.50	8.50	9.50	10.60	11.70	12.80
1213	2	7.60	8.80	10.00	11.20	12.40	13.60	14.80
1214	2¼	8.70	10.00	11.30	12.60	14.00	15.40	16.80
1215	2½	10.00	11.50	13.00	14.50	16.00	17.50	19.00
1216	3	13.00	15.00	17.00	19.00	21.00	23.00	25.00

Sheaves are lubricated by screwing up the grease cup cap, thus forcing the grease through the center of the pin.

MAST AND GAFF FITTING FOR SQUARE TIMBER

Can be Attached to Square Timber, Horizontal or Vertical, the Side of a Building or any Flat Surface



FIG. 4799

Order No.	Width of Bracket Inches	Size of Jib Inches	Price
1265	6	6	\$24.00
1266	9	8	32.00
1267	12	10	48.00
1268	13	12	64.00

ROPE CLEAT



FIG. 4800

Order No	Length Inches	Price
1280	8½	\$1.00
1281	15	2.00
1282	30	7.50

DERRICK FITTINGS

FOUR ROD TRUSS

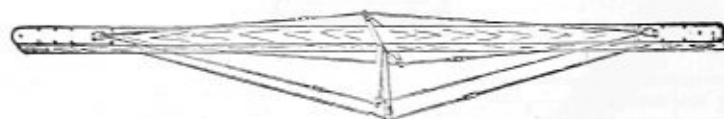


FIG. 4801

Order No.	Diam. of Rod Inches	Length of Rod Feet	Price with One Strut	Price with Two Struts
1220	$\frac{3}{4}$	35	\$121.40	\$169.40
1221	$\frac{3}{4}$	45	127.00	175.00
1222	$\frac{3}{4}$	55	133.00	182.00
1223	$\frac{7}{8}$	45	153.00	205.00
1224	$\frac{7}{8}$	55	164.00	216.00
1225	$\frac{7}{8}$	65	173.00	226.00
1226	1	45	184.50	240.50
1227	1	55	193.00	249.00
1228	1	65	202.00	258.00

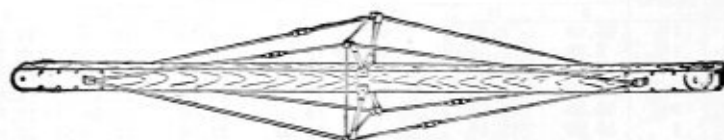


FIG. 4802

Order No.	Diam. of Rod Inches	Length of Rod Feet	Price with One Strut	Price with Two Struts
1245	$\frac{3}{4}$	35	\$100.00	\$125.60
1246	$\frac{3}{4}$	45	110.00	136.00
1247	$\frac{3}{4}$	55	116.00	144.00
1248	$\frac{7}{8}$	45	134.00	164.00
1249	$\frac{7}{8}$	55	144.00	176.00
1250	$\frac{7}{8}$	65	155.00	190.00
1251	1	45	160.00	195.60
1252	1	55	171.00	207.00
1253	1	65	182.00	219.00

Price does not include End Fittings shown in the illustration. Extra price for Connections to Boom Point and Heel Plates— $\frac{3}{4}$ -inch, \$6.50; $\frac{7}{8}$ -inch, \$7.50; 1-inch, \$9.50.

DERRICK FITTINGS DECK PLATE AND BOOM SEAT



FIG. 4803

Order No.	Size of Boom Inches	Price
1270	8	\$ 56.00
1271	10	68.00
1272	12	100.00
1273	14	160.00
1274	16	240.00

ROPE CHOCKS

Single Sheave Chock



FIG. 4804

Double Sheave Chock



FIG. 4805

Size of Sheave	Kind of Rope	Single		Double	
		Order No.	Price	Order No.	Price
6x3	Manila	1285	\$11.00	1288	\$20.00
6x1 3/4	Wire	1286	8.00	1289	15.00

Steel Frame



FIG. 4806

FAIR LEADER SHEAVES

Cast-Iron Frame



FIG. 4807

Order No.	Size of Sheave	Price	Order No.	Size of Sheave	Price
1291	8x2x1 3/4	\$ 8.00	1296	10x2x1 3/4	\$10.50
1292	10x2x1 3/4	10.50	1297	12x2x1 3/4	14.00
1293	12x2x1 3/4	14.00	1298	14x2x1 3/4	18.00
1294	14x2x1 3/4	18.00	1299	16x2x1 3/4	22.00
1295	16x2x1 3/4	22.00	....	.....	.....



FIG. 4808

STRUCTURAL BRACKETS FOR FACE OF MAST

Size of Mast Inches	Size of Sheaves	Single Line		Double Line		Triple Line	
		Order No.	Price	Order No.	Price	Order No.	Price
12	16x2x2 and 6x2x1 3/4	1300	\$36.00	1301	\$52.50	1302	\$ 69.00
14	18x2x2 1/4 and 8x2x1 1/2	1303	44.00	1304	66.00	1305	88.00
16	20x2x2 1/4 and 8x2x1 1/2	1306	50.00	1307	75.00	1308	100.00
18	22x2x2 1/2 and 10x2x1 3/4	1309	62.00	1310	93.50	1311	126.00

DERRICK FITTINGS



FIG. 4809 FIG. 4810

TAG LINE FITTINGS

Order No.	Size of Sheaves	Parts of Line on Weight	Price per Set
1312	10x1½x1¼	3	\$40.00
1313	10x1½x1¼	4	50.00



FIG. 4811 FIG. 4812



FIG. 4813

FALL LINE EVENER

Order No.	Size of Sheaves	Distance between Sheaves	Price
1314	6x2x1¼	16 inches	\$13.00



FIG. 4814

DERRICK SHEAVE BRACKETS FOR CENTER OF MAST

Size of Sheaves	Single Sheave		Double Sheave	
	Order No.	Price	Order No.	Price
10x2x1¼	1320	\$11.00	1321	\$15.50
12x2x1½	1322	12.60	1323	18.30
14x2x2	1324	16.20	1325	24.80
16x2x2	1326	17.50	1327	28.50
18x2x2¼	1328	22.50	1329	37.10
20x2x2¼	1330	24.50	1331	40.10
22x2x2½	1332	33.50	1333	51.00



FIG. 4815

FOR FACE OF MAST

Size of Sheaves	Single Sheave		Double Sheave		Triple Sheave	
	Order No.	Price	Order No.	Price	Order No.	Price
8x1½x1¼	1340	\$10.00	1341	\$14.00	....	.....
8x2 x1¼	1343	12.60	1344	16.40	....	.....
10x1½x1¼	1346	11.00	1347	15.40	....	.....
10x2 x1½	1349	13.80	1350	18.80	....	.....
12x1½x1¼	1352	12.00	1353	16.80	....	.....
12x2 x1½	1355	15.80	1356	22.40	1357	\$29.00
14x1½x1¼	1358	13.40	1359	19.80	1360	25.00
14x2 x2	1361	19.40	1362	27.80	1363	36.50
16x1½x1¼	1364	15.40	1365	22.80	1366	29.00
16x2 x2¼	1367	24.30	1368	35.00	1369	46.50
18x2 x2½	1370	32.00	1371	46.50	1372	61.50



FIG. 4816



FIG. 4817

DERRICK FITTINGS

STRAP BLOCKS



FIG. 4818



FIG. 4819

With Straight Bars

Capacity in Tons	Size of Sheaves	Single Sheave		Double Sheave		Triple Sheave	
		Order No.	Price	Order No.	Price	Order No.	Price
3	10x1 $\frac{1}{2}$ x1 $\frac{1}{4}$	1380	\$10.00	1381	\$16.00	.....	.....
3	12x1 $\frac{1}{2}$ x1 $\frac{1}{4}$	1382	11.00	1383	19.00	.....	.....
5	12x2 x1 $\frac{1}{2}$	1384	13.40	1385	22.50	.....	.....
5	14x2 x2	1386	20.00	1387	31.50	.....	.....
8	14x2 x2	1388	22.00	1389	34.00	.....	.....
8	16x2 x2 $\frac{1}{4}$	1390	25.00	1391	38.00	.....	.....
10	14x2 x2	1392	26.00	1393	38.00	.....	.....
10	16x2 x2 $\frac{1}{4}$	1394	30.00	1395	44.00	.....	.....
12	14x2 x2	1396	28.00	1397	42.00	1398	\$60.00
12	16x2 x2 $\frac{1}{4}$	1399	32.00	1400	46.00	1401	66.00
16	16x2 x2 $\frac{1}{4}$	1402	36.00	1403	50.00	1404	70.00
16	18x2 x2 $\frac{1}{2}$	1405	40.00	1406	56.00	1407	80.00

STRAP BLOCKS



FIG. 4820



FIG. 4821

With Upset Bars. One Becket for Each Pair of Blocks

Capacity in Tons	Size of Sheaves	Single Sheave		Double Sheave		Triple Sheave	
		Order No.	Price	Order No.	Price	Order No.	Price
16	16x2 x2 $\frac{1}{4}$	1439	\$46.00	1440	\$ 62.00	1441	\$ 85.00
16	18x2 x2 $\frac{1}{2}$	1442	50.00	1443	70.00	1444	96.00
20	16x2 x2 $\frac{1}{4}$	1445	55.00	1446	75.00	1447	100.00
20	18x2 x2 $\frac{1}{2}$	1448	64.00	1449	84.00	1450	112.00
25	16x2 x2 $\frac{1}{4}$	.....	.....	1451	100.00	1452	124.00
25	18x2 x2 $\frac{1}{2}$	.....	.....	1453	116.00	1454	140.00
30	16x2 x2 $\frac{1}{4}$	.....	.....	1455	120.00	1456	156.00
30	18x2 x2 $\frac{1}{2}$	.....	.....	1457	135.00	1458	162.00
35	16x2 x2 $\frac{1}{4}$	.....	.....	.....	.....	1459	190.00
35	20x2 x2 $\frac{1}{2}$	.....	.....	.....	.....	1460	216.00
40	18x2 x2 $\frac{1}{2}$	.....	.....	.....	.....	1461	252.00
40	24x2 $\frac{1}{2}$ x2 $\frac{1}{2}$	.....	.....	.....	.....	1462	300.00

STEEL GRAB HOOKS



FIG. 4822

WITH BB CHAIN

Order Number	Capacity Tons	Price, Hooks Without Chain	Price Complete
3015	5	\$18.00	\$30.00
3016	8	22.00	40.00
3017	10	28.00	52.00
3018	12	32.00	60.00

STONE TONGS

24-INCH OPENING



FIG. 4823



FIG. 4824

Order Number	Capacity Pounds	Price	Order Number	Capacity Pounds	Price
3026	1500	\$24.00	3028	4000	\$36.00
3027	2500	30.00	3029	6000	48.00

For each 1-inch opening over 24 inches, add \$2.00 to list.

LOCOMOTIVE JACK SCREWS



FIG. 4825

Capacity, Tons	Diameter of Screw	Height of Stand, Inches	Height Over All, Inches	Price, Each	Capacity, Tons	Diameter of Screw, Inches	Height of Stand, Inches	Height Over All, Inches	Price, Each
10	1 1/4	4	6 3/4	\$2.90	24	2 1/4	6	10	\$7.00
10	1 1/4	6	8 3/4	3.10	24	2 1/4	8	12	7.50
10	1 1/4	8	10 3/4	3.40	24	2 1/4	10	14	8.25
10	1 1/4	10	12 3/4	3.80	24	2 1/4	12	16	9.00
10	1 1/4	12	14 3/4	4.20	24	2 1/4	14	18	10.00
10	1 1/4	14	16 3/4	4.60	24	2 1/4	16	20	11.00
12	1 1/2	4	7	3.25	24	2 1/4	18	22	12.00
12	1 1/2	6	9	3.75	24	2 1/4	20	24	13.25
12	1 1/2	8	11	4.25	24	2 1/4	22	26	14.50
12	1 1/2	10	13	4.75	24	2 1/4	24	28	15.75
12	1 1/2	12	15	5.25	28	2 1/2	6	10 1/2	7.75
12	1 1/2	14	17	6.00	28	2 1/2	8	12 1/2	8.75
12	1 1/2	16	19	6.75	28	2 1/2	10	14 1/2	9.75
16	1 3/4	5	8 1/2	4.25	28	2 1/2	12	16 1/2	10.75
16	1 3/4	6	9 1/2	4.50	28	2 1/2	14	18 1/2	12.00
16	1 3/4	8	11 1/2	5.00	28	2 1/2	16	20 1/2	13.25
16	1 3/4	10	13 1/2	5.75	28	2 1/2	18	22 1/2	14.50
16	1 3/4	12	15 1/2	6.25	28	2 1/2	20	24 1/2	15.75
16	1 3/4	14	17 1/2	6.75	28	2 1/2	22	26 1/2	17.00
16	1 3/4	16	19 1/2	7.50	28	2 1/2	24	28 1/2	18.25
16	1 3/4	18	21 1/2	8.50	28	2 1/2	28	32 1/2	22.00
20	2	5	9	5.00	28	2 1/2	32	36 1/2	26.00
20	2	6	10	5.25	36	3	14	18 1/2	19.50
20	2	8	12	6.00	36	3	16	20 1/2	20.75
20	2	10	14	6.75	36	3	18	22 1/2	22.00
20	2	12	16	7.50	36	3	20	24 1/2	23.25
20	2	14	18	8.25	36	3	22	26 1/2	24.50
20	2	16	20	9.25	36	3	24	28 1/2	25.75
20	2	18	22	10.25	36	3	30	34 1/2	30.00
20	2	20	24	11.50	.....	.....	.....	.....	.....
20	2	22	26	12.50	.....	.....	.....	.....	.....
20	2	24	28	13.50	.....	.....	.....	.....	.....

Levers will be sent only when ordered, and will be charged for extra. Car Box Jack Screws, furnished in sizes listed above, at 50 cents advance on list.

BELL BOTTOM JACK SCREWS



FIG. 4826

Capacity	Plain, Tons	Ratchet, Tons
1 1/4-inch diameter screw.....	10	12
1 1/2 " " " ".....	12	16
1 3/4 " " " ".....	16	20
2 " " " ".....	20	24
2 1/4 " " " ".....	24	28
2 1/2 " " " ".....	28	32
3 " " " ".....	36	40

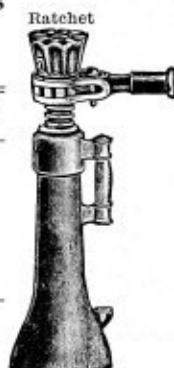


FIG. 4827

Diam. of Screw, Inches	Height of Stand, Inches	Plain		Ratchet		Diam. of Screw, Inches	Height of Stand, Inches	Plain		Ratchet	
		Height Over All, Inches	Price, Each	Height Over All, Inches	Price, Each			Height Over All, Inches	Price, Each	Height Over All, Inches	Price, Each
1 1/4	4	6 3/4	\$2.90	7 1/4	\$9.80	2 1/4	6	10	\$7.00	12	\$18.00
1 1/4	6	8 3/4	3.10	9 1/4	10.10	2 1/4	8	12	7.50	14	19.00
1 1/4	8	10 3/4	3.40	11 1/4	10.40	2 1/4	10	14	8.25	16	20.00
1 1/4	10	12 3/4	3.80	13 1/4	10.80	2 1/4	12	16	9.00	18	21.00
1 1/4	12	14 3/4	4.20	15 1/4	11.20	2 1/4	14	18	10.00	20	22.00
1 1/4	14	16 3/4	4.60	17 1/4	11.60	2 1/4	16	20	11.00	22	23.00
1 1/2	4	7	3.25	7 3/4	11.25	2 1/4	18	22	12.00	24	24.00
1 1/2	6	9	3.75	9 3/4	11.75	2 1/4	20	24	13.25	26	25.00
1 1/2	8	11	4.25	11 3/4	12.25	2 1/4	22	26	14.50	28	26.00
1 1/2	10	13	4.75	13 3/4	12.75	2 1/4	24	28	15.75	30	27.00
1 1/2	12	15	5.25	15 3/4	13.25	2 1/2	6	10 1/2	7.75	12	19.50
1 1/2	14	17	6.00	17 1/2	14.00	2 1/2	8	12 1/2	8.75	14	20.50
1 1/2	16	19	6.75	19 1/2	14.75	2 1/2	10	14 1/2	9.75	16	21.50
1 3/4	5	8	4.25	9	13.25	2 1/2	12	16 1/2	10.75	18	22.50
1 3/4	6	9 1/2	4.50	10	13.50	2 1/2	14	18 1/2	12.00	20	23.50
1 3/4	8	11 1/2	5.00	12	14.00	2 1/2	16	20 1/2	13.25	22	24.50
1 3/4	10	13 1/2	5.75	14	14.75	2 1/2	18	22 1/2	14.50	24	25.50
1 3/4	12	15 1/2	6.25	16	15.25	2 1/2	20	24 1/2	15.75	26	26.50
1 3/4	14	17 1/2	6.75	18	15.75	2 1/2	22	26 1/2	17.00	28	27.75
1 3/4	16	19 1/2	7.50	20	16.50	2 1/2	24	28 1/2	18.25	30	29.00
1 3/4	18	21 1/2	8.50	22	17.50	2 1/2	28	.....	.....	34	33.00
2	5	9	5.00	9	14.50	2 1/2	32	.....	.....	38	37.00
2	6	10	5.25	10	15.25	3	14	18 3/4	19.50	20	32.00
2	8	12	6.00	12	16.00	3	16	20 3/4	20.75	22	33.50
2	10	14	6.75	14	16.75	3	18	22 3/4	22.00	24	35.00
2	12	16	7.50	16	17.50	3	20	24 3/4	23.25	26	37.00
2	14	18	8.25	18	18.25	3	22	26 3/4	24.50	28	38.50
2	16	20	9.25	20	19.00	3	24	28 3/4	25.75	30	40.00
2	18	22	10.25	22	19.75	3	30	34 1/2	30.00	36	48.00
2	20	24	11.50	24	20.50	.....	.....	.....	.....	.....	.....
2	22	26	12.50	26	21.50	.....	.....	.....	.....	.....	.....
2	24	28	13.50	28	22.50	.....	.....	.....	.....	.....	.....

Levers will be sent only when ordered and will be charged for extra.

DUFF (GENUINE BARRETT) TRACK JACKS

Nos. 223 & 226
Single Acting

FIG. 4828

No. 1
Double Acting

FIG. 4829

No. 17
Single Acting

FIG. 4830

No. 7
Single Acting

FIG. 4831

No. 101
Double Acting

FIG. 4832

No. 6
Double Acting

FIG. 4833

Jack No.	Capacity Tons	Height Inches	Raise Inches	Wt. with Lever	List Price
226	2½	18½	10¼	31	\$18.00
223	4	22	13	44	25.00
1	10	24	13½	65	22.00
17	10	24	13	65	22.00
7	15	24	13¾	87	32.00
101	10	24	13½	65	25.00
6	15	31	19	110	32.00
12	10	17¾	8	57	17.00
11	10	17¾	8	58	22.00

These Trip or Track Jacks are made of the finest materials obtainable. Each Jack is provided with an attachment for instantaneous tripping. Nos. 223 and 226 are for light work. No. 1 is the recognized standard used by nearly all railroads, and fills the requirements of the Roadmasters' Association of America. No. 17 is similar to No. 1 but is single acting instead of double acting. No. 7 is identical with No. 17 but is built for much heavier work and has a capacity of 15 tons. No. 6 is made along the lines of the No. 1 Jack but is much heavier, has a capacity of 15 tons and is provided with two carrying handles. This model is especially designed for the use of ballast gangs. No. 101 is a new and special design with improvements over the Standard No. 1 Jack and is being adopted by many railroads for use in place of the No. 1 Jack. The working parts of all Duff Track Jacks are accurately machine finished and when worn out can easily be taken out and replaced at slight cost. The fact that over one million Duff Genuine Barrett Jacks have been placed with the steam and street railways is substantial evidence of their worth.

DUFF (GENUINE BARRETT) AUTOMATIC LOWERING JACKS

Nos. 50 & 51
Double Acting



FIG. 4834
Nos. 219 & 339
Single Acting

Nos. 2 & 3
Double Acting



FIG. 4835

No. 18
Single Acting



FIG. 4836

Nos. 4 & 5
Double Acting



FIG. 4837

Nos. 19, 39, 49
Single Acting



FIG. 4838



FIG. 4839



FIG. 4840

The term "Automatic Lowering" is applied to the Duff Genuine Barrett Jacks to distinguish them from our trip jacks which drop the load instantly. Automatic Lowering Jacks are ratcheted up or down notch by notch, the direction being determined by a half turn of the small eccentric at the side of the frame. These Jacks are made of the very best materials obtainable. No. 2 is widely used for all general purposes and is of the double acting type. No. 219 is used by many railroads as a car jack and is well known to railroad men. No. 239 is a Jack that, although designed especially as an emergency car jack for the use of electric railways, has found many uses in every line of industry.

No. Jack	Capacity Tons	Height Inches	Raise Inches	Weight with Lever	List Price	No. Jack	Capacity Tons	Height Inches	Raise Inches	Weight with Lever	List Price
50	5	16	8	35	\$16.00	219	15	28	17½	91	\$40.00
51	5	21	13	42	18.00	339	15	22	11½	95	40.00
2	10	21	10	73	25.00	239	15	22	10½	97	55.00
3	12	26½	15	95	30.00	19	15	28	17½	117	35.00
18	10	21	10	75	25.00	39	15	22	11½	106	35.00
4	15	22	10	106	35.00	49	15	35	24½	122	45.00
5	15	28	15	124	40.00	...	...	...	...	...	.....

TRAVERSING BASE FOR USE WITH DUFF JACKS

Sometimes it is desirable to move a load horizontally as well as vertically. The traversing base illustrated here is designed especially for that purpose and is recommended for use with any Duff automatic lowering jack, ball bearing screw jack or hydraulic jack. Such a base finds many uses—it can be employed to advantage as a car replacer. In selecting a traversing base for any jack, the price for the combination is equal to the price quoted on the jack plus the price of the traversing base as below.

Base No	Capacity Tons	Horizontal Travel Inches	Height Inches	Size of Plate Inches	Wt.	List Price
40	25	15	4	10x12	90 lbs.	\$40.00

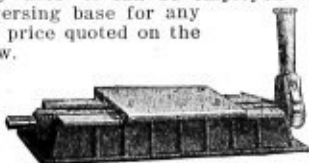


FIG. 4841

DUFF GEARED AUTOMATIC LOWERING JACK NO. 230



FIG. 4842

Constructed of steel throughout, this jack represents the latest and most advanced design in geared jacks; embodies simplified reversing mechanism and mechanically locked pawls which cannot pull away or slip under load. All gears are machine cut from steel forgings, all wearing surfaces are heat treated. The steel socket lever is an original one piece design. Hardened steel rollers in the rack channel reduce friction to a minimum. Due to superior materials and design, this Jack is very light, efficient, strong, and safe, with an upkeep expense that is negligible.

No	Capacity in Tons	Height Inches	Raise Inches	Size of Bar Inches	Weight with Lever Pounds	List Price
230	35	28	17	2½x3	220	\$130.00

DUFF GEARED AUTOMATIC LOWERING JACK NO. 29

This jack is convenient for the rapid handling of heavy loads of almost any character. It is single acting, raising the load on the downward stroke of the lever only. Has a forged steel foot lift. There are no intricate parts or complicated features, and due to the machine cut reducing gears, operation is made easy. The base is made of refined malleable iron, the lifting rack of forged steel with machine cut teeth.

Jack No.	Capacity in Tons	Height Bar Down Inches	Raise of Bar Inches	Size of Bar Inches	Weight with Lever	List Price
29	25	28	17	2½x2¼	190 lbs.	\$95.00



FIG. 4843

JOYCE-CRIDLAND LEVER JACKS

Plain Lever
Nos. 1-A to 10-A

FIG. 4844

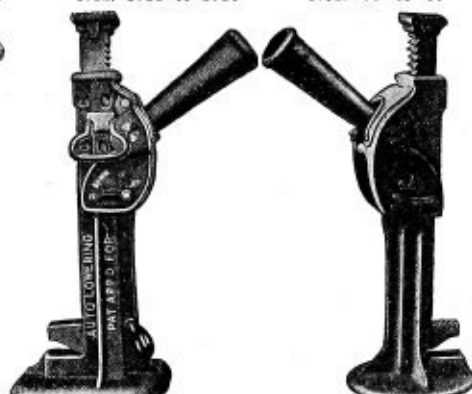
Full Automatic Lever
Nos. 1922 to 1928 Nos. 66 to 85

FIG. 4845

Track
Nos. 92 to 94

FIG. 4847

PLAIN LEVER JACKS

Jack No.	Height when Down Inches	Rise of Bar Inches	Size of Bar Inches (Square)	Weight of Jack Pounds	Capacity Tons	List Price
1a	16	8 1/4	1 1/4	24	2	\$14.00
2a	18 1/2	10	1 1/4	28	2	14.00
2b	18 1/2	10	1 1/4	25	2	14.00
4	22 1/2	14	1 1/2	40	4	23.00
4a	18 1/2	10 1/2	1 1/2	37	4	23.00
6	26 1/2	14	2	92	15	35.00
10	27	16	1 3/4	76	10	32.00
10a	22 1/2	11 1/2	1 3/4	63	10	32.00

FULL AUTOMATIC LEVER JACKS

Jack No.	Height when Down Inches	Rise of Bar Inches	Size of Bar Inches (Square)	Weight of Jack, Pounds	Capacity Tons	List Price
66	13 1/2	6 1/2	1 1/4	33	5	\$14.00
67	16	8	1 1/4	34	5	16.00
68	19	11	1 1/4	39	5	18.00
76	22 1/4	14 1/4	1 1/2	54	10	24.00
81	27	15	1 3/4	88	12	32.00
84	22	12	2	90	15	32.00
85	26 1/2	16	2	105	15	35.00
1922	22	11	2	92	15	35.00
1928	28	17	2	110	15	35.00

TRACK JACKS

	No. 92	No. 94
Height when down.....inches	22 1/2	27
Rise of bar.....inches	14	16
Size of bar.....inches, square	1 1/2	1 3/4
Weight of Jack.....pounds	42	80
Capacity.....tons	10	15
Price.....	\$22.00	32.00

SIMPLEX JACKS

No. 51—Industrial



FIG. 4848

No. 55—Industrial



FIG. 4849

No. 2—Bridge and Car



FIG. 4850

SIMPLEX INDUSTRIAL, BRIDGE AND CAR JACKS

Especially designed for bridge, track crossing, heavy construction and industrial work. They are powerful, rapid, highly efficient and built for rough, abusive service. Made of drop forged steel and heavy malleable castings. Simplex mechanism locks working parts so that load can never drop.

No.	50	51	55	2	4	19	25	35	40
Cap. tons	5	5	10	10	15	15	25	35	40
Lift, in.	8½	13½	13½	12	11½	17½	16½	16½	26½
Height, in.	15½	20	17	20½	22½	28	27	26½	37
Weight, lbs.	34	38	49	56	91	100	150	200	260
Price	\$20.00	\$22.00	\$31.00	\$25.00	\$35.00	\$35.00	\$100.00	\$135.00	\$175.00

No. 1—Track



FIG. 4851

No. 117—Track



FIG. 4852

No. 25—Car



FIG. 4853

SIMPLEX TRACK JACKS

Built for "above the average" duty on track, ballast or construction work. Have less working parts, are made of strongest materials and embody the latest design in track jack construction. Simplex Track Jacks have been standardized by leading railroads.

No.	1	6	116	117	118
Cap. tons	10	15	10	10	15
Lift, in.	13½	18½	8	12½	18½
Height, in.	25	31	15½	20½	28
Weight, lbs.	65	98	46	53	70
Price	\$22.00	\$32.00	\$20.00	\$22.00	\$32.00

JOYCE-CRIDLAND FULL AUTOMATIC GEARED JACKS

No. 400

No. 295



FIG. 4854



FIG. 4855

The aim in designing this Jack has been to produce a substantial and reliable device of great power and few working parts to handle the heaviest loads.

The Full Automatic Geared Jack has all the advantages afforded by a fine-toothed rack, with none of its weaknesses.

The rise of the bar per lever stroke is $\frac{1}{8}$ inch, yet the pitch of the bar teeth is $1\frac{1}{2}$ inch. The material used in all the working parts is chrome nickel steel, heat treated.

No. 32-A



FIG. 4856

Jack No.	Height when Down Inches	Rise of Bar Inches	Rise per Stroke of Lever Inches	Size of Bar Inches	Weight of Jack Pounds	Capacity Tons	Price
290	27 $\frac{1}{2}$	17	$\frac{1}{8}$	2 $\frac{1}{2}$ x 2 $\frac{1}{4}$	165	25	\$90.00
293a	24	14	$\frac{1}{8}$	2 $\frac{1}{2}$ x 3	175	35	110.00
295a	27	17	$\frac{1}{8}$	2 $\frac{1}{2}$ x 3	190	35	110.00
296a	33	23	$\frac{1}{8}$	2 $\frac{1}{2}$ x 3	215	35	115.00
297a	36	26	$\frac{1}{8}$	2 $\frac{1}{2}$ x 3	230	35	115.00
397	22	12	$\frac{3}{8}$	3 x 3	250	50	125.00
400	27 $\frac{1}{4}$	17	$\frac{1}{8}$	3 x 3	268	50	125.00
401	36	26	$\frac{1}{8}$	3 x 3	300	50	135.00
402	31	21	$\frac{1}{8}$	3 x 3	282	50	135.00

MINING JACK

This Jack is constructed especially for use in raising the roof timbers in the tunnels and entries of mines.

Two Jacks are used together, one being placed under where each end of the timber is to be. The timber is placed on top of the Jacks, and the Jacks run up until the timber is in position. Then the legs are placed and the Jacks removed ready for the next timber.

Height when down.....	inches	44
Rise of bar.....	inches	30
Size of bar.....	inches, square	1 $\frac{1}{2}$
Weight of jack.....	pounds	70
Capacity.....	tons	4
Price.....		\$30.00
Extra run.....	per inch	.75



FIG. 4857

DUFF MOTOR ARMATURE LIFTS

For use in removing armatures from the motor frame. Consists of a steel frame, with flat or flanged wheels as desired, arranged for a track of 24 inch gage, mounted on a sliding base which has a side adjustment of six inches and has a large hand wheel which revolves in ball bearings and raises or lowers the screw. When ordering always send sketch showing depth of pit and diameter of armature. Arranged for a pit of about four feet deep, the dimensions are:

Width Inches	Length Inches	Gage Inches	Height Screw Down, In.	Raise of Screw Inches	Side Adjust- ment Inches	List Price
29	33	24	36	26	6	\$75.00

DUFF GENUINE BARRETT CABLE REEL JACK

A pair of these Jacks will safely handle cable reels of almost any size, the capacity of each Jack being about 6 tons on the top hook. A cable reel weighing more than this may be lifted on the swivel top which will safely take care of loads up to 10 tons. These Jacks are bolted to an oak base. Used by the Telephone and Telegraph Company of New York. The height given below indicates the lowest position to which Jacks may be lowered.

No.	Height to Top	Height to Top Hook	Height to Second Hook	Height to Lower Hook	Raise Inches	List Price
2 C.R.	35 3/4 in.	31 3/4 in.	24 3/4 in.	15 3/8 in.	10	\$50.00



FIG. 4858

DUFF GENUINE BARRETT PIPE FORCING JACK NO. 125

Designed for forcing pipe horizontally through the ground. Used for forcing pipe under lawns, sidewalks, street crossings and railway tracks, thereby saving large expense and inconvenience digging trenches and replacing. Will force pipe

of 3/4 to 4 inches diameter through 60 to 300 feet. In successful use by hundreds of gas and water companies, plumbers, etc. This Jack will force pipe through all reasonable earth, pushing aside all sticks or roots encountered.

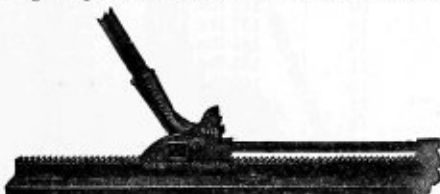


FIG. 4859

Capa- city Tons	Total Length Feet	Travel of Cage Feet	Weight Pounds	List Price
15	8 1/2	7 1/2	185	\$75.00

DUFF BALL BEARING SCREW JACKS

No. 64

Nos. 66 to 62

Nos. 71 to 93

No. 70



FIG. 4860



FIG. 4861



FIG. 4862

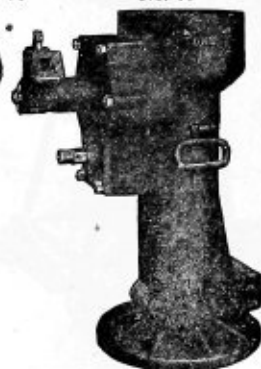


FIG. 4863

Made entirely of refined malleable iron and steel. All gears made from special analysis high carbon steel, drop forged, and have machine-cut teeth.

The load is raised by means of a crucible machinery steel screw with a special thread, which revolves in a bronze nut made to our own special alloy specifications of exceedingly great hardness and strength. The load is carried on a large ball bearing which gives the minimum amount of friction with the maximum strength. The thrust on the bevel pinion is taken by another anti-friction bearing, a feature found only in Duff Ball Bearing Screw Jacks.

WITH FOOT LIFT

Jack No.	Capacity in Tons	Height in Inches	Raise in Inches	Size of Base in Inches	Diam. of Head in Inches	Weight with Lever	List Price
66	15	22	10	5x 9	5	120 lbs.	\$60.00
60	15	26	13	5x 9	5	132 lbs.	70.00
67	25	22	10	8x11	6	167 lbs.	90.00
61	25	27	13	8x11	6	196 lbs.	96.00
68	35	22	10	9x10½	6¾	220 lbs.	130.00
62	35	26	13	9x10½	6¾	250 lbs.	138.00
64	56	27	13	*14	10½	320 lbs.	150.00
70	70	27	13	*14	10½	370 lbs.	200.00

WITHOUT FOOT LIFT

Jack No.	Capacity Tons	Height in Inches	Raise in Inches	Diam. of Base in Inches	Weight with Lever	List Price
71	15	18	7	10	99 lbs.	\$ 60.00
72	15	20	9	10	104 lbs.	60.00
73	15	22	10	10	107 lbs.	60.00
74	15	26	13	10	115 lbs.	70.00
75	15	32	19	10	137 lbs.	75.00
81	25	20	9	10	141 lbs.	80.00
82	25	24	11	11	159 lbs.	85.00
83	25	26	13	12	180 lbs.	90.00
84	25	30	17	12	200 lbs.	95.00
63	25	36	23	12	230 lbs.	100.00
91	35	26	13	12	205 lbs.	125.00
92	35	31	18	12	220 lbs.	135.00
93	35	36	23	12	240 lbs.	145.00

*Diameter of Base.

DUFF IMPROVED BALL BEARING JOURNAL JACKS

Designed especially for use in connection with the inspection, removing or replacing of journal brasses in locomotives, freight, passenger and Pullman cars. The steel screw is designed with a high pitch which gives speed and ease in operation. This screw revolves within a bronze nut—this combination of hard bronze and steel assure great strength and long wearing qualities. Each of the large alloy steel balls in the bearing test up to a crushing strain equal to the maximum rated capacity of the jack. All gears are of steel and cut from a solid bar with machine cut teeth, case hardened and heat treated.

**FIG. 4864**

Jack No.	Capacity Tons	Height Inches	Raise Inches	Weight with Lever	List Price
159	25	9	3 1/4	50 lbs.	\$35.00
259	25	11	5 1/4	55 lbs.	35.00

DUFF IMPROVED BALL BEARING JOURNAL JACKS

These are the only 15-ton Ball Bearing Journal Jacks made having ball bearings and other special features. Unusually easy operation is secured by using ball bearings to carry the weight of the load, and by accurately machine finishing every moving part, thus eliminating all lost motion and reducing friction to a minimum. The inside is packed with semi-fluid grease in which all moving parts revolve. This grease is not affected by heat or cold and cannot leak out. Especially designed for use in inspecting, removing and replacing journal brasses in lightly loaded or empty freight cars, passenger and Pullman cars, and without a doubt are the most easily operated and fastest journal jacks ever designed.

**FIG. 4865**

Jack No.	Capacity Tons	Height Closed Inches	Raise in Inches	Weight Pounds	List Price
53	15	9 3/4	4	27	\$22.00
52	15	11	5	28	22.00

DUFF SCREW JACK ON TRAVERSING BASE**FIG. 4866**

Designed especially for locomotives for use in derailments. It lifts a load vertically and carries it horizontally. The traversing base and the base and head of the jack are of malleable iron, the lifting screw is of open hearth machinery steel. The nut within which this screw revolves is made of bronze. This combination results in a very small amount of friction and insures long wear. The ratchet lever may be used at either end of the traversing base. The traversing base screw turns in a bronze nut and bronze bushings. This jack has a raise of 10 1/2 inches and a horizontal travel of 12 inches.

No.	Capacity Tons	Height Inches	Raise Inches	Horizontal Travel Inches	Weight Pounds	List Price
S-825	35	24	10 1/2	12	145	on ap.

Nos. 37 and 60



FIG. 4867

Nos. 37 and 60

Traversing Base with Telescoping
Jack and Ratchet Head.

Nos. 37A and 60A

Traversing Base with Telescoping
Jack and Six-Way Head.

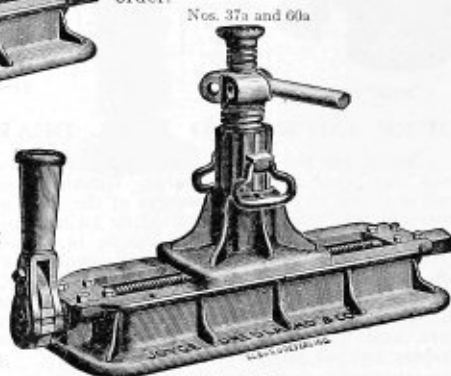


FIG. 4868

JOYCE-CRIDLAND TRAVERSING JACKS

We furnish any Joyce-Cridland Jacks with suitable ratchet operated, traversing bases, or we can furnish separately a base having a large sliding plate or rest on which any jack can readily be used. The horizontal movement of the standard base is 15 inches, but any other amount of movement is made to order.

Nos. 37a and 60a

Jack No.	Height when Down, Inches	Height of Base, Inches	Rise of Screw, Inches	Horizontal Movement Inches	Weight of Jack, Pounds	Capacity Tons	SIX-WAY HEAD	RATCHET HEAD
							Price	Price
37	15	3 1/2	10	15	137	8	.....	\$100.00
37a	15	3 1/2	10	15	115	8	\$85.00	.....
60	18	3 1/2	14	15	149	15	.....	115.00
60a	18	3 1/2	14	15	135	15	95.00	.....

TRAVERSING BASES

	No. 40	No. 43
Height to Top of Plate, Inches	4 1/4	5 3/8
Horizontal Movement, Inches	15	15
Size of Plate, Inches....	10x12	13x13
Weight, Pounds.....	90	180
Capacity, Tons.....	25	50
Price.....	\$60.00	\$90.00

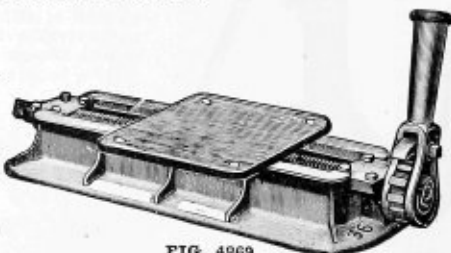


FIG. 4869

DUFF HIGH SPEED BALL BEARING SCREW JACKS

For rapid, convenient and economical handling of Railway Equipment and for all general lifting purposes, these are the fastest and easiest operating High Speed Jacks ever designed, at the same time affording absolute safety in operation. They raise the load upward by means of a raising lever and lower very rapidly by cranking with the lowering handle. Regardless of the speed with which the load may be descending, it may be stopped instantly to within a thousandth part of an inch of any point desired—an automatic positive safety clutch (patented), holds the load firmly at all times. The lowering handle is also used for fast raising up to the load. Note the large clearance and wide swing of this handle. Furnished with plain base instead of wheel base if desired.

Jack No.	Capacity in Tons	Height, Inches	Raise Inches	Weight, Pounds	List Price
1675	75	26	12	260	\$280.00
1674	75	24	10	245	280.00
1672	75	20	6	315	280.00

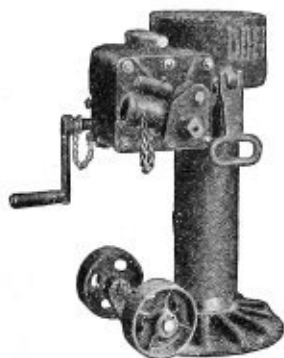


FIG. 4870

DUFF HIGH SPEED BALL BEARING SCREW JACKS

These Jacks are constructed along exactly the same lines as those described above, the only difference being that the ones above have a capacity of 75 tons, while these jacks are made in capacities of 35 and 50 tons. Designed with the same automatic positive safety clutch (patented) which holds the load firmly at all times making dropping or sinking an impossibility.



FIG. 4871

Jack No.	Capacity in Tons	Height, Inches	Raise Inches	Weight, Pounds	List Price
1574	50	26	24	270	\$220.00
1576	50	23	14	235	180.00
1573	50	24	12	228	180.00
1592	35	30	17	175	160.00
1591	35	26	13	163	150.00

DUFF HIGH SPEED BALL BEARING SCREW JACKS

These Jacks have a toe lift cast integral with the shell, for lifting low set loads. Otherwise they are identical with the jacks shown above. All Duff High Speed Ball Bearing Screw Jacks are alike in construction and operation. They are all lowered by cranking with a lowering handle—a few turns are all that are necessary. This operation is so simple and easy that a small boy can do it with little effort. The positive clutch used in these Jacks makes sinking or dropping under the load an impossibility.

Jack No.	Capacity in Tons	Height, Inches	Raise Inches	Weight, Pounds	List Price
1664	75	26	13	350	\$325.00
1564	50	26	14	295	200.00



FIG. 4872

DUFF-BETHLEHEM FORGED STEEL HYDRAULIC JACKS



These jacks entirely overcome the imperfections and inconveniences common to the ordinary pattern hydraulic jacks. Packing, usually the most troublesome feature of hydraulic jacks, is reduced to a minimum, two packings being dispensed with altogether.

Duff Bethlehem Hydraulic Jacks are from 30 to 60 per cent lighter in weight than any other make of hydraulic jack of similar stroke and lifting capacity. Note the symmetrical shape of these jacks, no projections to break or prohibit operation in small places.

The cylinder and ram are constructed of open hearth fluid compressed steel, giving great strength and light weight. The inside parts are forgings, other parts are bronze. The employment of a very small number of parts in the operating mechanism makes for durability. Any part may be easily replaced if necessary without special tools.

These jacks are operated to their full extension in either a vertical, inclined or horizontal position due to the special construction and location of the valves.

Capacity Tons	Height Inches	Raise Inches	Weight Lbs.	"Plain" Base	"Broad" Base
20	23 $\frac{1}{4}$	12	94 114	\$100.00	\$120.00
20	29 $\frac{1}{4}$	18	106 126	118.00	140.00
30	24 $\frac{1}{4}$	12	110 135	140.00	150.00
30	30 $\frac{1}{4}$	18	125 150	165.00	175.00
40	24 $\frac{3}{8}$	12	116 141	155.00	180.00
40	30 $\frac{3}{8}$	18	135 160	185.00	220.00
50	26 $\frac{1}{2}$	12	160 190	180.00	210.00
50	33 $\frac{3}{8}$	18	187 212	215.00	266.00

Capacity Tons	Height Inches	Raise Inches	Weight Lbs.	"Fixed" Claw	"Wrecking" with Claw
20	23	12	160	\$165.00	\$140.00
20	29	18	180	185.00	162.00
30	24	12	210-220	210.00	195.00
30	30	18	240	245.00	225.00
40	24 $\frac{1}{4}$	12	220	250.00	235.00
40	30 $\frac{1}{4}$	18	250	280.00	280.00
50	26 $\frac{1}{2}$	12	270-290	280.00	315.00
50	33 $\frac{3}{8}$	18	300-330	340.00	375.00

JOYCE-CRIDLAND HYDRAULIC JACKS

Single



FIG. 4878

OUTSIDE PUMP TYPE

The valve mechanism and working parts of these jacks operate similarly to those of the inside pump type, but the pump is aside of the cylinder instead of in the end of the ram. The filling liquid is retained in the reservoir which surrounds the lower end of the cylinder. The screen which filters the filling liquid is placed on the reservoir end of pipe which conducts the liquid into the pump.

The heavier models, as shown at the right, are equipped with double pumps, which, when both are used, enable these jacks to be operated at twice the speed of a single pump.

Double

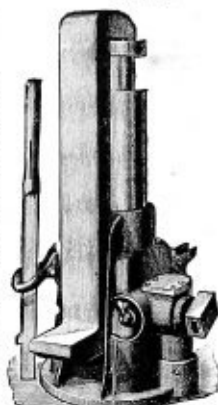


FIG. 4879

Outside Pump, Light Duty

Capacity Tons	Rise Inches	Height when Down, Inches	Weight Pounds	Price Single Pump
4	6	11	35	\$ 64.00
4	12	17	78	68.00
7	6	11	74	66.00
7	9	14 $\frac{1}{4}$	81	70.00
7	12	17 $\frac{1}{4}$	82	74.00
10	6	11	75	70.00
10	9	15 $\frac{1}{8}$	86	76.00
10	12	18 $\frac{1}{8}$	95	80.00
10	18	24 $\frac{1}{8}$	113	90.00
15	6	11 $\frac{1}{2}$	94	80.00
15	9	15 $\frac{1}{8}$	106	91.00
15	12	18 $\frac{3}{8}$	120	100.00
15	18	24 $\frac{3}{8}$	142	118.00
20	6	12 $\frac{1}{2}$	97	104.00
20	9	15 $\frac{3}{8}$	118	114.00
20	12	18 $\frac{3}{8}$	133	124.00
20	18	24 $\frac{3}{8}$	165	148.00
.....				
.....				
.....				

Outside Pump, Heavy Duty

Capacity Tons	Rise Inches	Height when Down, Inches	Weight Pounds	Price Triple Pump
30	9	16 $\frac{3}{4}$	204	\$185.00
30	12	20 $\frac{1}{4}$	241	200.00
30	18	25 $\frac{3}{4}$	259	240.00
40	9	17 $\frac{1}{2}$	222	210.00
40	12	20 $\frac{3}{8}$	244	234.00
40	18	26 $\frac{3}{8}$	288	274.00
50	9	18 $\frac{1}{2}$	255	.....
50	12	20 $\frac{1}{4}$	295	.....
50	18	26 $\frac{3}{4}$	330	.....
60	9	18 $\frac{1}{8}$	268	250.00
60	12	20 $\frac{1}{4}$	313	270.00
60	18	26 $\frac{3}{4}$	353	302.00
80	9	18 $\frac{1}{2}$	357	294.00
80	12	21	394	314.00
80	18	27 $\frac{1}{4}$	460	350.00
100	9	19 $\frac{1}{4}$	450	330.00
100	12	22 $\frac{1}{4}$	495	364.00
100	18	29 $\frac{1}{4}$	596	410.00
150	9	20	500	500.00
150	12	23	550	535.00
150	18	30 $\frac{5}{8}$	750	580.00
200	12	25	750	625.00
.....				
.....				
.....				

HENDERER'S HYDRAULIC JACKS

Plain



FIG. 4880

Broad Base



FIG. 4881

Claw



FIG. 4882

Low or Horizontal

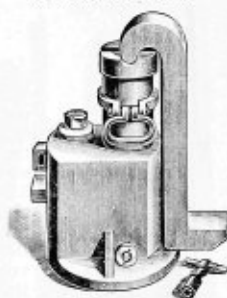


FIG. 4883

Capacity, Tons	Rise, Inches	Plain	Broad Base	Claw
4	12	\$ 50.00	\$ 56.00	\$58.00
5	4	42.00	.....	.....
7	12	54.00	64.00	68.00
7	18	60.00	68.00	70.00
7	24	64.00	70.00	.....
10	12	60.00	70.00	76.00
10	18	70.00	82.00	86.00
10	24	78.00	94.00	.....
15	12	76.00	92.00	94.00
15	18	86.00	108.00	112.00
15	24	100.00	124.00	.....
20	12	90.00	110.00	118.00
20	18	108.00	130.00	140.00
20	24	130.00	156.00	.....
30	9	110.00	124.00	.....
30	12	128.00	138.00	158.00
30	18	152.00	160.00	190.00
40	12	144.00	166.00	184.00
40	18	170.00	206.00	.....
50	12	168.00	190.00	.....
50	18	.....	230.00	.....
60	12	.....	240.00	.....

LOW OR HORIZONTAL HYDRAULIC JACK

Capacity Tons	Rise Inches	Price	Extra for Claw	Capacity Tons	Rise Inches	Price	Extra for Claw
7	12	\$ 64.00	\$ 8.00	30	12	\$150.00	\$16.00
7	18	72.00	10.00	30	18	174.00	21.00
10	12	72.00	8.00	40	12	162.00	20.00
10	18	82.00	10.00	40	18	188.00	25.00
10	24	94.00	12.00	50	12	182.00	24.00
15	12	92.00	10.00	50	18	206.00	29.00
15	18	108.00	12.00	60	12	206.00	28.00
15	24	124.00	14.00	60	18	232.00	33.00
20	12	116.00	12.00	80	12	236.00	34.00
20	18	134.00	15.00	100	12	272.00	40.00
20	24	156.00	18.00	...	..	.....	.....

DUDGEON'S IMPROVED HYDRAULIC JACK PLAIN JACK

For use in presses, or where there is a firm foundation or support.

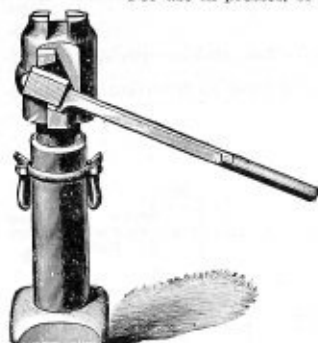


FIG. 4884

Tons, Lift	Run Out	Height, Inches	Size of Bottom, Inches	Weight, lbs.	Price, Each
4	12	24	4 sq.	46	\$60.00
7	12	25	4 1/4 "	64	70.00
7	18	32	4 1/2 "	72	73.00
10	12	25	6 "	80	80.00
10	18	32	6 "	98	95.00
10	24	39	6 "	110	110.00
15	12	26	6 1/2 "	102	100.00
15	18	32	6 1/2 "	120	125.00
15	24	39	6 1/2 "	140	150.00
20	12	26	7 "	127	120.00
20	18	33	7 "	155	145.00
20	24	39	7 "	180	170.00
30	9	22	8 rd.	146	150.00
30	12	26	8 "	194	175.00
30	18	33	8 "	260	210.00
40	12	27	9 "	280	210.00
40	18	34	9 "	320	250.00

BASE JACK

For railroad work, or where a broad base, insuring stability, is required.



FIG. 4885

Tons, Lift	Run Out	Height, Inches	Diameter of Base, Inches	Weight, lbs.	Price, Each
4	12	23	9 1/2	61	\$60.00
7	12	25	10	82	80.00
7	18	31	10	100	85.00
10	12	25	11	109	95.00
10	18	31	11	125	110.00
10	24	39	11	145	125.00
15	12	25	12	135	125.00
15	18	32	12	158	150.00
15	24	39	12	176	175.00
20	12	26	13	169	150.00
20	18	33	13	198	175.00
20	24	39	13	228	200.00
30	9	22	14	210	170.00
30	12	26	14	279	200.00
30	18	33	14	300	225.00
40	12	27	14 1/2	320	240.00
40	18	32	14 1/2	360	280.00
50	12	28	15 1/2	365	280.00
50	18	34	15 1/2	410	310.00

CLAW OR GROUND LIFTING JACK

For machine shops, and for work that will not permit the head to be placed under the load.



FIG. 4886

Tons, Lift	Run Out	Height, Inches	Size of Bottom, Inches	Weight, lbs.	Price, Each
4	12	24	4 sq.	64	\$60.00
7	12	25	4 1/4 "	80	85.00
7	18	31	4 1/2 "	110	88.00
7	24	38	4 1/2 "	123	90.00
10	12	25	6 "	123	100.00
10	18	32	6 "	144	120.00
10	24	39	6 "	170	145.00
15	12	26	6 1/2 "	162	150.00
15	18	32	6 1/2 "	189	185.00
20	12	26	7 "	207	200.00
20	18	33	7 "	245	240.00
30	12	26	8 rd.	310	250.00

DUDGEON'S SQUARE BASE HORIZONTAL JACK

WITH OR WITHOUT REMOVABLE WROUGHT IRON CLAW

This style Jack is used where there is a firm foundation, and is especially adapted for use horizontally, as there is no projecting round base to interfere with placing the Jack on its side.

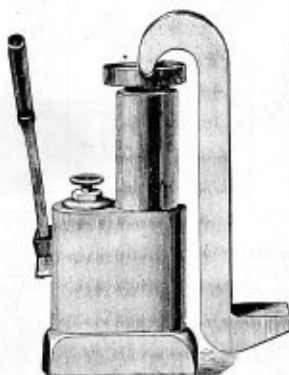


FIG. 4837

Tons	Run Out	Height	Size of Square Base	Weight	Price	Price, with Claw used with Square Base Only
7	12	20	9 x 5 $\frac{1}{2}$	102	\$80	\$85
7	18	26	9 x 5 $\frac{1}{2}$	120	85	90
10	12	20	9 $\frac{1}{2}$ x 7	135	95	105
10	18	26	9 $\frac{1}{2}$ x 7	166	110	125
10	24	32	9 $\frac{1}{2}$ x 7	196	130	150
15	12	21	9 $\frac{1}{2}$ x 7	150	125	150
15	18	26	9 $\frac{1}{2}$ x 7	187	150	180
15	24	32	9 $\frac{1}{2}$ x 7	200	175	215
20	12	21	11 x 8 $\frac{1}{2}$	197	150	185
20	18	27	11 x 8 $\frac{1}{2}$	242	175	215
20	24	33	11 x 8 $\frac{1}{2}$	255	200	250

OVAL BASE HORIZONTAL JACK



FIG. 4888

Tons	Run Out	Height, Inches	Size of Oval Base	Weight	Price	Price with Claw
30	12	22	12 $\frac{1}{2}$ x 9	234	\$200	\$240
30	18	28	12 $\frac{1}{2}$ x 9	285	235	285
40	12	22	13 $\frac{1}{2}$ x 10	320	240	290
40	18	28	13 $\frac{1}{2}$ x 10	355	280	340
50	12	22	14 x 12	335	260	320
50	18	28	14 x 12	380	310	380
60	9	17	14 x 12	320	250	310
60	12	20	14 x 12	350	275	340
60	18	26	14 x 12	410	350	
80	9	19	16 x 13	425	310	
80	12	22	16 x 13	450	335	
80	18	28	16 x 13	525	385	
100	9	19	17 x 14 $\frac{1}{2}$	520	375	
100	12	22	17 x 14 $\frac{1}{2}$	570	400	
100	18	28	17 x 14 $\frac{1}{2}$	660	475	
125	9	19	18 x 16	535	425	
125	12	22	18 x 16	585	450	
125	18	28	18 x 16	685	525	
150	12	23	20 x 18 $\frac{1}{2}$	920	500	
150	18	29	20 x 18 $\frac{1}{2}$	1160	575	
200	12	24	20 x 18 $\frac{1}{2}$	950	600	
200	18	30	20 x 18 $\frac{1}{2}$	1240	700	
250	12	25	20 x 20	1400	725	
250	18	31	20 x 20	1650	850	

Claws for these sizes made to order

SWIVEL CLAW HYDRAULIC JACKS

A very handy small shop tool, so light in weight that it can be carried in the tool boxes of machine and engine erection gangs. The toe of the claw is close to the ground and can be turned to any angle with the operating lever. It will operate either vertically or horizontally.

Capacity Tons	Height In.	Greatest Lift, In.	Height of Claw, In.	Weight Lbs.	Price
7	13	5	1 1/4	46	\$60.00
10	17	6	2	64	70.00



FIG. 4889



FIG. 4890

INDEPENDENT PUMP HYDRAULIC JACKS

There are many situations where it is inconvenient to work the lever of a jack, because of a lack of room or insufficient footing. There are other places where only a short space is available to place the jack, as in forcing off propeller hubs, etc. These conditions are met by the above arrangement. The Pump is a separate unit connected by a flexible metallic pipe to an hydraulic cylinder and ram.

Capacity Tons	Maximum Raise, Inches	Over All Height, Inches	Diameter Ram, Inches	Weight, Pounds	Price, Each
10	4	11	2 3/4	67	\$ 90.00
10	8	13 1/2	2 3/4	80	95.00
10	12	17	2 3/4	98	100.00
10	18	23	2 3/4	128	110.00
20	4	12	3 1/4	94	100.00
20	8	14 1/2	3 1/4	110	105.00
20	12	18	3 1/4	131	110.00
20	18	24	3 1/4	168	120.00

These jacks we can furnish in capacities up to 500 tons.

With Single Plunger Pump



FIG. 4891

With Double Plunger Pump

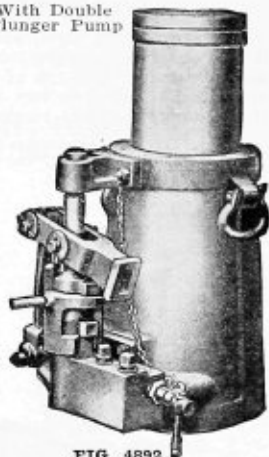


FIG. 4892

**OUTSIDE
PUMP
HYDRAULIC
JACKS
VERTICAL TYPES**

Capacity Tons	Max. Raise In.	Over All Height In.	Diam. Base In.	Single Pump Weight Lbs.	Double Pump	
					Weight Lbs.	Price
60	9	17½	12	325	355	\$220.00
	12	20½		360	400	240.00
	18	26½		485	495	260.00
100	9	17½	13	405	435	275.00
	12	20½		460	495	300.00
	18	26½		550	570	340.00
125	12	21½	14	600	640	360.00
	18	27½		670	700	400.00
150	12	22½	15	800	830	425.00
	18	28½		980	1010	450.00
200	9	21½	18½	1000	1030	450.00
	12	24½		1200	1230	500.00
	18	30½		1500	1530	575.00

HORIZONTAL TYPE

This is another illustration of the adaptability of the outside pump jack. It is used in horizontal presses, for pushing crank pins, moving bridges, boilers, machinery and similar work. The ram is pulled back by a rack and pinion. The jack is here illustrated with a single plunger pump, but it can be equipped with a double plunger pump at no additional cost, but its weight is increased 30 lbs. Arranged for a weighted pull back in place of the rack and pinion, the price is \$25.00 less.

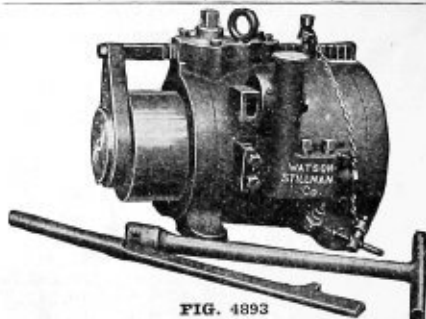


FIG. 4893

Power Tons	Movement In.	Length In.	Diam. of Base, In.	Weight Lbs.	Price
60	12	22	12	350	\$265.00
100	12	22	13	475	325.00
125	12	22	14	590	385.00
150	12	23	15	800	450.00
200	12	23	15	1200	525.00

BARRETT AUTOMOBILE JACKS

No. 088

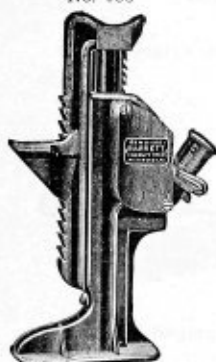


FIG. 4894

No. 311



FIG. 4895

Nos. 100 and 200



FIG. 4896

Jack No.	Capacity	Height Inches	Raise Inches	Foot Lift Adjustment*		Weight with Lever	List Price
				Lowest	Highest		
088	1 ton	11¼	6½	4 in.	10½ in.	8½ lbs.	\$4.00
311	1½ tons	11	7	4 in.	10 in.	14 lbs.	8.00
100	3 tons	10¾	5¼	....	.....	16 lbs.	8.00
200	5 tons	13	6¾	....	.....	28 lbs.	11.00

*Foot Lift Adjustment Nos. 088 and 311 not including "raise."

WEED CHAIN JACK

FOR AUTOMOBILE USES

To lift a car with the Weed Chain Jack, simply give a few pulls on its chain while you stand away from springs, tire carriers and other projections. To lower the car, pull the chain in the opposite direction.

The Jack that saves your back. Never gets out of order. Gears and chain wheel protected by a stamped steel housing. Chain heavily plated to prevent rusting. Has a strong cap, providing the kind of support from which an axle will not slip, while a broad base prevents the jack from upsetting on uneven roads. Every Weed Chain Jack is submitted to a lifting test and will support over twice the weight it is ever required to lift.

The 8 inch and 10 inch sizes are made with an Auxiliary Step as shown in the accompanying illustration. When in operative position it adds two inches to the height of the jack.



FIG. 4897

Size	Height when Lowered	Height when Raised	Height when Raised with Aux. Step Up	Price
2 inch	8 inches	12½ inches	14½ inches	\$ 5.00
10 inch	10 inches	15¾ inches	17¾ inches	5.00
12 inch	12 inches	18½ inches	No. Aux. Step	5.00
12 in. Truck	12 inches	19¼ inches	No. Aux. Step	10.00

THE E-S COMBINATION JACK

AUTO-TURN JACK AND TOWING JACK

For Garage Use



FIG. 4898

For Towing In Crippled Cars

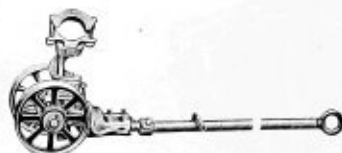


FIG. 4899

One man can easily move around the heaviest car in cramped space.

The Combination Jack may rightly be called the biggest time saver and the most convenient article in the garage.

It costs nowhere near as much as a turntable, but will turn cars more quickly and more easily.

It is perfectly adapted to moving cars anywhere about the garage, no matter how cramped the space. The heaviest car can be easily and quickly handled by one man.

The Combination Jack may be converted into a towing truck in three minutes when needed for towing in a disabled car.

Adjustable in one motion to any height of axle.

Will save its whole cost to any garage in a month—sometimes in a single week.
List priceeach \$40.00

FIVE MINUTE VULCANIZER, MODEL "E"



FIG. 4900

A light and handy outfit for the quick repair of tube punctures.

Uses common gasoline—the most convenient and dependable fuel.

Will vulcanize your tubes anywhere in five minutes.

Designed on the same proven principles that have made Adamson Vulcanizers the most practical and largest selling line in the world.

Sells complete with box of one dozen Adamson 5-Minute Repair Gum Patches, for.....\$1.00
Extra box of 12 patches.....only .25

GRACEY'S IMPROVED DOUBLE ACTING RATCHET PULLING JACK

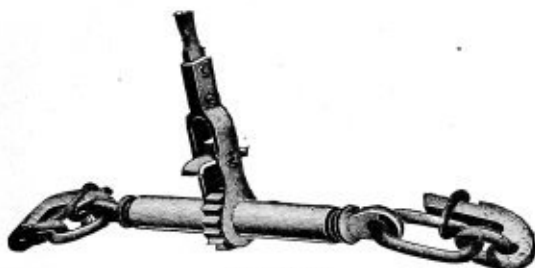


FIG. 4901

A handy tool for use in railroad and building construction, etc., where a pulling jack must be used overhead. Jack may be reversed or changed so that it will let go instead of pull up, or vice versa, by simply pressing down on the high side of the fall.

GRACEY'S OLD STYLE (LOOSE FALL) STEAMBOAT TOWING RATCHET



FIG. 4902

This style of Jack is used principally in hitching tows and for river and steamboat work generally, and is a most useful, economic and reliable tool for coal and lumber landings, wharves and, in fact, any place where such movable articles as floats, rafts, barges, etc., must be held firm and fast.

PRICE LIST, EITHER ABOVE STYLES

1½ INCH DIAMETER SCREW—7 TONS CAPACITY

18 inch barrel.	Draw 16 inches.....	list price, each	\$ 7.00
24 inch barrel.	Draw 22 inches.....	list price, each	7.50
30 inch barrel.	Draw 28 inches.....	list price, each	8.00
36 inch barrel.	Draw 34 inches.....	list price, each	9.50

1¾ INCH DIAMETER SCREW—15 TONS CAPACITY

24 inch barrel.	Draw 22 inches.....	list price, each	16.00
30 inch barrel.	Draw 28 inches.....	list price, each	17.00
36 inch barrel.	Draw 34 inches.....	list price, each	18.00
48 inch barrel.	Draw 46 inches.....	list price, each	20.00

STEEL SCREW PUNCHES

In ordering punches and dies state size of rivets for which they are to be used, and we will make allowance for clearance. Our system of marking punches and dies is that the size stamped on them denotes the size rivet for which they are to be used. A punch and die marked $\frac{1}{2}$ indicates that they are for $\frac{1}{2}$ inch rivet, but they will punch holes about $\frac{7}{8}$ inch diameter.

The limit of the sizes of punches that can be used with the standard couplings as furnished with the screw punches are as follows: No. 0, $\frac{1}{16}$ in. rivets; Nos. 1 and 2, $\frac{1}{8}$ in. rivets; Nos. 3 and $3\frac{1}{2}$, $\frac{3}{16}$ in. rivets; No. 4, $1\frac{1}{4}$ in. rivets. With the use of special couplings the Nos. 1 and 2 screw punches will take punches for $\frac{7}{8}$ in. rivets, and the Nos. 3 and $3\frac{1}{2}$ for 1 in. rivets.

Each machine is fitted with one punch and die, and other than these are charged for extra.



FIG. 4903

No. 0.	Punches $\frac{1}{16}$ inch hole in $\frac{1}{4}$ inch iron, $1\frac{1}{2}$ inches from edge of sheet, 15 lbs.	\$24.00
No. 1.	Punches $\frac{1}{8}$ inch hole in $\frac{3}{8}$ inch iron, $1\frac{1}{2}$ inches from edge of sheet, 24 lbs.	30.00
No. 2.	Punches $\frac{3}{16}$ inch hole in $\frac{1}{2}$ inch iron, 2 inches from edge of sheet, 40 lbs.	40.00
No. 3.	Punches $\frac{3}{8}$ inch hole in $\frac{3}{4}$ inch iron, $2\frac{1}{2}$ inches from edge of sheet, 62 lbs.	60.00
No. $3\frac{1}{2}$.	Punches $\frac{3}{4}$ inch hole in $\frac{3}{4}$ inch iron, 4 inches from edge of sheet, 80 lbs.	75.00
No. 4.	Punches 1 inch hole in 1 inch iron, $4\frac{1}{4}$ inches from edge of sheet, 145 lbs.	90.00
No. 5.	Punches 1 inch hole in $\frac{3}{4}$ inch iron, 6 inches from edge of sheet, 200 lbs.	125.00

PRICE LIST OF PUNCHES AND DIES

For No. 0, screw punches, per pair (punch and die).....	\$3.50
For Nos. 1 and 2, screw punches, per pair (punch and die).....	4.00
For Nos. 3 and $3\frac{1}{2}$, screw punches, per pair (punch and die).....	5.00
For No. 4, screw punch, punches smaller than $\frac{7}{8}$ inch, each.....	2.50
For No. 4, screw punch, punches $\frac{7}{8}$ inch and larger, each.....	3.50
For No. 4, screw punch, dies of all sizes.....	3.50

HYDRAULIC HEAD PUNCH



FIG. 4904

In ordering punches and dies state whether the given size denotes the diameter of hole to be punched or the size rivet or bolt for which they are to be used.

The punches and dies carried in stock are rivet sizes, so it will facilitate deliveries to order such instead of specifying actual sizes.

No.	Rivet Hole	Iron	Gap	Weight	List Price
1	$\frac{1}{16}$ "	$\frac{1}{8}$ "	$1\frac{1}{8}$ "	55 lbs.	\$ 60.00
2	$\frac{1}{8}$ "	$\frac{1}{4}$ "	2"	90 lbs.	85.00
$3\frac{1}{2}$	$\frac{3}{16}$ "	$\frac{1}{2}$ "	$5\frac{3}{4}$ "	190 lbs.	120.00
3	$\frac{1}{4}$ "	$\frac{3}{8}$ "	5"	140 lbs.	100.00
$3\frac{1}{2}$	$\frac{3}{8}$ "	$\frac{1}{2}$ "	$2\frac{1}{4}$ "	140 lbs.	120.00
4	$\frac{1}{2}$ "	$\frac{3}{4}$ "	6"	180 lbs.	140.00
$3\frac{1}{2}$	$\frac{3}{4}$ "	1"	4"	170 lbs.	140.00
5	1"	$1\frac{1}{4}$ "	3"	195 lbs.	140.00
6	1"	$1\frac{1}{2}$ "	$4\frac{1}{4}$ "	250 lbs.	165.00
8	1"	1"	$3\frac{1}{2}$ "	230 lbs.	165.00

TEST OR PRESSURE PUMP

Will generate a cold water pressure of 500 lbs. per square inch, and are adapted for testing boilers, cleaning pipes, etc.

No.	Diameter of Plunger, Inches	Suction and Discharge, Inches	Stroke, Inches	Price, Single	Price, Double
1	1	$\frac{3}{4}$	4	\$14.00	\$.....
2	$1\frac{1}{2}$	1	4	16.00	.....
3	$1\frac{3}{4}$	$1\frac{1}{4}$	6	20.00	60.00
4	2	$1\frac{1}{2}$	6	30.00	90.00

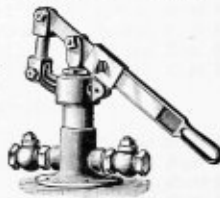


FIG. 4905

PUNCHES—CONTINUED

HYDRAULIC SCREW PUNCH

UPRIGHT PATTERN

Has no valves and force pumps thus permitting its use in any position. An excellent tool for light work.



FIG. 4906

No.		Wt., Lbs.	Price
1	Punches $\frac{5}{8}$ -inch hole in $\frac{3}{8}$ -inch iron, 1 $\frac{1}{4}$ inches from edge of sheet.....	50	\$60.00
2	Punches $\frac{3}{4}$ -inch hole in $\frac{1}{2}$ -inch iron, 2 inches from edge of sheet.....	85	85.00
2 $\frac{1}{2}$	Punches $\frac{3}{4}$ -inch hole in $\frac{1}{2}$ -inch iron, 5 inches from edge of sheet.....	130	100.00
3	Punches $\frac{3}{4}$ -inch hole in $\frac{3}{4}$ -inch iron, 2 $\frac{1}{4}$ inches from edge of sheet.....	130	120.00
3 $\frac{1}{2}$	Punches $\frac{3}{4}$ -inch hole in $\frac{3}{4}$ -inch iron, 4 $\frac{1}{8}$ inches from edge of sheet.....	180	140.00

HYDRAULIC SCREW PUNCH

HORIZONTAL PATTERN

Similar in all respects to the Upright Pattern, excepting the screw is at right angle to the ram, being a more convenient position for certain locations and shapes to be punched. This Punch is also fitted with pinion for raising ram.

No.		Wt., Lbs.	Price
1	Punches $\frac{5}{8}$ -in. hole in $\frac{3}{8}$ -in iron, 2 in. from edge of sheet.....	50	\$60.00
2	Punches $\frac{3}{4}$ -in. hole in $\frac{1}{2}$ -in. iron, 2 $\frac{5}{8}$ in. from edge of sheet....	85	85.00
3	Punches $\frac{3}{4}$ -in. hole in $\frac{3}{4}$ -in. iron, 3 $\frac{1}{8}$ in. from edge of sheet....	120	100.00

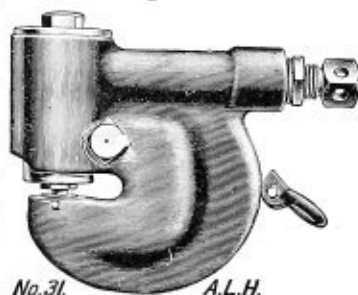


FIG. 4907

STRUCTURAL IRON PUNCH

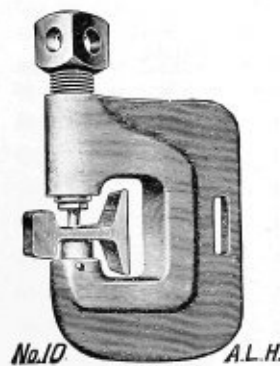


FIG. 4908

No.	Depth of Gap, inches	Height of Gap, inches	Capacity, Inch	Weight, lbs.	List Price
10	2 $\frac{1}{4}$	3 $\frac{1}{2}$	$\frac{3}{4}$ in $\frac{3}{4}$	55	\$25.00
12	3	4 $\frac{1}{2}$	$\frac{3}{4}$ " $\frac{1}{2}$	80	30.00
14	4	4 $\frac{3}{4}$	1 " $\frac{1}{2}$	150	44.00
16	5 $\frac{1}{2}$	6 $\frac{1}{2}$	1 " $\frac{1}{2}$	180	50.00

One punch and die fitted in each machine. Extra punches and dies charged for according to shape of material to be punched. In ordering punches and dies state whether the given size denotes diameter of hole to be punched or the size rivet for which they are to be used.

IMPROVED HYDRAULIC PUNCH

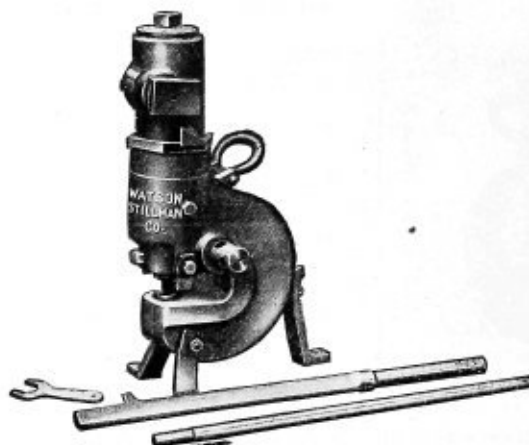


FIG. 4909

This tool has been improved very much over the original design. A much improved pump and lowering device has been introduced, the punch made very much lighter, and a new raising device has been put in, by which the punch can be pushed down to the work without the labor of pumping, and, at the same time, made much more durable.

The punch is driven down by operating the pump inside the head or reservoir, the piston of which is connected to the socket in which the upper lever is shown. It is raised by bringing the socket down against the lug on head and pushing down the lower socket by a second lever, which does not interfere with that of the pump.

All parts are readily accessible, and very carefully designed to avoid the tricky working and short wearing quality of previous designs of this class of tools. The head may be turned to bring the lever to any desired position, and irregular dies may be used without danger. Body and working parts are steel.

Size	Diam. of Hole	Thickness of Iron	No. of Gland Special	No. of Punch Special	No. of Die Special	Weight in Lbs. 30	Price
0	$\frac{7}{8}$ in.	$\frac{1}{8}$ in.					\$ 85.00
1	$\frac{3}{4}$ in.	$\frac{1}{2}$ in.	4	4	4	105	110.00
1x	$\frac{3}{4}$ in.	$\frac{1}{2}$ in.	4	4	4	140	150.00
2	1 in.	$\frac{5}{8}$ in.	5	5	4	130	140.00
2x	1 in.	$\frac{5}{8}$ in.	5	5	4	165	175.00
3	1 $\frac{1}{4}$ in.	$\frac{3}{4}$ in.	6	6	5	220	175.00
3x	1 $\frac{1}{8}$ in.	$\frac{3}{4}$ in.	6	6	5	300	200.00
4	1 $\frac{3}{4}$ in.	1 in.	7	7	6	325	225.00

One Round Punch and Die furnished with each tool.

HYDRAULIC PUNCH

FOR WEB OF "JOHNSON" STREET GIRDER RAILS

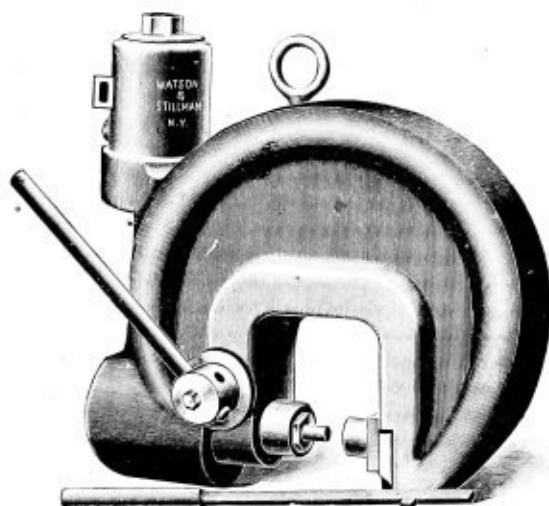


FIG. 4910

In punching street railroad girder rails of this pattern when in place a special form of our Hydraulic Punch has to be used. The head of the rail being very wide and the punch low down, none of our ordinary forms were convenient, which rendered this form of tool necessary. Our recent improvement, whereby the ram can be brought down to the work without the loss of time and labor of pumping has been augmented by placing the die in a sliding block which can be removed by simply raising a latch, thus getting a clear opening of five inches and at the same time keeping the length of the cylinder short enough to not be in the way of the work, the head smaller and the whole tool lighter. This form of tool can also be furnished for punching "I" beams. The tool is steadied by bringing the punch against the work, with the quick-acting lever, before beginning to operate the pumping lever. The upper socket must be brought down against the lug on the head before the quick-acting lever can be used.

Size	Diameter of Hole	Thickness	Depth of Jaw	Weight	Price
2	1 in.	$\frac{1}{2}$ in. (iron)	5 in.	280 lbs.	\$225.00
3	1 in.	$\frac{1}{2}$ in. (steel)	$8\frac{1}{4}$ in.	550 lbs.	250.00
4	$1\frac{1}{4}$ in.	$\frac{1}{2}$ in. (steel)	$8\frac{1}{4}$ in.	675 lbs.	325.00

PORTABLE HYDRAULIC BEAM PUNCH

NO. 2, 7-INCH OPEN JAW PATTERN FOR PUNCHING
ANGLES, "T" BARS AND BEAM WEBS

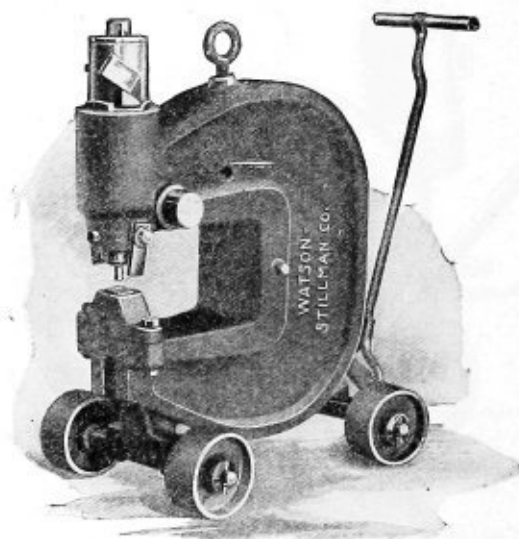


FIG. 4911

This punch is operated by a pump worked by a lever inserted in the socket shown on the side of the head. The parts are all easy of access and reliable, and the head may be turned to operate the lever from any position. The body of the punch is steel. The throat is 7 inches deep by 10 inches, allows a beam to be punched close to the flange or 7 inches from edge. It also allows angle or "T" iron to be punched without pushing lengthwise through the punch.

One movement of the lever in the lower socket withdraws the punch entirely from the iron, or brings the punch down on the work without the labor and loss of time necessary to pump it down.

The punches are prevented from turning, thus allowing the use of irregular shaped dies without danger of the punch coming down on the die. The hand-ring is put on for lifting or suspending the punch.

Capacity of punch, with one man on lever, 1 inch round hole in $\frac{1}{2}$ inch iron.

Fitted with No. 2 Punch Head, Gland No. 6, Punch No. 6, Die No. 5.

Weight, 475 lbs.

Price\$200.00

DUFF (DUNN PATENT) TRENCH AND EXCAVATION BRACES

DUFF ALL IRON EXTENSIBLE TRENCH BRACE

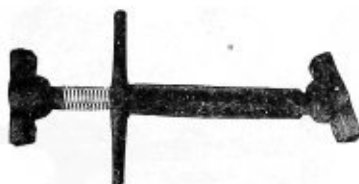


FIG. 4912

There are nearly 1,000,000 of these braces in use both in this country and abroad. These braces are far cheaper and safer than the old style wooden struts, which are difficult to wedge in position and always uncertain and dangerous. This brace is light and strong, and is easily adapted to any width of ditch by merely changing the tubing which is standard gas pipe. The screws have double threads, giving quick travel to the lever nut. Extensible to about one-half the length of the screw.

Size of Screw Inches	Length of Brace Closed	Weight Per Doz.	List Price Per Doz.	Size of Screw Inches	Length of Brace Closed	Weight Per Doz.	List Price Per Doz.
1½x11	16"	200 lbs.	\$23.00	1½x18	42"	312 lbs.	\$38.00
1½x12	18"	210 lbs.	23.00	1½x18	48"	325 lbs.	29.00
1½x14	21"	222 lbs.	24.00	2 x18	36"	542 lbs.	51.00
1½x14	24"	234 lbs.	24.00	2 x18	42"	564 lbs.	52.00
1½x16	27"	246 lbs.	26.00	2 x18	48"	586 lbs.	53.00
1½x16	30"	256 lbs.	26.00	2 x18	54"	608 lbs.	54.00
1½x18	36"	280 lbs.	27.00	2 x18	60"	630 lbs.	55.00

DUFF FITTINGS FOR ALL IRON BRACES

Duff trench braces are furnished in this form to contractors who wish to put on pipe to suit themselves. Ordinary gas pipe is all that is required for the barrel. No machine work is necessary other than to drill a small hole in one end of the pipe which permits the insertion of a cotter pin which holds the brace together. The screws used in all styles of trench braces shown on this page are of the same standard. Thus a screw can be used either in connection with pipe or with washer plates on timber braces as shown below. Extensible to about one half the length of the screw.

Size of Screw	Weight per Dozen Pounds	List Price Complete	List Price Screw Ends Only
1½x12"	185	\$20.00	\$15.00
1½x14"	192	21.00	16.00
1½x16"	204	22.00	17.00
1½x18"	208	23.00	18.00
2 x18"	440	45.00	33.00



FIG. 4913

DUFF COMBINED SCREW AND TIMBER BRACES

This style of brace is used in any width of trench from two to thirty feet. It will be found especially valuable in wide and deep trench work. It is also used to good advantage in vertical bracing. When required, caps can be furnished for the butt end of the brace. Timbers are not furnished. In ordering, give diameter and length of screw and size of cap wanted. Extensible to about one half the length of the screw.

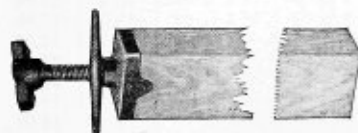


FIG. 4914

Size of Screw	Size of Cap	Weight Per Doz.	List Price Per Doz.	Butt Caps Per Doz.
1½x14"	4x 4"	175 lbs.	\$18.00	\$ 3.00
1½x14"	6x 6"	192 lbs.	20.00	4.00
1½x18"	6x 6"	214 lbs.	22.00	4.00
2 x18"	6x 6"	384 lbs.	38.00	5.00
2 x18"	8x 8"	410 lbs.	40.00	7.00
2 x18"	10x10"	450 lbs.	42.00	10.00
2 x18"	9x12"	444 lbs.	44.00	11.00

FAIRBANKS TRIP SCALES WITH SCOOP AND PLATE



FIG. 4915



FIG. 4916

Nickel-plated loose weights may be obtained in convenient units to give up to full capacity. Finished in durable and attractive baked enamel, maroon color.

Scales will be sent without weights unless otherwise ordered.

WITH SCOOP AND PLATE WITHOUT SIDE BEAM

Code No.	EQUIPMENT	Capacity	Prices	
			Without Weights	With Weights
921	Tin scoop and 10 $\frac{3}{4}$ " iron plate.....	25 lbs. x $\frac{1}{4}$ oz.	\$20.00	\$24.00
701	Tin scoop and 8 $\frac{3}{4}$ " iron plate.....	16 lbs. x $\frac{1}{4}$ oz.	15.00	18.00
702	Tin scoop and 7" iron plate.....	10 lbs. x $\frac{1}{4}$ oz.	11.50	14.00
703	Tin scoop and 6" iron plate.....	6 lbs. x $\frac{1}{4}$ oz.	10.50	12.00
704	Tin scoop and 5" iron plate.....	2 lbs. x $\frac{1}{4}$ oz.	10.00	11.00
923	Brass scoop and 10 $\frac{3}{4}$ " iron plate.....	25 lbs. x $\frac{1}{4}$ oz.	22.00	26.00
709	Brass scoop and 8 $\frac{3}{4}$ " iron plate.....	16 lbs. x $\frac{1}{4}$ oz.	17.00	20.00
710	Brass scoop and 7" iron plate.....	10 lbs. x $\frac{1}{4}$ oz.	13.50	16.00
711	Brass scoop and 6" iron plate.....	6 lbs. x $\frac{1}{4}$ oz.	11.50	13.00
712	Brass scoop and 5" iron plate.....	2 lbs. x $\frac{1}{4}$ oz.	11.00	12.00

WITH SCOOP, PLATE SIDE BEAM

Code No.	EQUIPMENT	Capacity	Side Beam	Prices	
				Without Weights	With Weights
922	Tin scoop and 10 $\frac{3}{4}$ " iron plate..	25 lbs. x $\frac{1}{4}$ oz.	32 x $\frac{1}{4}$ oz.	\$23.50	\$26.00
705	Tin scoop and 8 $\frac{3}{4}$ " iron plate..	16 lbs. x $\frac{1}{4}$ oz.	16 x $\frac{1}{4}$ oz.	17.00	19.00
706	Tin scoop and 7" iron plate..	10 lbs. x $\frac{1}{4}$ oz.	16 x $\frac{1}{4}$ oz.	13.50	15.00
707	Tin scoop and 6" iron plate..	6 lbs. x $\frac{1}{4}$ oz.	16 x $\frac{1}{4}$ oz.	12.00	13.00
708	Tin scoop and 5" iron plate..	2 lbs. x $\frac{1}{4}$ oz.	8 x $\frac{1}{4}$ oz.	11.50	12.00
924	Brass scoop and 10 $\frac{3}{4}$ " iron plate	25 lbs. x $\frac{1}{4}$ oz.	32 x $\frac{1}{4}$ oz.	25.50	28.00
713	Brass scoop and 8 $\frac{3}{4}$ " iron plate	16 lbs. x $\frac{1}{4}$ oz.	16 x $\frac{1}{4}$ oz.	19.00	21.00
714	Brass scoop and 7" iron plate	10 lbs. x $\frac{1}{4}$ oz.	16 x $\frac{1}{4}$ oz.	15.50	17.00
715	Brass scoop and 6" iron plate	6 lbs. x $\frac{1}{4}$ oz.	16 x $\frac{1}{4}$ oz.	13.00	14.00
716	Brass scoop and 5" iron plate	2 lbs. x $\frac{1}{4}$ oz.	8 x $\frac{1}{4}$ oz.	12.50	13.00

FAIRBANKS COUNTER SCALES

WITH SCOOP OR PLATE



Hardened steel bearings. Polished Brass Beams, with hanging poise. Maroon finish.

FIG. 4917

Code No.	DESCRIPTION	Capacity	Beam	List Price
554	Single Beam Tin Scoop.....	35 lbs. x $\frac{1}{2}$ oz.	5 lbs. x $\frac{1}{2}$ oz.	\$15.00
556	Single Beam Brass Scoop.....	35 lbs. x $\frac{1}{2}$ oz.	5 lbs. x $\frac{1}{2}$ oz.	17.00
555	Single Beam $\frac{1}{2}$ Bu. Tin Scoop.....	35 lbs. x $\frac{1}{16}$ oz.	8 ozs. x $\frac{1}{16}$ oz.	18.00
565	Single Beam $\frac{1}{2}$ Bu. Brass Scoop.....	35 lbs. x $\frac{1}{16}$ oz.	8 ozs. x $\frac{1}{16}$ oz.	21.00
557	Single Beam 10" Round Iron Plate...	35 lbs. x $\frac{1}{16}$ oz.	8 ozs. x $\frac{1}{16}$ oz.	14.00
564	Single Beam 10" Square Glass Plate...	23 lbs. x $\frac{1}{2}$ oz.	5 lbs. x $\frac{1}{2}$ oz.	15.00
566	Double Beam 10" Square Glass Plate...	23 lbs. x $\frac{1}{2}$ oz.	5 lbs. x $\frac{1}{2}$ oz.	17.00
590	Single Beam Tin Scoop.....	8 lbs. x $\frac{1}{16}$ oz.	5 ozs. x $\frac{1}{16}$ oz.	12.00
592	Single Brass Scoop.....	8 lbs. x $\frac{1}{16}$ oz.	5 ozs. x $\frac{1}{16}$ oz.	14.00

POSTAL SCALES

Polished Brass Beams and Pans. Bearings of hardened steel. Finished in black and gold.



FIG. 4918

Code No.	Description	Capacity	Beam		Pan	Price
			Front	Back		
613	Single beam	1 lb. x $\frac{1}{2}$ oz.	.....	.....	4 $\frac{3}{4}$ " x 3 $\frac{1}{4}$ "	\$ 7.00
605	Single beam	4 lbs. x $\frac{1}{2}$ oz.	.....	.....	8" x 7"	12.00
615	Double beam	15 lbs. x $\frac{1}{2}$ oz.	5 lbs. x $\frac{1}{2}$ oz.	10 x 5 lbs.	10 $\frac{1}{2}$ " x 10 $\frac{1}{2}$ "	18.00

FAIRBANKS PLATFORM COUNTER SCALES



FIG. 4919

With Single Beam

UNION SCALE

Heavy cast iron frame, platform and levers. Hardened steel bearings. Polished brass arrow-pointed beam and hanging poise. Split hoop scoop.

Capacity, 30 lbs. x $\frac{1}{2}$ oz. in scoop.

240 lbs. x $\frac{1}{4}$ lb. on platform.

Code No.	DESCRIPTION	Capacity	Platform	Prices
508	Single Beam, Tin Scoop.....	240 lbs.	10 $\frac{1}{2}$ " x 13 $\frac{1}{2}$ "	\$18.00
510	Single Beam, Brass Scoop.....	240 lbs.	10 $\frac{1}{2}$ " x 13 $\frac{1}{2}$ "	20.00
512	Double Beam, Tin Scoop.....	240 lbs.	10 $\frac{1}{2}$ " x 13 $\frac{1}{2}$ "	20.00
514	Double Beam, Brass Scoop.....	240 lbs.	10 $\frac{1}{2}$ " x 13 $\frac{1}{2}$ "	22.00

Note.—In the platform sizes above, the first figure is the dimension parallel with the beam.

"IMPERIAL" SCALE

Strongly built of metal throughout for heavy service. All bearings of hardened steel.

Beam graduations—upper bar, 15 lbs. x 1 oz. Lower bar, 50 lbs. x $\frac{1}{2}$ lb.

Scale No. 521 is furnished with marble platform without scoop.

Finished in Maroon with nickel plated beam and weights.

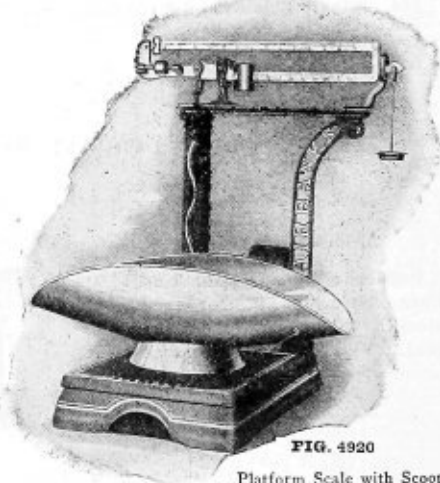


FIG. 4920

Platform Scale with Scoop

Code No.	DESCRIPTION	Capacity	Platform	Prices
505	Seamed Tin Scoop.....	250 lbs. x 1 oz.	12 "x15 "	\$36.00
507	Seamed Brass Scoop.....	250 lbs. x 1 oz.	12 "x15 "	38.00
521	Marble Platform Only.....	250 lbs. x 1 oz.	12 $\frac{1}{2}$ " x 15 $\frac{1}{2}$ "	36.00

Note.—In the platform sizes above, the first figure is the dimension parallel with the beam.

FAIRBANKS PLATFORM COUNTER SCALES WITH SHORT IRON PILLAR

All metal heavy construction with polished brass arrow-pointed beams and sliding poises.

Scales Nos. 1216 and 1220 are constructed with suspension bearings. No. 1220 has brass weights.

Finished in black and gold.



FIG. 4921

Code No.	Capacity	Beam	Platform	Height Over All	Price
528	200 lbs. x 1 oz.	5 lbs. x 1 oz.	10½" x 14 "	18½"	\$24.00
1212	300 lbs. x 2 oz.	10 lbs. x 2 oz.	13½" x 19½"	28 "	32.00
1216	300 lbs. x ¼ oz.	3 lbs. x ¼ oz.	13½" x 19½"	28 "	40.00
1220	300 lbs. x ¼ oz.	3 lbs. x ¼ oz.	13½" x 19½"	28 "	60.00

WITH FULL CAPACITY BEAM

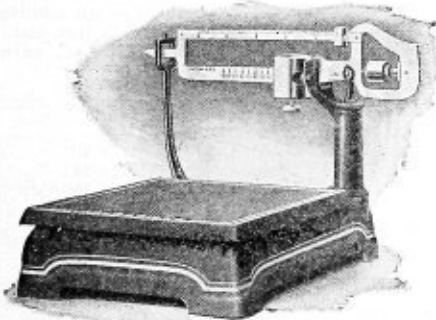


FIG. 4922

Full capacity brass beam with sliding poises. Hardened steel bearings. Maroon finish.

Code No.	Capacity	Beam	Platform	Price
532	55 lbs. x 1 oz.	{ Upper—5 lbs. x 1 oz. } { Lower—50 x 5 lbs. }	10½" x 12"	\$24.00

Note—In the platform size above, the first figure is the dimension parallel with the beam.

FAIRBANKS PORTABLE PLATFORM SCALES



With wheels

FIG. 4923



With wheels and drop lever

FIG. 4924

PORTABLE PLATFORM SCALE, WITH WHEELS

Code No.	Capacity	Beam	Platform	Price
1116	2500 lbs.	100 x $\frac{1}{2}$ lbs.	25" x 34"	\$90.00
1118	2000 lbs.	100 x $\frac{1}{2}$ lbs.	25" x 33"	80.00
1120	1500 lbs.	100 x $\frac{1}{2}$ lbs.	22" x 31"	60.00
1124	1000 lbs.	100 x $\frac{1}{2}$ lbs.	18" x 27"	43.00
1128	500 lbs.	50 x $\frac{1}{4}$ lbs.	16" x 25"	33.00

This type of Portable Platform Scale is one of the most efficient for general use and may be furnished either with or without wheels. It is equipped with arrow-tip single beam having a sliding poise with set-screw, all of brass. It may also be furnished with double beam, or full capacity beam at an additional price. From 1,500-pound capacity up, all sizes have pillar braced with iron rod.

Durably and attractively finished in blue and gold, all well varnished for protection.

WITH DROP LEVER AND WHEELS

Code No.	Capacity	Beam	Platform	Price
1164	3000 lbs.	100 x $\frac{1}{2}$ lbs.	31" x 40"	\$125.00
1167	3000 lbs.	100 x $\frac{1}{2}$ lbs.	26" x 34"	114.00
1166	2500 lbs.	100 x $\frac{1}{2}$ lbs.	25" x 34"	100.00
1168	2000 lbs.	100 x $\frac{1}{2}$ lbs.	25" x 32"	90.00
1170	1500 lbs.	100 x $\frac{1}{2}$ lbs.	22" x 31"	70.00
1174	1000 lbs.	100 x $\frac{1}{2}$ lbs.	18" x 27"	53.00
1178	500 lbs.	50 x $\frac{1}{4}$ lbs.	16" x 25"	43.00

In weighing heavy boxes, cases, or other similar loads, the scale platform is always subjected to considerable jar and impact when goods are taken on and off the scale. To relieve the scale mechanism from the racking results of such treatment, a drop lever is provided on this scale, which when raised, acts to lower the lever system so that the platform comes to rest on lugs at the four corners. In weighing, the drop lever is brought down and fastened under a convenient hook on the cap, thus raising the platform from the lugs into its free weighing position.

All sizes have pillar braced with iron rod. Beam is single, of the arrow-tip pattern, of brass with sliding poise and set-screw.

Note.—In the platform sizes above, the first figure is the dimension parallel with the beam.

FAIRBANKS PORTABLE PLATFORM SCALES

ALL METAL WITH INCLINE BRACKETS

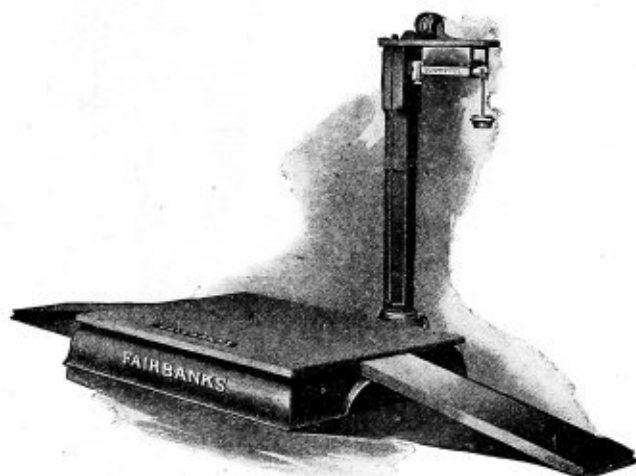


FIG. 4925

The scale shown above is strongly built of metal throughout, adapted for weighing wheelbarrow loads or for general use in the metal, fertilizer or similar trades. A bracket is cast on each end of the frame to form a rest for an incline, so that a wheelbarrow load may be easily run on the platform. A set of two wooden inclines is furnished regularly with the scale without extra charge. The arrow-tip beam is regularly single, graduated 100 x 1 lbs., but may be supplied graduated to $\frac{1}{2}$ lb. if so ordered. It is of brass with set-screw poise. The scale is furnished either with or without wheels. Finished durably and attractively in black and gold, all well varnished for protection.

ALL METAL WITH INCLINE BRACKETS, WITHOUT WHEELS

Code No.	Capacity	Platform	Price
1382	1000 x 1 lbs.	42" x 30"	\$ 95.00
1389	2000 x 1 lbs.	44" x 35"	120.00

ALL METAL WITH INCLINE BRACKETS AND WHEELS

1384	1000 x 1 lbs.	42" x 30"	\$100.00
1390	2000 x 1 lbs.	44" x 35"	125.00

Note.—In the platform sizes above, the first figure is the dimension parallel with the beam.

FAIRBANKS PORTABLE PLATFORM SCALES **WITH RACK PLATFORM**



FIG. 4926

For convenient weighing under severe service, this strong, heavy scale is provided with an extra iron-covered wood platform with iron racks. Large rubber cushions are placed between the two platforms to absorb the shock and strain of loading and unloading, and a drop lever mechanism may also be provided to further protect the levers and bearings from wear. Large, solid, reinforced web wheels are used, bringing the platform high so that overhanging loads will clear the ground. A fifth wheel construction with convenient handle, allows scale to be easily turned in small space. The arrow-tip beam is single, of brass with set-screw poise.

WITH RACK PLATFORM, WITHOUT DROP LEVER

Code No.	Capacity	Beam	Platform	Height of Platform	Price
1416	2500 lbs.	100 x 1½ lbs.	25" x 32"	24"	\$150.00
1420	6000 lbs.	200 x 1 lbs.	31" x 40"	27"	220.00
1424	10000 lbs.	200 x 1 lbs.	31" x 40"	31"	270.00

WITH RACK PLATFORM AND DROP LEVER

1428	2500 lbs.	100 x 1½ lbs.	25" x 32"	24"	150.00
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Note.—In the platform sizes above, the first figure is the dimension parallel with the beam.

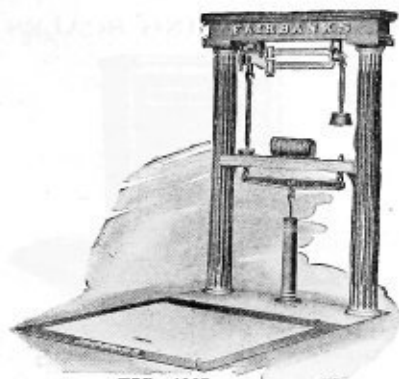


FIG. 4927

FAIRBANKS WAREHOUSE SCALES

This is one of the most popular types of self-contained scales for installation flush with the floor, to weigh heavy, bulky merchandise on trucks, grain in sacks, or for similar service. While here shown with tall iron pillars and double beam, it may be furnished as well with short iron pillars and with single beam, full capacity beam or type-registering beam as desired, the double beam being recommended for general use.

The double beam is of brass with brass set-screw poise on lower bar for taking tare and plain poise on upper bar.

With Tall Iron Pillars					With Short Iron Pillars				
Code No.	Capacity	Platform	Platform to Beam Support	List	Code No.	Capacity	Platform	Platform to Beam Support	List
996	6000x 1 lbs.	60"x54"	21 "	\$310.00	995	6000x 1 lbs.	60"x54"	21 "	\$280.00
1046	5000x ½ lbs.	48"x49"	23 "	230.00	1035	5000x ½ lbs.	48"x49"	23 "	200.00
1048	3500x ½ lbs.	42"x44"	12 ½ "	180.00	1053	3500x ½ lbs.	42"x44"	20 "	170.00
1052	3500x ½ lbs.	42"x44"	20 "	200.00	1041	2500x ½ lbs.	47"x37"	12 "	135.00
1050	2500x ½ lbs.	47"x37"	12 "	165.00	1043	1500x ½ lbs.	43"x33"	15 ½ "	130.00
1063	1500x ½ lbs.	43"x34"	12 "	160.00					

Note.—In above platform sizes, the first figure is dimension parallel with the beam.

FAIRBANKS DIAL INDICATOR

The Fairbanks Dial Indicator is regularly made in two sizes, listed below, one for use with heavy duty scales, as required for freight and baggage service, and the other for regular warehouse duty as ordinarily found in business establishments. On account of its unique principle of obtaining full capacity on the dial, the scale may readily be made of any required capacity, upon order, with dial and tare beam graduations to suit. The dial may be furnished with double face to be read from either side and extended beam may be provided with bottle weight to increase the total scale capacity. The dial itself may be readily applied to any existing platform scale now in good working order.

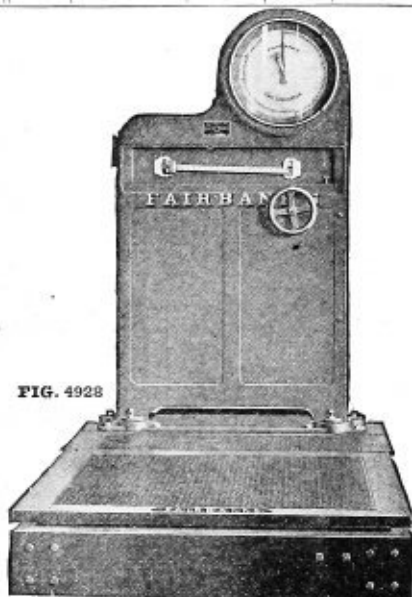


FIG. 4928

Code No.	Capacity	Dial	Tare Beam	Dial Size
10742	2,000x1 lbs.	200x1 lbs.	200x1 lbs.	15 in.
10743	10,000x5 lbs.	1,000x5 lbs.	1,000x5 lbs.	15 in.

Prices upon application.

FAIRBANKS METAL TRADES AND MINING SCALES

BUILT-IN SCALE WITH BEAM BOX

This scale sets directly into ground or floor so that the loads may easily come onto the platform. It is built strong, with heavy parts, to sustain the weight of coal, ore, metal and other heavy material and to withstand the effects of jar and shock due to loading and unloading. The scale is thus very practical and efficient for duty at mine, dock, terminal or industrial plant, being also suitable for use with narrow gage track or industrial rail ways.

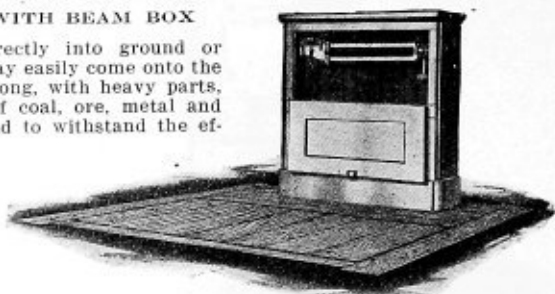


FIG. 4929

The double arrow-tip beam shown above is recommended for general use, but the scale may also be fitted with single or full capacity beam or Fairbanks Dial Indicator. The double beam is of brass, graduated 500x2 lbs. on both bars.

No. Code	Capacity	Platform Sizes	Platform to Beam Rod	List Double Beam
11343	4 T. x 2 lbs.	6 ft. 6 in. x 4 ft. 10 3/8 in.	1 ft. 6 1/4 in.	\$160.00
11344	4 T. x 2 lbs.	5 ft. x 4 ft.	1 ft. 3 in.	150.00
11198	6 T. x 2 lbs.	7 ft. 6 in. x 4 ft. 8 1/2 in.	1 ft. 5 1/2 in.	185.00
11199	10 T. x 2 lbs.	8 ft. 0 in. x 4 ft. 6 in.	1 ft. 4 3/8 in.	240.00

Note.—In the platform sizes above the first figure is the dimension parallel with the beam.

QUICK WEIGHING OUTFIT

This equipment is used on coal weighing scales at mine tipple, docks and terminals to give quickly the net weight in hopper or in coal car passing over the scale. As shown, it consists of a dial and counterpoise attached near the end of the beam and a dash-pot at the tip to prevent vibration. It is customary in coal districts to consider no less than 50 pounds in any weighing so that this dial is divided into alternate red and white blocks, each representing 50 pounds. Loose weights are used on the dial counterpoise to make up full capacity.

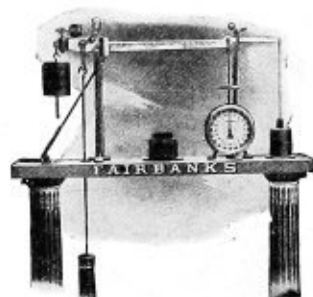


FIG. 4930

The tare weight of the hopper or car being taken upon the beam proper, each reading of the dial and counterpoise gives directly the net weight of the coal within the allowed range of fifty pounds. The loads can be weighed one right after the other, the dash-pot

absorbing the vibration of the levers and beam and thus steadying the dial indicator each time.

The outfit may be furnished complete for attaching to scale already in use or as part of new scale fitted and ready for service. May be used with either single or double beam.

Code	Capacity	Dial	Beam	List
10670	5 Ton	14 in.—5,000 x 50 lbs.	Double	\$200.00
10672	5 Ton	8 in.—2,000 x 50 lbs.	Double	160.00

FAIRBANKS WAGON, STOCK AND AUTO TRUCK SCALES



FIG. 4931

All scales listed below may be furnished for either wood or steel framing. For outdoor weighing, a substantial wood beam box is usually supplied, but for office use a short iron pillar outfit is preferable. The scale may be equipped with full capacity or type registering beam, though only on special order. All timber and foundations are to be furnished by purchaser. Weigh Books for wagon scale records, containing 500 tickets each, can be furnished upon order.

No.	Capacity Tons	Platform	Edge of Platform to Beam Rod	List Double Beam
2112	5	14 ft. x 8 ft.	2 ft. 2 1/2 in.	\$180.00
1932	6	16 ft. x 7 ft. 10 in.	1 ft. 11 in.	210.00
1928	10	14 ft. x 8 ft. 4 5/8 in.	2 ft. 3/4 in.	250.00
1928	10	16 ft. x 7 ft. 10 in.	1 ft. 11 in.	250.00
1924	15	14 ft. x 8 ft. 4 1/4 in.	2 ft. 1 in.	290.00
1824	15	18 ft. x 9 ft.	3 ft. 8 in.	300.00
10668	15	20 ft. x 9 ft.	2 ft. 11 in.	300.00
1802	15	22 ft. x 10 ft. 4 in.	2 ft. 1 in.	310.00

Note.—The 15-ton sizes listed above may be used for light auto truck weighing.

Note.—When scales are framed of wood, the lumber is furnished by the purchaser. When a steel frame is desired, the necessary steel work, punched and fitted, ready to assemble, is furnished by us at an extra charge. All foundations are supplied by purchaser.

FAIRBANKS FARM WAGON SCALE

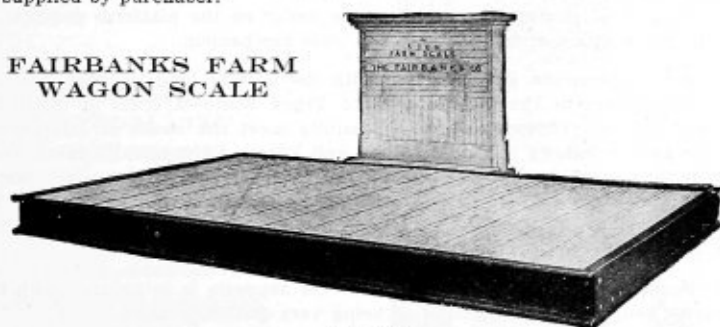


FIG. 4932

Self-contained. Full capacity beam. No loose weights. Capacity, five tons. Platform 14 in. x 8 in.

Price on application.

A high class scale at a medium price. Does not require an expensive pit or foundation. Easily moved.

This scale is shipped complete with steel frame, steel platform supports and beam box, so that the purchaser has only to supply the plank for the platform covering. It is so simple in design that it can be erected, ready for weighing—by any handy man in a few hours.

FAIRBANKS AUTO TRUCK SCALES

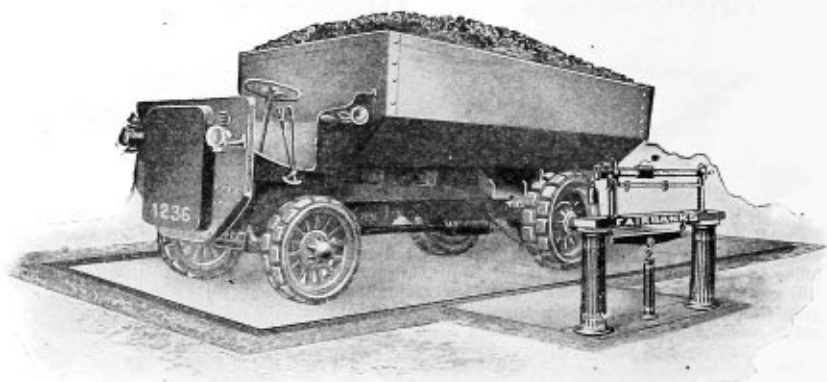


FIG. 4933

The extensive use of auto-trucks by dealers in coal, iron, building material, grain and other commodities, to increase the efficiency of their delivery service, has pointed out the need for scales of the required capacity and reliability to weigh these loads accurately. The conditions of this service are far more severe than those surrounding the ordinary wagon scale. It is well known that the majority of auto-trucks carry approximately eighty-five per cent of the total load on the rear axle. This load is thus concentrated upon one end of the scale. Furthermore, the shock of starting and stopping the motor on the platform produces an unusually heavy strain or impact upon the scale mechanism.

These considerations, in connection with the heavier loads carried, have led to the development of the Fairbanks Auto Truck Scale—a scale of distinctive design and highest refinements—to successfully meet the needs of this service. The lever system follows the style of the well known Fairbanks Railroad Track Scale, covering equally well every advantage of construction to produce lasting accuracy. The parts are of heavy section, precisely fitted and assembled. The pivots and bearings are of special hardened tool steel and of exceptional bearing length, to lessen wear.

The design of the pit, foundations and lever supports is in keeping with that of the scale proper, concrete and steel being very generally used.

Made regularly in five sizes.

10 ton	platform	16 ft. x 8 ft.
15 ton	platform	18 ft. x 9 ft.
15 ton	platform	20 ft. x 9 ft.
20 ton	platform	18 ft. x 9 ft.
20 ton	platform	20 ft. x 9 ft.

Prices on application.

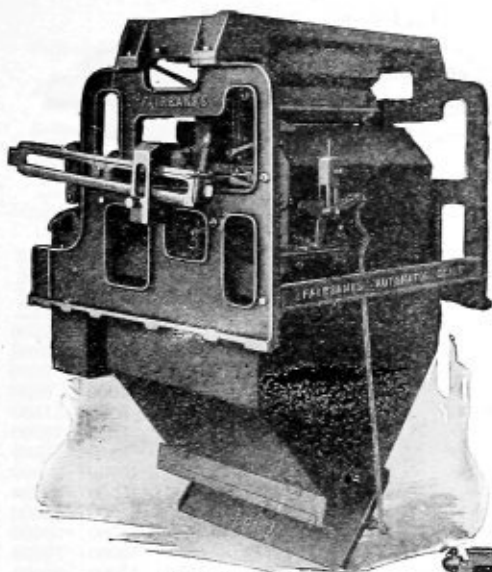


FIG. 4934

FAIRBANKS AUTOMATIC ELEVATOR SCALE

Single compartment made in sizes 750 to 2,000 bushels per hour. Also larger sizes made specially.

Prices on application. Special catalogue on request.

PORTABLE AUTOMATIC WEIGHER

For bagging and barreling purposes. Capacity 10 lbs. to 200 lbs. Special catalogue on request. Prices on application.

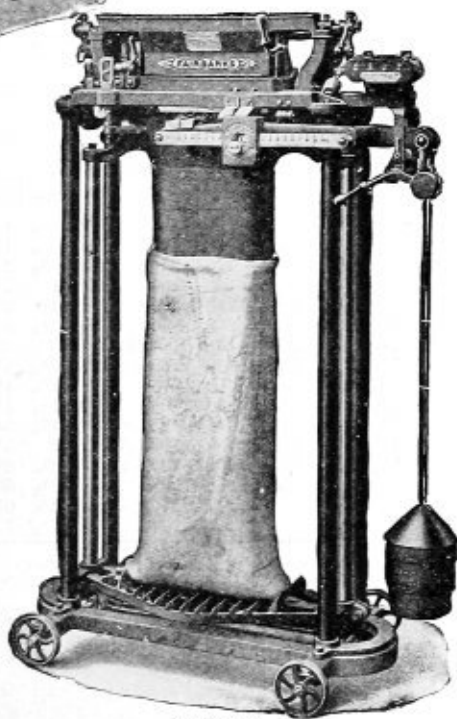


FIG. 4935

CHAIN



FIG. 4936

PROOF

BB

Size Inches	Approx. Links Per Foot	Outside Length Inches	Outside Width Inches	Weight Per 100 Ft. Pounds	Proof Test	Approx. Breaking Strain Pounds	Size Inches	Approx. Links Per Foot	Outside Length Inches	Outside Width Inches	Weight Per 100 Ft. Pounds	Proof Test	Approx. Breaking Strain Pounds
$\frac{3}{16}$	13 $\frac{1}{2}$	1 $\frac{3}{8}$	$\frac{7}{8}$	46	1000	2000	$\frac{3}{16}$	14 $\frac{1}{2}$	1 $\frac{1}{4}$	$\frac{3}{8}$	50	1100	2200
$\frac{1}{4}$	12 $\frac{1}{2}$	1 $\frac{1}{2}$	$\frac{7}{8}$	75	1500	3300	$\frac{1}{4}$	13 $\frac{1}{2}$	1 $\frac{1}{8}$	$\frac{13}{16}$	80	1650	3800
$\frac{5}{16}$	11	1 $\frac{1}{4}$	1 $\frac{1}{4}$	110	2600	5200	$\frac{5}{16}$	12	1 $\frac{1}{8}$	1 $\frac{1}{8}$	115	3000	5600
$\frac{3}{8}$	10	1 $\frac{1}{4}$	1 $\frac{1}{2}$	155	3600	7200	$\frac{3}{8}$	11	1 $\frac{1}{8}$	1 $\frac{1}{8}$	160	4000	8000
$\frac{7}{16}$	9	1 $\frac{1}{4}$	1 $\frac{1}{2}$	200	4500	10000	$\frac{7}{16}$	9 $\frac{1}{2}$	1 $\frac{1}{8}$	1 $\frac{1}{8}$	210	5500	11500
$\frac{1}{2}$	8	1 $\frac{1}{4}$	1 $\frac{1}{2}$	260	6500	13000	$\frac{1}{2}$	8 $\frac{1}{2}$	1 $\frac{1}{8}$	1 $\frac{1}{4}$	265	7000	15000
$\frac{5}{8}$	7 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	325	8000	16000	$\frac{5}{8}$	7	1 $\frac{1}{8}$	1 $\frac{1}{2}$	335	8800	18500
$\frac{3}{4}$	6 $\frac{1}{2}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	400	9500	20000	$\frac{3}{4}$	6 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	410	10750	23000
$\frac{7}{8}$	6	1 $\frac{3}{4}$	1 $\frac{3}{4}$	590	13500	28800	$\frac{7}{8}$	6 $\frac{1}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	600	15500	33500
1	4	1 $\frac{3}{4}$	1 $\frac{3}{4}$	800	18500	39000	1	5 $\frac{1}{2}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	820	21000	44000
1 $\frac{1}{8}$	3 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1000	24000	51500	1 $\frac{1}{8}$	4 $\frac{1}{2}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1030	28500	59000
1 $\frac{1}{4}$	3 $\frac{3}{8}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1300	29000	60000	1 $\frac{1}{4}$	4	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1350	36000	74000
	3 $\frac{3}{8}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1500	39000	80000	1 $\frac{1}{4}$	3 $\frac{1}{2}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1550	43000	86000

BBB

H B DREDGE

Size Inches	Approx. Links Per Foot	Outside Length Inches	Outside Width Inches	Weight Per 100 Ft. Pounds	Proof Test	Approx. Breaking Strain Pounds	Size Inches	Standard Pitch	Outside Length Inches	Outside Width Inches	Proof Test	Approx. Breaking Strain Pounds	Average Safe Work- ing Load Pounds
$\frac{3}{16}$	15	1 $\frac{1}{8}$	$\frac{3}{4}$	52	1200	2400	$\frac{5}{8}$	1 $\frac{1}{8}$	3	2 $\frac{1}{2}$	12000	25000	7200
$\frac{1}{4}$	14	1 $\frac{1}{8}$	$\frac{13}{16}$	83	1750	4500	$\frac{3}{4}$	1 $\frac{1}{8}$	3 $\frac{1}{2}$	2 $\frac{1}{2}$	18000	36000	10800
$\frac{5}{16}$	12 $\frac{1}{2}$	1 $\frac{1}{8}$	1 $\frac{1}{8}$	118	3400	7000	1	2 $\frac{1}{8}$	4	2 $\frac{1}{2}$	24500	48000	14700
$\frac{3}{8}$	11 $\frac{1}{2}$	1 $\frac{1}{8}$	1 $\frac{1}{8}$	166	4500	9000	1 $\frac{1}{8}$	2 $\frac{1}{2}$	4 $\frac{1}{2}$	3 $\frac{1}{4}$	32000	61000	19200
$\frac{7}{16}$	10	1 $\frac{1}{8}$	1 $\frac{1}{8}$	235	6300	12500	1 $\frac{1}{4}$	2 $\frac{1}{4}$	5 $\frac{1}{2}$	3 $\frac{3}{4}$	40000	78000	24000
$\frac{1}{2}$	9	1 $\frac{1}{8}$	1 $\frac{1}{4}$	268	8000	16500	1 $\frac{1}{2}$	3 $\frac{1}{8}$	5 $\frac{3}{4}$	4 $\frac{1}{2}$	49000	95000	29400
$\frac{5}{8}$	8 $\frac{1}{4}$	1 $\frac{1}{4}$	1 $\frac{1}{4}$	340	10000	22000	1 $\frac{3}{8}$	3 $\frac{1}{4}$	6 $\frac{1}{2}$	4 $\frac{1}{2}$	58000	114000	34800
$\frac{3}{4}$	7 $\frac{1}{4}$	1 $\frac{1}{4}$	1 $\frac{1}{4}$	420	12500	25000	1 $\frac{1}{2}$	3 $\frac{1}{2}$	7	5	67000	134000	40200
$\frac{7}{8}$	6 $\frac{1}{2}$	1 $\frac{1}{4}$	1 $\frac{1}{4}$	610	17750	35000	1 $\frac{3}{4}$	4 $\frac{1}{4}$	7 $\frac{1}{4}$	5 $\frac{1}{2}$	77000	154000	46200
1	5 $\frac{1}{2}$	1 $\frac{1}{4}$	1 $\frac{1}{4}$	830	24000	47500	1 $\frac{3}{4}$	4 $\frac{1}{4}$	8 $\frac{1}{2}$	5 $\frac{1}{2}$	83000	166000	49800
1 $\frac{1}{8}$	4 $\frac{1}{2}$	1 $\frac{1}{4}$	1 $\frac{1}{4}$	1040	31350	64500	1 $\frac{3}{8}$	5 $\frac{1}{4}$	9 $\frac{1}{4}$	6 $\frac{1}{2}$	95000	190000	57000
1 $\frac{1}{4}$	4 $\frac{1}{8}$	1 $\frac{1}{4}$	1 $\frac{1}{4}$	1400	38000	78000	2	5 $\frac{1}{4}$	10	6 $\frac{1}{2}$	108000	216000	64800
	3 $\frac{5}{8}$	1 $\frac{1}{4}$	1 $\frac{1}{4}$	1600	47000	95000	2 $\frac{1}{4}$	6 $\frac{1}{4}$	10 $\frac{3}{4}$	7 $\frac{1}{2}$	122000	244000	73200
	...	...	...	...	...	...	2 $\frac{1}{4}$	6 $\frac{1}{4}$	11 $\frac{1}{2}$	7 $\frac{1}{2}$	136500	273000	81900
	...	...	...	...	...	...	2 $\frac{3}{8}$	6 $\frac{3}{8}$	11 $\frac{3}{4}$	8	152000	304000	91200
	...	...	...	...	...	...	2 $\frac{1}{2}$	7	12 $\frac{1}{4}$	8 $\frac{1}{2}$	168500	337000	102100

PROOF COIL CHAIN EXTRAS

Following show extras on sizes lighter than 1" to be added to the base price,—1" (one inch) being base size.

3/16"	1/4"	5/16"	3/8"	7/16"	9/16" 1 1/2"	1 1/16" 5/8"	1 3/16" 3/4"	1 5/16" 7/8"	1"	1 1/8" 1 1/4"
6.50	\$1.00	\$2.00	\$1.00	\$8.00	8.65	8.45	8.20	8.10	Base	Base

Following shows individual price for each size Proof Coil Chain with above differential added to base (1") when base price fluctuates between 4 cents and 9 cents per pound for base size—Base size being printed in heavy type.

3/16"	1/4"	5/16"	3/8"	7/16"	9/16" 1 1/2"	1 1/16" 5/8"	1 3/16" 3/4"	1 5/16" 7/8"	BASE 1"	1 1/8" 1 1/4"
810.50	8.00	6.00	5.00	1.80	1.65	4.15	4.20	4.10	4.00	4.00
10.60	8.10	6.10	5.10	4.90	4.75	4.55	4.30	4.20	4.10	4.10
10.70	8.20	6.20	5.20	5.00	4.85	4.65	4.40	4.30	4.20	4.20
10.80	8.30	6.30	5.30	5.10	4.95	4.75	4.50	4.40	4.30	4.30
10.90	8.40	6.40	5.40	5.20	5.05	4.85	4.60	4.50	4.40	4.40
11.00	8.50	6.50	5.50	5.30	5.15	4.95	4.70	4.60	4.50	4.50
11.10	8.60	6.60	5.60	5.40	5.25	5.05	4.80	4.70	4.60	4.60
11.20	8.70	6.70	5.70	5.50	5.35	5.15	4.90	4.80	4.70	4.70
11.30	8.80	6.80	5.80	5.60	5.45	5.25	5.00	4.90	4.80	4.80
11.40	8.90	6.90	5.90	5.70	5.55	5.35	5.10	5.00	4.90	4.90
11.50	9.00	7.00	6.00	5.80	5.65	5.45	5.20	5.10	5.00	5.00
11.60	9.10	7.10	6.10	5.90	5.75	5.55	5.30	5.20	5.10	5.10
11.70	9.20	7.20	6.20	6.00	5.85	5.65	5.40	5.30	5.20	5.20
11.80	9.30	7.30	6.30	6.10	5.95	5.75	5.50	5.40	5.30	5.30
11.90	9.40	7.40	6.40	6.20	6.05	5.85	5.60	5.50	5.40	5.40
12.00	9.50	7.50	6.50	6.30	6.15	5.95	5.70	5.60	5.50	5.50
12.10	9.60	7.60	6.60	6.40	6.25	6.05	5.80	5.70	5.60	5.60
12.20	9.70	7.70	6.70	6.50	6.35	6.15	5.90	5.80	5.70	5.70
12.30	9.80	7.80	6.80	6.60	6.45	6.25	6.00	5.90	5.80	5.80
12.40	9.90	7.90	6.90	6.70	6.55	6.35	6.10	6.00	5.90	5.90
12.50	10.00	8.00	7.00	6.80	6.65	6.45	6.20	6.10	6.00	6.00
12.60	10.10	8.10	7.10	6.90	6.75	6.55	6.30	6.20	6.10	6.10
12.70	10.20	8.20	7.20	7.00	6.85	6.65	6.40	6.30	6.20	6.20
12.80	10.30	8.30	7.30	7.10	6.95	6.75	6.50	6.40	6.30	6.30
12.90	10.40	8.40	7.40	7.20	7.05	6.85	6.60	6.50	6.40	6.40
13.00	10.50	8.50	7.50	7.30	7.15	6.95	6.70	6.60	6.50	6.50
13.10	10.60	8.60	7.60	7.40	7.25	7.05	6.80	6.70	6.60	6.60
13.20	10.70	8.70	7.70	7.50	7.35	7.15	6.90	6.80	6.70	6.70
13.30	10.80	8.80	7.80	7.60	7.45	7.25	7.00	6.90	6.80	6.80
13.40	10.90	8.90	7.90	7.70	7.55	7.35	7.10	7.00	6.90	6.90
13.50	11.00	9.00	8.00	7.80	7.65	7.45	7.20	7.10	7.00	7.00
13.60	11.10	9.10	8.10	7.90	7.75	7.55	7.30	7.20	7.10	7.10
13.70	11.20	9.20	8.20	8.00	7.85	7.65	7.40	7.30	7.20	7.20
13.80	11.30	9.30	8.30	8.10	7.95	7.75	7.50	7.40	7.30	7.30
13.90	11.40	9.40	8.40	8.20	8.05	7.85	7.60	7.50	7.40	7.40
14.00	11.50	9.50	8.50	8.30	8.15	7.95	7.70	7.60	7.50	7.50
14.10	11.60	9.60	8.60	8.40	8.25	8.05	7.80	7.70	7.60	7.60
14.20	11.70	9.70	8.70	8.50	8.35	8.15	7.90	7.80	7.70	7.70
14.30	11.80	9.80	8.80	8.60	8.45	8.25	8.00	7.90	7.80	7.80
14.40	11.90	9.90	8.90	8.70	8.55	8.35	8.10	8.00	7.90	7.90
14.50	12.00	10.00	9.00	8.80	8.65	8.45	8.20	8.10	8.00	8.00
14.60	12.10	10.10	9.10	8.90	8.75	8.55	8.30	8.20	8.10	8.10
14.70	12.20	10.20	9.20	9.00	8.85	8.65	8.40	8.30	8.20	8.20
14.80	12.30	10.30	9.30	9.10	8.95	8.75	8.50	8.40	8.30	8.30
14.90	12.40	10.40	9.40	9.20	9.05	8.85	8.60	8.50	8.40	8.40
15.00	12.50	10.50	9.50	9.30	9.15	8.95	8.70	8.60	8.50	8.50
15.10	12.60	10.60	9.60	9.40	9.25	9.05	8.80	8.70	8.60	8.60
15.20	12.70	10.70	9.70	9.50	9.35	9.15	8.90	8.80	8.70	8.70
15.30	12.80	10.80	9.80	9.60	9.45	9.25	9.00	8.90	8.80	8.80
15.40	12.90	10.90	9.90	9.70	9.55	9.35	9.10	9.00	8.90	8.90
15.50	13.00	11.00	10.00	9.80	9.65	9.45	9.20	9.10	9.00	9.00

POUND CHAIN EXTRAS

Classified List of Extras to Be Added to Proof Coil Chain

TWIST LINK

 $\frac{3}{16}$ " to $\frac{1}{16}$ " inclusive.....\$1.00 per 100 lbs. advance

BRIGHT COIL CHAIN

50c per 100 lbs. advance.

COIL CHAIN IN EXACT SIZES

 $\frac{3}{16}$ "\$2.00 per 100 lbs. advance $\frac{1}{4}$ " 1.00 per 100 lbs. advance $\frac{1}{8}$ " and larger in exact sizes take special price.

BB AND BBB

BB quality $\frac{3}{16}$ " and $\frac{1}{4}$ "\$2.00 per 100 lbs. advance over Proof QualityBB quality $\frac{5}{16}$ " and $\frac{3}{8}$ " 1.50 per 100 lbs. advance over Proof QualityBB quality $\frac{1}{2}$ " and larger 1.25 per 100 lbs. advance over Proof QualityBBB quality $\frac{3}{16}$ " and $\frac{1}{4}$ " 4.00 per 100 lbs. advance over Proof QualityBBB quality $\frac{5}{16}$ " and $\frac{3}{8}$ " 2.50 per 100 lbs. advance over Proof QualityBBB quality $\frac{1}{2}$ " and larger 2.25 per 100 lbs. advance over Proof Quality

IRON CHAIN

For Iron Chain, add as follows to price of Regular Coil:

$\frac{3}{8}$ "	$\frac{7}{8}$ "	$\frac{1}{2}$ " $\frac{1}{16}$ "	$\frac{5}{8}$ "	$\frac{3}{4}$ "	$\frac{7}{8}$ "	1"	1 $\frac{1}{8}$ " 1 $\frac{1}{4}$ "	
\$1.85	\$1.80	\$1.75	\$1.70	\$1.65	\$1.65	\$1.60	\$1.60	per 100 lbs.

GALVANIZING

Add to price of Self-colored Chain:

$\frac{3}{16}$ "	$\frac{1}{4}$ "	$\frac{5}{16}$ "	$\frac{3}{8}$ "	$\frac{7}{16}$ "	$\frac{1}{2}$ "	$\frac{5}{8}$ "	$\frac{3}{4}$ " and larger.	
\$2.50	\$2.40	\$2.30	\$2.20	\$2.15	\$2.00	\$1.90	\$1.80	per 100 lbs.

CONVEYOR CHAIN

Proof Quality\$1.00 per 100 pounds advance over Proof Coil

BB Quality 1.50 per 100 pounds advance over Proof Coil

BBB Quality 2.00 per 100 pounds advance over Proof Coil

LOG CHAIN

Self-colored\$1.25 per 100 lbs. advance over Proof Coil.

Bright 1.75 per 100 lbs. advance over Self-colored Proof Coil

MACHINE CHAIN



FIG. 4937

No.	American Gage	Weight Per 100 Ft.	List Price Per 100 Ft.
6-0	$\frac{3}{8}$	81	\$21.00
5-0	$\frac{1}{2}$	64	18.00
4-0	$\frac{5}{8}$	50	15.00
3-0	5	40	14.00
2-0	6	34	13.00
0	7	28	12.50
1	8	23	12.00
2	9	20	11.50
3	10	15	11.00

SASH CHAIN



FIG. 4938

No.	For Sash, Lbs.	Polished, Per 100 Ft.	Copper, Plated or Galv., 100 Ft.
250	180	\$6.50	\$7.25
130	130	4.20	4.95
80	80	3.60	4.35

PLUMBERS' CHAINS—HARD BRASS



FIG. 4939

SAFETY LINKS
PER BOX OF TWELVE YARDS

No.	Brass	Nickel or Silvered	No.	Brass	Nickel or Silvered
9 $\frac{1}{2}$	\$1.15	5c per	2	\$2.30	10c per
91	1.25	Box	3	3.15	Box
8	1.50	Net	4	3.65	Net
8 Spec.	1.85	Extra	.....	.....	Extra

GERMAN BRIGHT COIL CHAIN



FIG. 4940

Size	Weight per 100 Feet	Price per 100 Feet	Size	Weight per 100 Feet	Price per 100 Feet
5	7	\$6.50	1	19 $\frac{1}{2}$	\$7.80
4	8 $\frac{3}{4}$	6.60	0	24	8.80
3	10 $\frac{1}{2}$	6.80	00	29	10.00
2	15	7.20	000	33	11.00

BROWN COIL CHAIN



FIG. 4941

Size	Weight Per 100 Feet	Price Per 100 Feet	Size	Weight Per 100 Feet	Price Per 100 Feet
4	5	\$2.75	0	12	\$4.00
3	6 $\frac{1}{2}$	2.90	00	16 $\frac{1}{2}$	4.50
2	8	3.10	000	19 $\frac{1}{2}$	5.25
1	9 $\frac{3}{4}$	3.50	.....	.....	.....

THE "KEYSTONE" CONNECTING LINK



FIG. 4942

The "Keystone" Connecting Link for connecting new or repairing broken chains of all kinds—is composed of two corresponding halves centrally pivoted on the same axis. As shown by the illustration herewith, the inner flat face of each member is pivoted with a projecting lug and recess, so that when closed and in use they mutually interlock, and by abutting against each other, lateral displacement of the two halves, and their consequent spreading or parting—is rendered impossible. The "Keystone" Link is drop forged from an especially tough grade of bar steel, is the only one so made, and must not be confused with similar devices which are simply malleable iron casting.

Size, inches	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$
Per dozen...	\$2.00	2.25	2.50	3.25	4.00	7.50	10.00	12.50	15.00	17.50	20.00

DROP FORGED CONNECTING LINKS

THE "MISSING LINK"



FIG. 4943

Size	inch	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{5}{8}$
Plain	per doz.	\$1.00	1.10	1.20	1.35	1.50	1.80	2.00
Galvanized	per doz.	1.35	1.45	1.60	1.80	2.10	2.55	3.00

Size	inch	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$
Plain	per doz.	\$2.65	3.35	5.00	7.00	16.00	21.50	29.40	36.00
Galvanized	per doz.	3.75	4.50	6.50	9.00	19.00	25.00	34.00	42.25



FIG. 4944

LAP LINK—SIDE OPEN

Size. in.	$\frac{1}{16} \times 2\frac{1}{4}$	$\frac{1}{8} \times 2\frac{1}{2}$	$\frac{3}{16} \times 2\frac{1}{2}$	$\frac{1}{4} \times 2\frac{1}{2}$	$\frac{5}{16} \times 3$
Per gross.....					

COLD SHUTS

Prices Per 100 Pieces



FIG. 4945

No. 615.	For $\frac{1}{4}$ inch chain.....	\$2.70
No. 616.	For $\frac{5}{16}$ inch chain.....	3.20
No. 617.	For $\frac{3}{8}$ inch chain.....	4.10
No. 618.	For $\frac{7}{16}$ inch chain.....	5.30
No. 619.	For $\frac{1}{2}$ inch chain.....	7.10
No. 620.	For $\frac{5}{8}$ inch chain.....	12.10
No. 621.	For $\frac{3}{4}$ inch chain.....	24.30
No. 622.	For $\frac{7}{8}$ inch chain.....	44.00
No. 623.	For 1 inch chain.....	64.00

Grab



FIG. 4946

GRAB AND ROUND HOOKS

PRICE PER 100 PIECES

For chain.....inch	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
Grab.....per 100	\$9.70	12.50	17.60	23.00
Round.....per 100	9.70	12.50	17.60	23.00

For chain.....inch	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$1\frac{1}{4}$
Grab.....per 100	\$31.30	59.00	90.00	.....
Round.....per 100	31.30	59.00	90.00	.....

Round



FIG. 4947



FIG. 4948

CHAIN RAFTING DOGS

No. 642. Five links of chain, size of dog
 $1\frac{1}{8} \times \frac{3}{8}$ -inch.

Price.....per 100, \$25.00



FIG. 4949

RING DOGS

No. 643. $\frac{3}{4}$ -inch square iron, with 2-inch rings
 Per 100.....\$18.00

No. 644. $\frac{1}{2}$ -inch square iron, with 2 $\frac{1}{2}$ -in. rings
 Per 100.....\$21.00

No. 645. 1-inch square iron, with 3-inch rings
 Per 100.....\$24.00

CHAIN SHACKLES

Screw
Shackle

FIG. 4950

Size, Inches	List Price Per Doz.	Length Inside, Inches	Width Between Eyes	Estimate Weight Each, Lbs.	Maximum Strength, Lbs.
$\frac{3}{8}$	\$3.00	$1\frac{7}{32}$	$\frac{5}{8}$	$\frac{1}{4}$	9,480
$\frac{1}{2}$	4.00	$1\frac{13}{16}$	$1\frac{1}{4}$	$\frac{3}{4}$	11,400
$\frac{5}{8}$	5.00	2	2	$1\frac{1}{4}$	33,400
$\frac{3}{4}$	5.50	$2\frac{1}{16}$	$1\frac{13}{32}$	1	43,400
$\frac{7}{8}$	7.25	$2\frac{5}{8}$	$1\frac{1}{2}$	$3\frac{3}{4}$	55,200
1	10.00	$3\frac{1}{4}$	$1\frac{3}{4}$	$4\frac{1}{2}$	74,900
$1\frac{1}{8}$	16.00	$3\frac{11}{16}$	$1\frac{7}{8}$	7	90,200
$1\frac{1}{4}$	25.00	4	2	$8\frac{3}{4}$	92,040

Round Pin
Shackle

FIG. 4951

Sizes $1\frac{3}{8}$ to 2-inch, price 16 cents per pound. The pin is always one size larger than the shackle. We recommend $\frac{1}{4}$, or better still $\frac{1}{2}$ of above test as a safe working load.

MALLEABLE CHAIN SWIVELS



FIG. 4952

No.....	7710A	7710B	7715A	7715H	7715D	7715E	7715G
Length.....inches	$2\frac{3}{8}$	$2\frac{1}{2}$	3	$3\frac{3}{4}$	$4\frac{3}{4}$	5	$7\frac{1}{4}$
Diameter iron....."	$\frac{1}{4}$	$\frac{5}{32}$	$\frac{5}{16}$	$\frac{5}{16}$	$\frac{7}{16}$	$\frac{9}{16}$	$\frac{3}{4}$
" Eye....."	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1
Lbs.....per dozen	$1\frac{1}{2}$	$1\frac{1}{4}$	3	$5\frac{1}{2}$	9	$10\frac{1}{2}$	$32\frac{1}{4}$
List....."	\$.....	.....	.....	.....	.....	.....	.....

STANDARD DETACHABLE CHAIN BELT

PRICE LIST IN EFFECT DEC. 1, 1915



FIG. 4953

LIST PRICES—WORKING STRENGTH-SPEEDS

Chain No.	WORKING STRENGTHS†—FOR SPEED IN FEET PER MINUTE									
	Plain Chain per foot	Couplers per ft.	Ap-prox. Links in 10 feet	Ap-prox. Wt. per foot	150 ft.	200 ft.	300 ft.	400 ft.	500 ft.	600 ft. 700 ft.
*25	\$0.15	\$0.15	133	.223	120	114	102	90	78	66 54
*32	.15	.18	104	.343	185	176	157	139	120	102 83
33	.15	.17	86	.322	200	190	170	150	130	110 90
34	.15	.17	86	.402	215	204	183	161	140	118 97
35	.15	.20	74	.402	200	190	170	150	130	110 90
*42	.17	.21	88	.52	250	238	213	188	163	138 113
45†	.15	.20	74	.51	265	252	225	199	172	146 119
51	.21	.20	104	.763	315	299	268	237	205	173 142
*52	.20	.18	80	.85	385	366	327	289	250	212 173
*55†	.18	.18	74	.69	370	352	315	278	241	204 167
57†	.20	.21	52	.89	470	447	400	353	306	259 212
*62	.25	.25	73	1.07	515	489	438	386	335	283 232
66	.26	.25	60	1.22	435	413	370	326	283	239
67†	.26	.25	52	1.23	555	527	472	416	361	305
75	.27	.21	46	1.40	670	637	570	503	436	369
*77†	.25	.25	52	1.45	600	570	510	450	390	330
*78†	.38	.28	46	2.00	815	774	693	611	530	448
83	.39	.36	30	1.95	825	784	701	619	536	
85†	.49	.49	30	2.52	1265	1202	1075	949	822	
*88†	.48	.31	46	2.37	960	912	816	720	624	528
93	.54	.49	30	....	1250	1188	1063	938	813	
95	.59	.60	30	3.03	1450	1378	1233	1088	943	Heavy Lines
*103†	.74	.64	39	4.08	1600	1520	1360	1200	1040	Indicate Speed Limits.
†104½	1.02	1.03	26	4.75	1915	1819	1628	1436		
108†	.70	.87	25½	3.45	1650	1568	1403	1238		
110	.82	1.02	25½	....	2115	2009	1798	1586		
*114	.94	.93	37	5.37	1835	1743	1560	1376	1193	Economical
122	1.25	1.74	20	6.87	2500	2375	2125			Speeds not
*124	1.14	1.31	30	6.49	2115	2009	1798	1586		over half of these
146	1.13	1.42	20	....	2335	2218	1985			Speed Limits.

Bold Face Type, indicates Usual Sizes Carried in Stock to cover all reasonable demands; all others subject to occasional delays.

*Popular Sizes for Transmitting Power, used also for Conveyers.

†Popular Sizes for Elevators and Conveyers, used also for Drives.

‡Rough Service and Shocks use but half of "Working Strengths" in table at speed required. Note "Economical Speeds."

DETACHABLE CHAIN BELTING



FIG. 4954

NO. 25

FULL
SIZE:
WORK-
ING
STRAIN,
75 LBS.



FIG. 4955

NO. 32

FULL
SIZE:
WORK-
ING
STRAIN,
150 LBS.



FIG. 4956

NO. 33

FULL
SIZE:
WORK-
ING
STRAIN,
200 LBS.



FIG. 4957

NO. 34

FULL
SIZE:
WORK-
ING
STRAIN,
225 LBS.

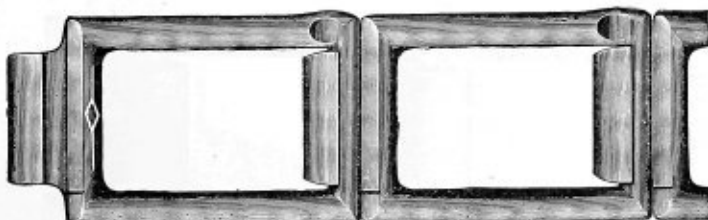


FIG. 4958

NO. 35

FULL
SIZE:
WORK-
ING
STRAIN,
250 LBS.

DETACHABLE LINK-BELTING

NO. 42

FULL SIZE: WORKING STRAIN 300 LBS.

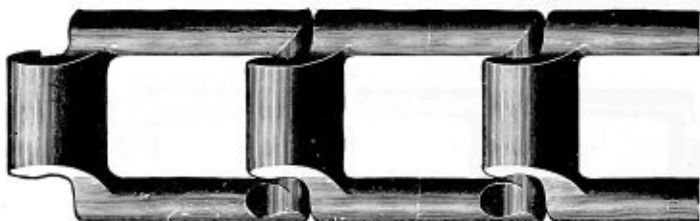


FIG. 4959

NO. 45

FULL SIZE: WORKING STRAIN 350 LBS.

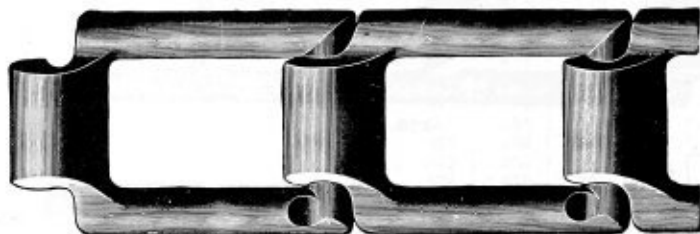


FIG. 4960

NO. 55

FULL SIZE: WORKING STRAIN 450 LBS.

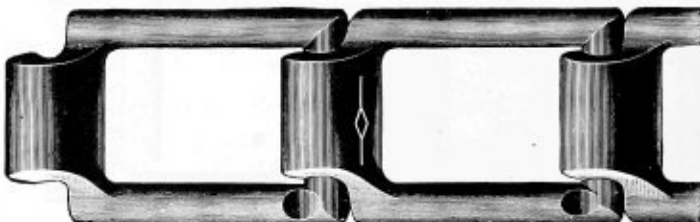


FIG. 4961

DETACHABLE LINK-BELTING
NO. 67. FULL SIZE: WORKING STRAIN 700 LBS.

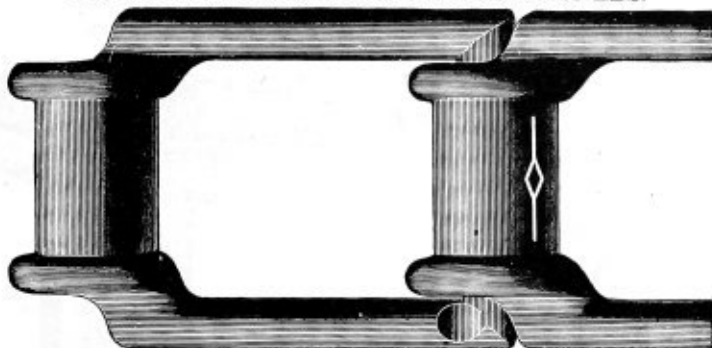


FIG. 4962

NO. 75. FULL SIZE: WORKING STRAIN 750 LBS.

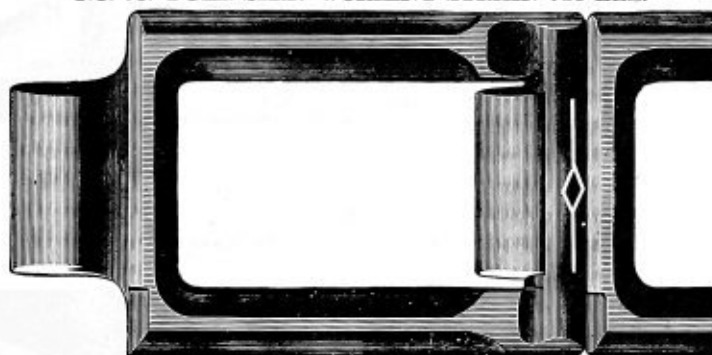


FIG. 4963

NO. 77. FULL SIZE: WORKING STRAIN 800 LBS.

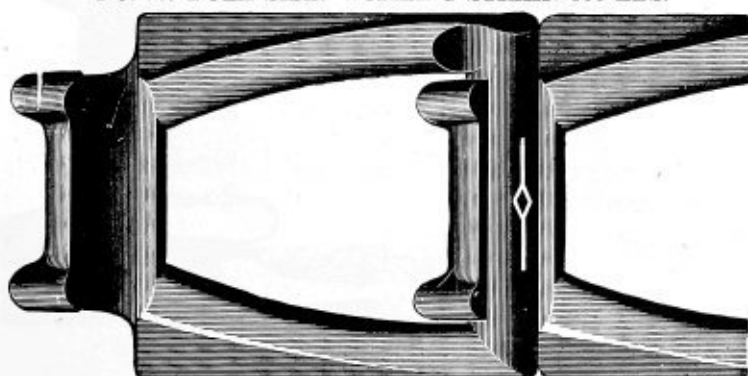


FIG. 4964

DETACHABLE CHAIN BELTING

NO. 78

FULL SIZE: WORKING STRAIN 1,000 POUNDS

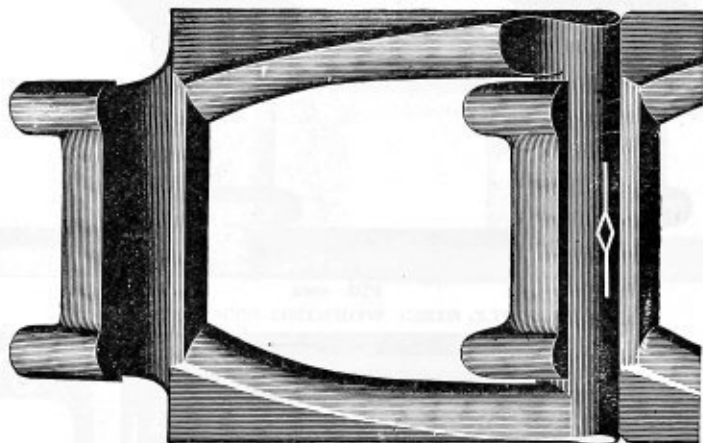


FIG. 4965

NO. 88

FULL SIZE: WORKING STRAIN 1,200 POUNDS

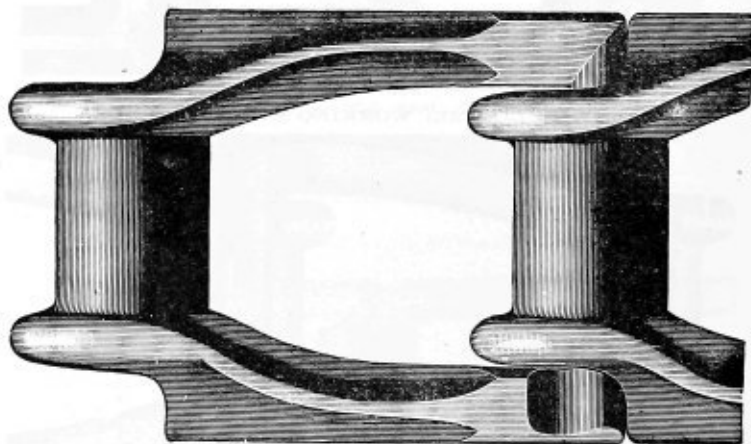


FIG. 4966

DETACHABLE CHAIN BELTING

NO. 103

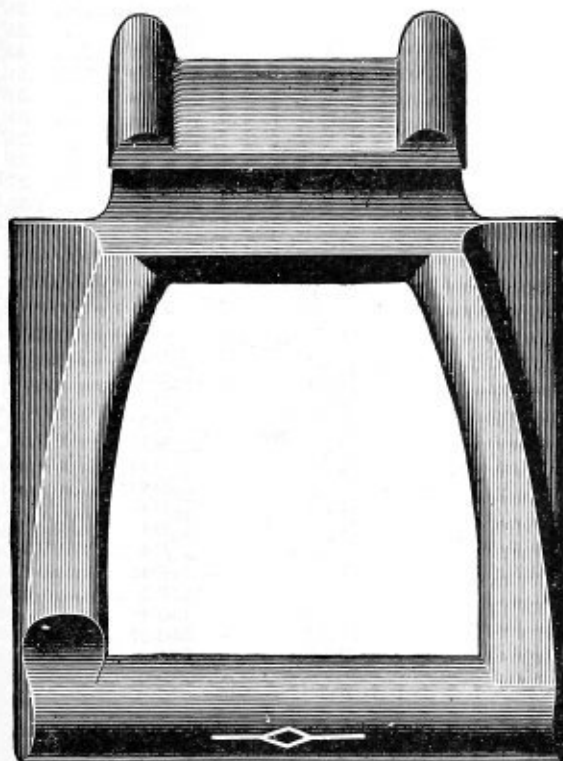


FIG. 4967

FULL SIZE: WORKING STRAIN 1,800 LBS.

DETACHABLE LINK BELTING ATTACHMENT LINKS

PRICE LIST—PER FOOT

For illustrations see pages following this list.

No. 7	No. 32	No. 34—Cont'd	No. 44—Cont'd	No. 45—Cont'd
C \$0.49	A-1 \$0.30	K-37 \$0.60	K-5 \$0.38	K-48 \$0.42
No. 22	A-2 ..... .31	8 1/2" Eleva-	K-6 ..... .48	L-2 ..... .28
R-39 ..... .40	A-3 ..... .27	tor Bar, ea.	No. 45	L-3 ..... .30
No. 23	A-12 ..... .33	No. 35	A-1 ..... .25	M-1 ..... .31
H-2 ..... .43	C-1 ..... .40	A-1 ..... .29	A-2 ..... .31	P-2 ..... .49
No. 024	C-5 ..... .47	A-2 ..... .40	A-3 ..... .35	S-1 ..... .29
C-1 ..... .33	D-3 ..... .33	A-13 ..... .33	A-10 ..... .25	S-5 ..... .30
No. 025	D-46 ..... .20	A-29 ..... .33	A-11 ..... .40	S-6 ..... .30
A-3 ..... .40	E-1 ..... .27	C-1 ..... .40	A-12 ..... .31	Tube, each. .07
No. 25	G-1 ..... .31	E-1 ..... .40	A-13 ..... .31	No. 1 Scrap-
A-1 ..... .27	I-3 ..... .37	K-1 ..... .40	A-14 ..... .39	er, each. .10
A-3 ..... .28	K-1 ..... .37	K-5 ..... .37	A-29 ..... .28	Strap ..... .27
A-39 ..... .25	K-3 ..... .48	S-1 ..... .33	A-37-LA ..... .39	No. 47
C-1 1/2 ..... .27	K-5 ..... .29	No. 1 Scrap-	A-109 ..... .27	L-2 ..... .31
C-1/2 ..... .29	K-6 ..... .47	er, each. .10	A-110 ..... .39	L-3 ..... .30
C-1/2 ..... .29	K-36 ..... .40	No. 37	C-1 ..... .33	L-4 ..... .46
C-1 ..... .36	L-1 ..... .33	K-5 ..... .33	C-15 ..... .42	No. 43
C-26 ..... .53	M-1 ..... .40	L-3 ..... .31	C-20 ..... .47	A-3 ..... .33
D-3 ..... .32	U ..... .24	No. 39, 4-Bar	C-22 ..... .64	B-1 ..... .70
D-28 ..... .21	No. 33	L-3 ..... .55	C-27 ..... .52	C-29 ..... .63
E-1 ..... .27	A-1 ..... .21	No. 042	C-28 ..... .71	K-1 ..... .48
E-3 ..... .44	A-6 ..... .28	A-1 ..... .36	D-1 ..... .42	No. 50
E-16 ..... .35	A-29 ..... .32	E-1 ..... .33	D-3 ..... .40	A-1 ..... .30
G-1 ..... .35	C-1 ..... .32	L-2 ..... .35	D-5 ..... .40	A-61 ..... .40
H-16 ..... .51	D-3 ..... .48	No. 42	D-6 ..... .60	AJ ..... .53
I-3 ..... .42	D-5 ..... .25	A-1 ..... .29	D-17 ..... .31	K-3 1/2 ..... .82
K-1 ..... .32	D-16 ..... .58	A-3 ..... .43	D-42 ..... .37	No. 51
K-5 ..... .29	E-1 ..... .22	A-6 ..... .29	D-43 ..... .28	A-1 ..... .31
K-6 ..... .36	I-3 ..... .41	A-14 ..... .46	D-45 ..... .27	C-1 ..... .42
M-1 ..... .33	K-1 ..... .31	A-29 ..... .33	E-1 ..... .22	C-14 ..... .64
O-1 ..... .29	K-3 ..... .48	A-109 ..... .47	E-4 ..... .18	D-4 ..... .84
O-2 ..... .33	K-5 ..... .31	C-1 ..... .39	E-12 ..... .33	D-5 ..... .53
R-4 ..... .36	K-6 ..... .43	E-1 ..... .27	F-2 ..... .29	I-5 ..... .52
R-16 ..... .40	K-11 ..... .51	G-27 ..... .49	G-1 ..... .40	I-6 ..... .40
R-26 ..... .25	K-12 ..... .39	K-1 ..... .36	G-27 ..... .43	K-1 ..... .40
R-27 ..... .30	L-2 ..... .31	K-3 ..... .50	H-2 ..... .37	K-5 ..... .41
R-28 ..... .38	M-1 ..... .36	K-3 1/2 ..... .93	I-3 ..... .37	K-7 ..... .53
R-29 ..... .30	S-1 ..... .31	K-5 ..... .32	I-12 ..... .35	S-1 ..... .35
R-72 ..... .33	8 1/2" Eleva-	K-6 ..... .50	I-15 ..... .35	No. 52
R-80 ..... .31	tor Bar, ea.	S-1 ..... .33	I-16 ..... .31	A-1 ..... .35
R-82 ..... .43	9 1/2" Eleva-	No. 6 Scrap-	K-1 ..... .32	A-3 ..... .42
R-83 ..... .36	tor Bar, ea.	er, each. .18	K-1 Coupler,	A-14 ..... .72
S-1 ..... .33	No. 20 Scrap-	er, each. .10	pair ..... .39	C-1 ..... .41
U ..... .25	No. 34	No. 43, 3-Bar	K-5 ..... .31	D-3 ..... .48
No. 027	A-1 ..... .27	K-3 ..... .66	K-34 ..... .32	D-4 ..... .77
A-1 ..... .31	C-1 ..... .41	No. 44	K-40 ..... .53	D-5 ..... .55
K-1 ..... .31	C-2 ..... .46	A-3 ..... .31	K-44 ..... .33	D-13 ..... .49
No. 29	C-21 ..... .57	K-1 ..... .37	K-45 1/2 ..... .85	E-1 ..... .41
K-1 ..... .64	E-1 ..... .30			

DETACHABLE LINK BELTING ATTACHMENT LINKS

PRICE LIST—PER FOOT

For illustrations see pages following this list.

No. 52—Cont'd	No. 57	No. 67—Cont'd	No. 78	No. 85—Cont'd
F-2 .....\$0.53	A-1 .....\$0.37	A-11 .....\$0.42	A-1 .....\$0.57	M-3 .....\$0.95
G-1 .....40	A-3 .....41	A-72 .....63	A-3 .....72	S-2 .....79
K-1 .....43	C-1 .....37	D-5 .....53	A-11 .....61	No. 88
K-5 .....40	C-4 .....27	D-26 .....55	A-16 .....1.04	
No. 53 Keeper	D-5 .....46	E-1 .....46	A-33 .....76	A-1 .....85
C-1 .....40	D-25 .....31	F-2 .....59	A-63 .....75	A-3 .....85
E-1 .....35	EA-1 .....48	FF .....60	D-5 .....80	A-7 .....77
S-1 .....37	EA-2 .....41	G-1 .....61	E-1 .....58	A-11 .....73
No. 54	E-1 .....33	H-1 .....61	F-2 .....85	C-1 .....94
Elevator	F-2 .....53	K-1 .....49	F-4 .....87	D-5 .....82
Bar .....29	H-1 .....51	S-2 .....43	G-1 .....72	D-38 .....1.46
Elevator	H-2 .....54	Tube, each	G-6 .....83	DH .....1.58
Bar, Special	K-1 .....43	No. 75	G-19 .....81	DF-14 with
.....28	K-1 Coupler,		H-1 .....36	.81 roller .....1.67
No. 55	pair .....54	C-4 .....36	H-1 .....81	E-1 .....79
A-1 .....31	M-3 .....51	E-1 .....44	H-2 .....85	F-2 .....97
A-2 .....40	S-2 .....40	F-2 .....64	H-6 .....1.39	F-4 .....87
A-3 .....40	Tube, each	G-1 .....62	H-6 Top	F-8 .....1.08
A-11 .....42	No. 59	H-1 .....55	each .....16	F-14 .....94
A-14 .....43		A-23 .....33	H-2 .....55	H-221.26	G-1 .....81
A-4152	No. 62	H-3 .....63	K-1 .....58	G-6 .....90
C-1 .....39		G-1 .....69	K-3 .....31	G-8 .....88
C-5 .....53	No. 65	K-1 .....48	M-3 .....85	G-10 .....1.50
C-8 .....55		OH-2 .....41	R-1 .....52	G-19 .....99
C-20 .....69	A-1 .....40	R-3 .....36	R-3 .....61	H-1 .....93
D-5 .....43	A-2 .....41	R-8 .....36	R-8 .....55	H-2 .....95
E-1 .....31	A-3 .....42	R-20 .....42	R-20 .....76	H-5 .....1.13
F-2 .....43	A-12 .....48	No. 77	S-2 .....64	H-6 .....1.58
G-15 .....42	C-1 .....48		A-1 .....46	No. 83	H-6 Top,
G-1637	D-5 .....55	A-12 .....68	D-582		each .....16
G-2743	G Special .....77	A-23 .....60	E-1 .....70	H-9 .....79
K-1 .....35	K-1 .....43	A-112 .....59	E-2 .....70	K-1 .....75
K-5 .....37	K-5 .....41	C-1 .....49	F-2 .....1.13	K-5 .....1.12
K-40 4 1/2 .....64	K-40 .....72	D-5 3/4 .....66	F-15 .....81	M-3 .....1.05
K-40 5 3/4 .....71	S-1 .....40	E-1 .....47	FF .....1.07	R-1 .....63
K-52 .....40	No. 62 1/2	F-2 .....79	G-1 .....91	R-2 .....63
L-2 .....31		A-3 .....42	G-1 .....59	K-177	R-8 .....66
M-136	A-52 .....53	G-6 .....63	M-3 .....92	S-2 .....76
S-1 .....31	No. 65	G-16 .....63	No. 85	No. 88 1/2
S-5 .....37		B-165			E-2 .....88
X51	B-2 .....70	H-1 .....59	F-2 .....1.19	F-8 .....1.41
No. 55 Keeper	H-2 .....63	F-1 .....63	F-1 .....1.13	G-6 .....1.13
A-2 .....42	No. 66	H-9 .....71	F-2 .....1.13	K-1 .....1.02
A-4154		C-149	K-152	F-51.29
No. 55 1/2	K-152	K-355	F-899	G-11.10
	A-25 .....41	No. 67	L-20 .....37	No. 95
A-41 .....53	A-1 .....40		M-366		H-1 .....88
No. 057	A-7 .....46	R-1 .....40	K-2 .....88	F-2 .....1.34
L-3 .....31	A-7 Coupler,	R-3 .....44	K-4 .....97	H-1 .....1.05
L-4 .....46	pair .....59	S-2 .....48	K-7 .....90	K-2 .....1.03

DETACHABLE LINK BELTING ATTACHMENT LINKS

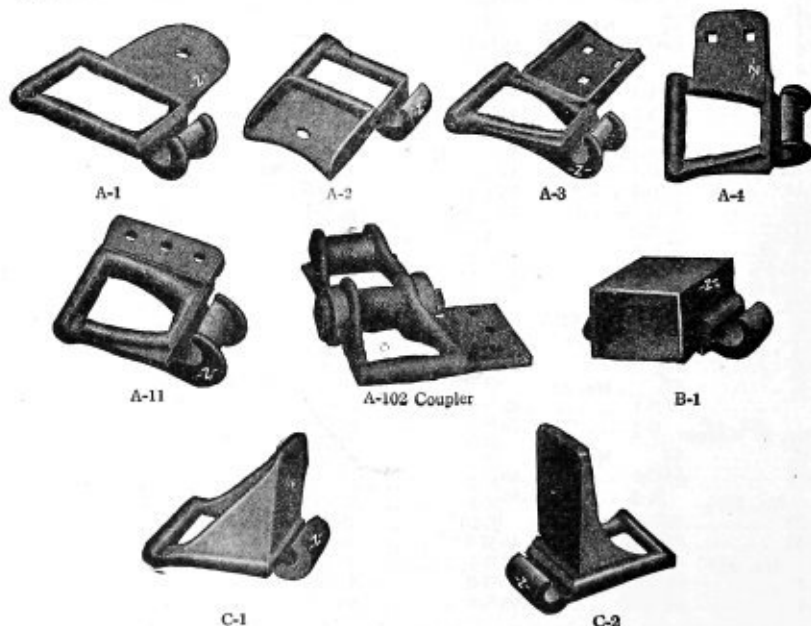
PRICE LIST—PER FOOT

No. 101	No. 103—Cont'd	No. 104 $\frac{1}{2}$	No. 110	No. 124
A-3 .....\$1.05	F-8 .....\$1.53	F-2 .....\$1.71	F-2 .....\$1.54	A-4 .....\$1.70
No. 103	G-6 1.38	K-2 1.57	K-2 1.37	A-11 1.76
A-1 1.12	G-10 1.38			D-5 2.11
A-4 1.15	G-18 2.06	No. 105	No. 114	F-2 1.87
A-4 Coupler,	G-19 1.32	F-1 ..... .84	A-11 1.29	F-8 2.24
pair 1.18	H-1 1.16	H-4-8" 1.89	DD 1.89	G-1 1.79
A-11 1.12	H-2 1.25	H-24 1.85	F-8 1.62	G-6 1.92
A-24 1.19	K-1 1.16	K-2 1.18	F-12 2.02	K-1 1.90
A-102 Coup-	K-1 Coup-	M-3 1.39	G-6 2.02	M-3 1.93
ler, pair. 1.34	ler, pair. 1.18		K-1 1.48	R-1 1.48
D-5 1.25	K-2 1.20	No. 108	M-3 1.52	No. 146
D-5-F-2,	K-8 1.17	F-2 1.43		E-2 1.67
each 1.22	L-2 1.20	FF 1.37	No. 122	F-2 1.81
DD 1.70	M-3 1.41	G-1 1.18	F-2 1.92	F-5 1.78
E-1 1.15	M-11 1.18	G-1 1.25	K-2 2.02	K-2 2.14
F-2 1.36	R-1 1.01	K-2 1.25	K-4 1.78	K-4 1.78

ILLUSTRATIONS OF ATTACHMENT LINKS

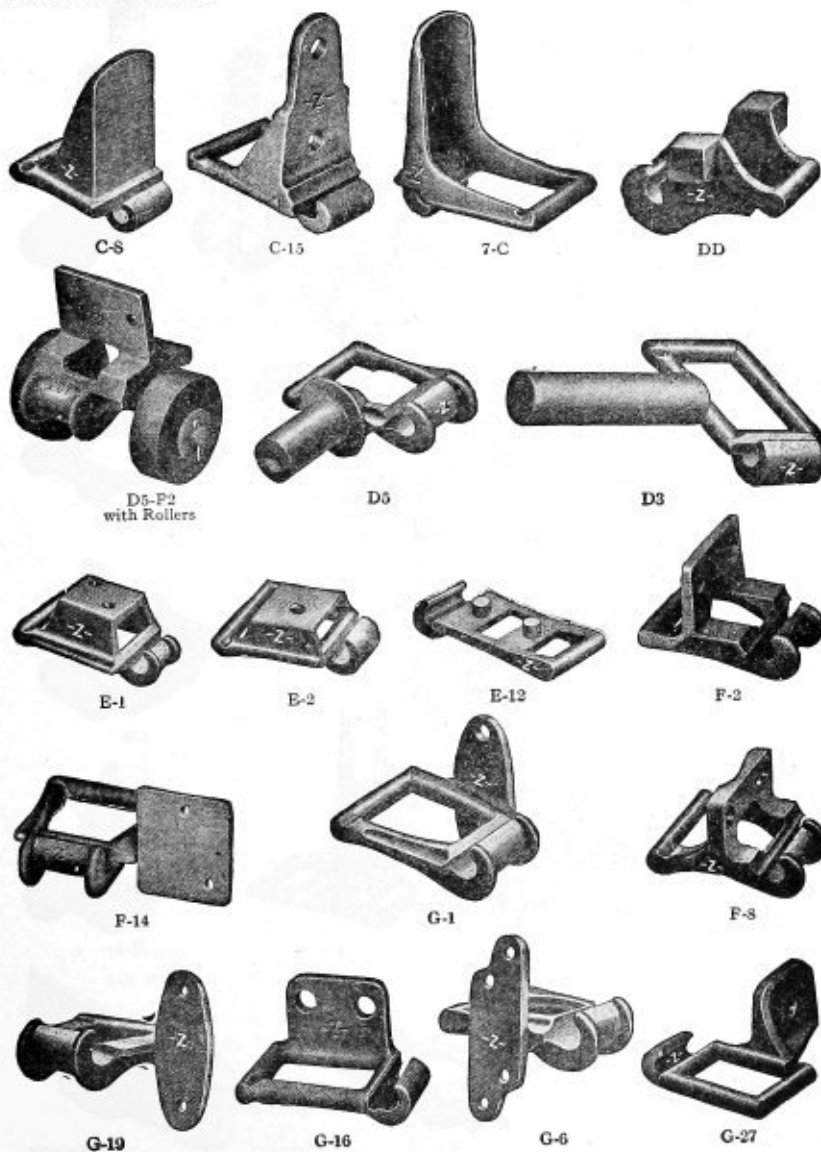
The following cuts show some of the more common styles.

See foregoing price list to ascertain which attachment links are made for the various sizes of chain.



DETACHABLE LINK BELTING—ATTACHMENT LINKS

See foregoing price list to ascertain which attachment links are made for the various sizes of chain.



DETACHABLE LINK BELTING ATTACHMENT LINKS

See foregoing price list to ascertain which attachment links are made for the various sizes of chain.



SPROCKET WHEELS

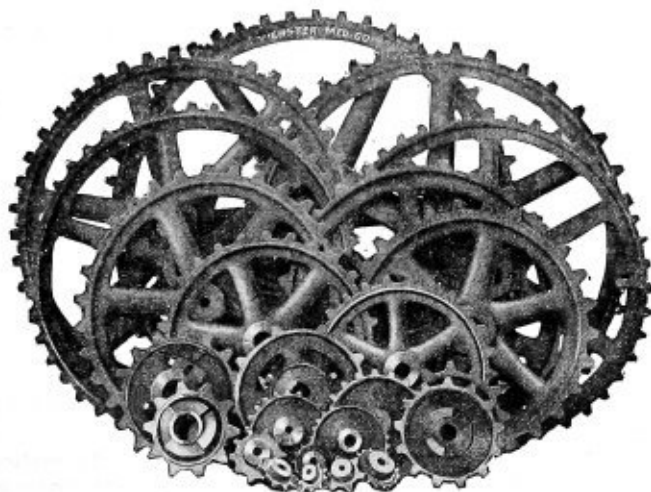


FIG. 4968

For most efficient service, sprockets of less than 10 teeth should not be used, if avoidable. This does not apply to chains of 6-inch pitch and larger.

Orders for sprockets should specify:

1. Number and style of chain.
2. Pitch diameter.
3. Number of teeth.
4. Solid or split.
5. Bore, and whether keyseated or setscrewed, or both. (See Notes A and B below.)
6. If chilled rim is wanted. Unless otherwise stated, sprockets of grey iron are supplied. (See next page.)

Note A—Sprockets with bores greater than the listed "largest at regular price," are subject to extra charges, per list on next page.

Note B—Sprockets are regularly supplied either keyseated or setscrewed, as desired. If wanted both keyseated and setscrewed, or with hub face, extra charges are made

SPROCKETS WITH CHILLED RIMS



FIG. 4969

In the lists on succeeding pages the numbers bearing a prefixed letter "C" can be supplied with Chilled Rims.

These Chilled Rim Sprocket Wheels have smooth, hard rim surfaces, with deep chills which make them especially well adapted for severe service in places where sand, grit, ashes, cement or other abrasive materials are present.

The slightly greater cost for these wheels as compared to plain grey iron is repaid many times over by the increase in resistance to wear and the resultant lengthening of life in service. A trial invariably demonstrates their economy and value.

SPROCKETS OF CAST STEEL

When great strength, toughness and hardness are required these sprockets may be made of cast steel.

Sprockets may be supplied in semi-steel, phosphor bronze, or other special alloys, as requirements dictate.

EXTRA CHARGES FOR LARGE BORES

Largest Bore at Regular Price, Inches	Larger Bores, Inches										
	1½	2½	2½	3¼	3½	4¼	4½	5¼	5½	6¼	6½
	Additional To List Price Of Wheel										
1½	\$0.25	\$0.62	\$1.12	\$1.75	\$2.50						
1¾	.25	.50	1.00	1.62	2.37						
1⅝		.37	.90	1.55	2.30	\$3.12					
2¼			.50	1.40	2.40	3.40	\$4.50				
2⅝				.75	1.95	3.30	4.80	\$6.30			
3¼					1.05	2.70	4.40	6.30	\$8.50		
3⅝						1.35	3.50	5.70	8.20	\$10.80	\$14.60
4¼							1.50	3.80	6.30	9.00	12.00
4⅝								1.80	4.70	7.80	11.20

SPROCKET WHEELS

FOR

DETACHABLE LINK BELTING

Bored, with Keyseat or Set Screws

Price List in effect July 15, 1916



FIG. 4970

Pitch Diameter, Inches	No. of Teeth	Price		Pitch Diameter, Inches	No. of Teeth	Price		Pitch Diameter, Inches	No. of Teeth	Price	
		Solid	Split			Solid	Split			Solid	Split
No. 25-31											
Largest Bore* at Regular Price 1 ⁷ / ₁₆ in.											
1 ³ / ₄	6	1.60	....	3 ³ / ₄	10	1.80	3.15	16	36	4.45	6.40
2	7	1.60	....	4	11	1.85	3.25	18 ¹ / ₄	41	5.05	7.10
2 ¹ / ₄	8	1.60	2.90	4 ¹ / ₂	12	1.90	3.30	24	54	6.50	8.75
2 ¹ / ₂	9	1.65	2.95	4 ³ / ₄	13	1.95	3.35	No. 35-45-55			
3	10	1.70	3.00	5 ¹ / ₄	14	2.00	3.40	Also Nos. 47, 65, 55 Keeper, 657 and L-111			
3 ¹ / ₄	11	1.70	3.00	5 ¹ / ₂	16	2.10	3.55	Largest Bore* at Regular Price 1 ¹¹ / ₁₆ in.			
3 ¹ / ₂	12	1.75	3.05	6 ¹ / ₄	17	2.15	3.60	2 ¹ / ₄	4	2.00	....
3 ³ / ₄	13	1.75	3.05	7 ¹ / ₄	20	2.30	3.75	2 ³ / ₄	5	2.00	....
4	14	1.80	3.10	7 ¹ / ₂	21	2.40	3.95	3 ¹ / ₄	6	2.05	....
4 ¹ / ₄	15	1.80	3.10	8	22	2.45	4.00	3 ¹ / ₂	7	2.10	....
4 ¹ / ₂	16	1.85	3.20	8 ¹ / ₄	24	2.60	4.15	4 ¹ / ₄	8	2.15	3.70
5	17	1.90	3.25	9 ¹ / ₄	25	2.70	4.25	4 ¹ / ₂	9	2.20	3.75
5 ¹ / ₄	18	1.90	3.25	9 ¹ / ₂	26	2.80	4.40	5 ¹ / ₄	10	2.25	3.80
5 ¹ / ₂	19	1.95	3.30	11	30	3.15	4.75	5 ¹ / ₂	11	2.35	4.00
6	21	2.05	3.40	11 ¹ / ₄	32	3.30	4.95	6 ¹ / ₄	12	2.40	4.05
6 ¹ / ₄	22	2.10	3.45	14	38	3.90	5.60	6 ¹ / ₂	13	2.50	4.15
7 ¹ / ₂	26	2.30	3.70	16 ¹ / ₄	44	4.45	6.30	7 ¹ / ₄	14	2.65	4.30
8	28	2.40	3.80	No. 33-34				7 ¹ / ₂	15	2.75	4.40
8 ¹ / ₄	30	2.50	3.90	Largest Bore* at Regular Price 1 ⁷ / ₁₆ in.				8 ¹ / ₄	16	2.85	4.60
9	32	2.60	4.00	2 ³ / ₄	6	1.70	....	8 ³ / ₄	17	3.00	4.75
10 ¹ / ₄	36	2.90	4.35	3 ¹ / ₄	7	1.75	....	9 ¹ / ₄	18	3.15	4.90
12	42	3.35	4.85	3 ¹ / ₂	8	1.80	3.25	9 ¹ / ₂	19	3.30	5.05
13 ¹ / ₄	48	3.75	5.30	4	9	1.85	3.30	10 ¹ / ₄	20	3.40	5.15
16	56	4.35	6.00	4 ¹ / ₂	10	1.90	3.35	11	21	3.60	5.55
18 ¹ / ₄	64	5.00	6.70	5	11	2.00	3.50	11 ¹ / ₂	22	3.80	5.75
20	70	5.50	7.25	5 ¹ / ₂	12	2.05	3.55	12	23	3.95	5.90
				6 ¹ / ₄	14	2.20	3.70	12 ¹ / ₄	24	4.15	6.10
				6 ¹ / ₂	15	2.30	3.80	14	27	4.65	6.75
				7 ¹ / ₄	16	2.40	3.95	15 ¹ / ₂	30	5.20	7.30
				8 ¹ / ₄	19	2.60	4.15	16	31	5.35	7.55
				8 ¹ / ₂	22	2.90	4.55	18	35	6.05	8.25
				9 ¹ / ₄	24	3.10	4.75	18 ¹ / ₂	36	6.25	8.65
				10 ¹ / ₄	27	3.45	5.15	19 ¹ / ₄	38	6.65	9.05
				14 ¹ / ₄	32	4.00	5.85				

*Extra charges for wheels bored larger than listed above shown on page 1772.

SPROCKET WHEELS

FOR DETACHABLE LINK BELTING

Price List—Continued

Pitch Diameter, Inches	No. of Teeth	Price		Pitch Diameter, Inches	No. of Teeth	Price		Pitch Diameter, Inches	No. of Teeth	Price	
		Solid	Split			Solid	Split			Solid	Split
No. 35-45-55—Cont'd				No. 51—Continued				No. 57-67-77—Continued			
20 $\frac{1}{4}$	39	6.80	9.20	10	27	3.10	4.70	C 5 $\frac{1}{4}$	7	2.40	
20 $\frac{3}{4}$	40	6.95	9.35	12 $\frac{1}{4}$	33	3.60	5.25	6	8	2.55	4.25
21 $\frac{1}{4}$	42	7.30	9.90	14	39	4.20	5.90	6 $\frac{3}{4}$	9	2.70	4.40
23 $\frac{1}{4}$	45	7.85	10.45	15 $\frac{1}{2}$	42	4.55	6.40	7 $\frac{1}{2}$	10	2.90	4.60
25 $\frac{3}{4}$	50	8.75	11.60					8 $\frac{1}{4}$	11	3.10	5.00
28	54	9.50	12.65	No. 52				C 9	12	3.30	5.20
28 $\frac{1}{2}$	55	9.75	12.90	Also Nos. 052, 52 $\frac{1}{2}$ Heavy, and 063				C 9 $\frac{1}{2}$	13	3.50	5.40
30	58	10.35	13.75	Largest Bore* at Regular Price 1 $\frac{15}{16}$ in.				10 $\frac{1}{4}$	14	3.75	5.65
35 $\frac{3}{4}$	69	12.85	16.80					11	15	4.00	5.90
No. 42								C 11 $\frac{3}{4}$	16	4.25	6.40
Also No. 042								12 $\frac{1}{2}$	17	4.50	6.65
Largest Bore* at Regular Price 1 $\frac{11}{16}$ in.								13 $\frac{1}{4}$	18	4.75	6.90
2	5	1.85		3 $\frac{1}{4}$	7	1.95		14	19	5.00	7.15
2 $\frac{3}{4}$	6	1.85		3 $\frac{3}{4}$	8	2.00	3.55	14 $\frac{3}{4}$	20	5.25	7.40
3 $\frac{1}{4}$	7	1.90		4 $\frac{1}{4}$	9	2.10	3.65	15 $\frac{1}{2}$	21	5.50	7.95
4	9	2.00	3.45	4 $\frac{3}{4}$	10	2.15	3.70	C 16 $\frac{1}{4}$	22	5.75	8.20
4 $\frac{1}{2}$	10	2.05	3.50	5 $\frac{1}{4}$	11	2.25	3.90	17	23	6.00	8.45
4 $\frac{3}{4}$	11	2.10	3.60	5 $\frac{3}{4}$	12	2.30	3.95	17 $\frac{3}{4}$	24	6.25	8.70
5 $\frac{1}{4}$	12	2.15	3.65	6 $\frac{1}{4}$	13	2.40	4.05	18 $\frac{1}{4}$	25	6.50	8.95
5 $\frac{3}{4}$	13	2.25	3.75	6 $\frac{3}{4}$	14	2.50	4.15	19	26	6.75	9.45
6	14	2.30	3.80	7 $\frac{1}{4}$	15	2.60	4.25	C 19 $\frac{3}{4}$	27	7.10	9.80
7 $\frac{1}{2}$	17	2.55	4.10	7 $\frac{3}{4}$	16	2.70	4.45	20 $\frac{1}{2}$	28	7.35	10.05
8	18	2.70	4.25	8 $\frac{1}{4}$	17	2.80	4.55	22	30	7.90	10.60
8 $\frac{1}{4}$	19	2.80	4.35	8 $\frac{3}{4}$	18	2.90	4.65	23 $\frac{1}{2}$	32	8.50	11.55
9 $\frac{1}{2}$	22	3.10	4.75	9	19	3.05	4.80	24 $\frac{1}{4}$	33	8.80	11.85
10 $\frac{1}{2}$	24	3.35	5.00	9 $\frac{1}{2}$	20	3.15	4.90	25	34	9.10	12.15
11 $\frac{3}{4}$	27	3.70	5.40	10	21	3.30	5.20	25 $\frac{3}{4}$	35	9.40	12.45
14	32	4.25	6.10	10 $\frac{1}{2}$	22	3.40	5.30	C 26 $\frac{1}{2}$	36	9.70	13.15
15 $\frac{3}{4}$	36	4.80	6.75	11	23	3.55	5.45	C 28	38	10.30	13.75
17 $\frac{3}{4}$	41	5.45	7.50	12	25	3.85	5.75	30	41	11.20	15.05
20	46	6.15	8.30	12 $\frac{1}{2}$	26	4.00	6.00	32 $\frac{1}{2}$	44	12.10	15.95
24	55	7.40	9.65	13 $\frac{1}{2}$	28	4.30	6.30	36	49	13.75	18.05
No. 51				14 $\frac{1}{2}$	30	4.60	6.60	38 $\frac{1}{4}$	52	14.80	19.55
Largest Bore* at Regular Price 1 $\frac{15}{16}$ in.				16 $\frac{1}{4}$	34	5.30	7.40	39 $\frac{3}{4}$	54	15.50	20.25
Regular Price				18 $\frac{1}{4}$	38	5.95	8.15	41 $\frac{1}{4}$	56	16.20	21.45
No. 57-67-77				19 $\frac{1}{4}$	40	6.30	8.50	44	60	17.60	22.85
Also Riveted Nos. 60 and 73				20 $\frac{1}{4}$	42	6.60	8.95	No. 62			
Also Steel Bushed Roller No. 67				22	46	7.30	9.80	Also Nos. 062, 62 $\frac{1}{2}$, 71, 072 and 72 $\frac{1}{2}$			
Largest Bore* at Regular Price 2 $\frac{7}{16}$ in.				23 $\frac{1}{2}$	49	7.80	10.30	Also Riveted Nos. 62 and T-62			
Regular Price				24	50	8.00	10.50	Largest Bore* at Regular Price 2 $\frac{7}{16}$ in.			
No. 57-67-77				26 $\frac{1}{2}$	55	8.80	11.50				
Regular Price				30 $\frac{1}{2}$	64	10.35	13.45				
No. 57-67-77				36	75	12.20	15.75				
Regular Price				No. 57-67-77							
No. 57-67-77				Also Riveted Nos. 60 and 73							
Regular Price				Also Steel Bushed Roller No. 67							
Largest Bore* at Regular Price 2 $\frac{7}{16}$ in.				Largest Bore* at Regular Price 2 $\frac{7}{16}$ in.							
Regular Price				No. 57-67-77							
No. 57-67-77				Regular Price							
Regular Price				No. 57-67-77							
No. 57-67-77				Regular Price							
Regular Price				No. 57-67-77							
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Regular Price											

SPROCKET WHEELS **FOR DETACHABLE LINK BELTING** **Price List—Continued**

Pitch Diameter, Inches	No. of Teeth	Price		Pitch Diameter, Inches	No. of Teeth	Price		Pitch Diameter, Inches	No. of Teeth	Price	
		Solid	Split			Solid	Split			Solid	Split
No. 62—Continued				Nos. 75-78-88—Continued				Nos. 85-94-95			
6 $\frac{1}{4}$	12	\$ 2.55	\$ 4.30	C 11 $\frac{1}{4}$	14	\$ 4.90	\$ 7.10	Also Riveted Nos. 85 and 95			
7 $\frac{1}{2}$	14	2.75	4.50	C 12 $\frac{1}{4}$	15	5.20	7.40	Also Combination Nos. 102 and 102 $\frac{1}{2}$			
8	15	2.90	4.65	C 13 $\frac{1}{4}$	16	5.55	8.25	Largest Bore* at Regular Price 2 $\frac{15}{16}$ in.			
8 $\frac{1}{2}$	16	3.05	5.00	C 14 $\frac{1}{4}$	17	5.90	8.60	7 $\frac{3}{4}$	6	\$ 4.70	\$ 7.30
C 9 $\frac{1}{2}$	18	3.35	5.30	C 15	18	6.25	8.95	C 10 $\frac{1}{2}$	8	5.70	8.30
10 $\frac{1}{2}$	20	3.65	5.60	C 15 $\frac{1}{4}$	19	6.60	9.30	12 $\frac{3}{4}$	10	6.80	9.40
11 $\frac{1}{2}$	22	3.95	6.05	C 16 $\frac{1}{4}$	20	6.95	9.65	C 14	11	7.30	10.65
12 $\frac{1}{4}$	23	4.10	6.20	C 17 $\frac{1}{4}$	21	7.30	10.50	15 $\frac{1}{2}$	12	7.80	11.15
13 $\frac{1}{4}$	26	4.55	6.90	C 18 $\frac{1}{4}$	22	7.65	10.85	16 $\frac{1}{2}$	13	8.40	11.75
C 14 $\frac{1}{4}$	28	4.90	7.25	C 20	24	8.35	11.55	C 18	14	9.00	12.35
15 $\frac{1}{4}$	30	5.30	7.65	C 20 $\frac{1}{4}$	25	8.70	11.90	C 19	15	9.70	13.05
16 $\frac{1}{4}$	32	5.70	8.20	C 22 $\frac{1}{2}$	27	9.40	13.15	C 20 $\frac{1}{2}$	16	10.40	14.70
18	34	6.10	8.60	C 23 $\frac{1}{4}$	28	9.75	13.50	C 24 $\frac{1}{4}$	19	12.40	16.70
20	38	6.90	9.60	C 24 $\frac{1}{4}$	29	10.10	13.85	C 25 $\frac{1}{2}$	20	13.00	17.30
22 $\frac{1}{4}$	43	7.90	10.85	C 25	30	10.45	14.20	26 $\frac{1}{4}$	21	13.75	19.05
23 $\frac{1}{4}$	45	8.35	11.30	C 25 $\frac{1}{4}$	31	10.80	15.10	C 30 $\frac{1}{2}$	24	16.50	21.80
25 $\frac{1}{4}$	49	9.25	12.50	C 26 $\frac{1}{4}$	32	11.15	15.45	35 $\frac{3}{4}$	28	20.90	27.20
30 $\frac{1}{2}$	58	11.80	15.70	C 28 $\frac{1}{4}$	34	11.95	16.25				
				29 $\frac{1}{4}$	35	12.35	16.65				
				C 30	36	12.75	17.60				
				30 $\frac{3}{4}$	37	13.20	18.05				
				C 32 $\frac{1}{2}$	39	14.10	18.95				
				C 33 $\frac{1}{4}$	40	14.60	19.45				
				C 35 $\frac{1}{4}$	43	16.20	21.65				
				C 36 $\frac{1}{2}$	44	16.75	22.20				
				C 38 $\frac{1}{4}$	46	17.85	23.90				
				40 $\frac{1}{4}$	49	19.50	25.55				
				41 $\frac{1}{2}$	50	20.00	26.05				
				C 48 $\frac{1}{4}$	58	24.80	32.10				
No. 66				Nos. 83-93				No. 103			
Largest Bore* at Regular Price 2 $\frac{7}{16}$ in.				All Double Teeth				Also Riveted Nos. 82 and T-103			
5	8	\$2.30	\$3.90					Also Combination No. 131			
5 $\frac{1}{4}$	9	2.40	4.00					Also Steel Bushed Roller No. 103			
7	11	2.70	4.40					Largest Bore* at Regular Price 3 $\frac{1}{16}$ in.			
7 $\frac{1}{2}$	12	2.85	4.55					6	6	\$ 3.60	\$ 6.05
8 $\frac{1}{2}$	13	3.00	4.70					7	7	4.00	6.45
10 $\frac{1}{2}$	16	3.60	5.45					C 8	8	4.40	6.85
12	19	4.20	6.05					C 9	9	4.80	7.25
16 $\frac{1}{4}$	25	5.60	7.60					C 9 $\frac{1}{4}$	10	5.25	7.70
								C 10 $\frac{1}{4}$	11	5.65	8.65
								C 11 $\frac{1}{4}$	12	6.05	9.05
								C 12 $\frac{1}{4}$	13	6.45	9.45
								C 13 $\frac{1}{4}$	14	6.85	9.85
								C 14 $\frac{1}{4}$	15	7.25	10.25
								C 15 $\frac{1}{4}$	16	7.65	11.30
								C 16 $\frac{1}{4}$	17	8.05	11.70
								C 17 $\frac{1}{2}$	18	8.45	12.10
								C 18 $\frac{1}{2}$	19	8.90	12.55
								C 19 $\frac{1}{2}$	20	9.40	13.05
								20 $\frac{1}{2}$	21	9.90	14.30
								C 21 $\frac{1}{2}$	22	10.35	14.75
								22 $\frac{1}{2}$	23	10.80	15.20
								C 23 $\frac{1}{2}$	24	11.20	15.60
								24 $\frac{1}{2}$	25	11.70	16.10
								C 25 $\frac{1}{2}$	26	12.25	17.45
								26 $\frac{1}{2}$	27	12.75	17.95

*Extra charges for wheels bored larger than listed above shown on page 1772.

SPROCKET WHEELS

FOR DETACHABLE LINK BELTING

Price List—Continued

Pitch Diameter, Inches		No. of Teeth		Price	
				Solid	Split
No. 103—Continued					
C 27 $\frac{1}{4}$	28	\$13.30	\$18.50		
28 $\frac{1}{4}$	29	13.85	19.05		
C 29 $\frac{1}{4}$	30	14.40	19.60		
C 30 $\frac{1}{4}$	31	15.20	21.15		
C 31 $\frac{1}{4}$	32	16.00	21.95		
C 32 $\frac{1}{4}$	33	16.80	22.75		
33 $\frac{1}{4}$	34	17.60	23.55		
C 34 $\frac{1}{4}$	35	18.40	24.35		
C 35 $\frac{1}{4}$	36	19.25	26.00		
C 37 $\frac{1}{4}$	38	21.20	27.95		
39 $\frac{1}{4}$	40	23.10	29.85		
41	42	24.80	32.25		
44	45	27.35	34.80		
45	46	28.20	36.40		
48	49	30.75	38.95		
52 $\frac{3}{4}$	54	34.90	43.85		
C 56 $\frac{1}{2}$	58	38.30	47.95		
C 59 $\frac{1}{2}$	61	41.00	51.35		
61 $\frac{1}{2}$	63	42.80	53.15		
65 $\frac{1}{2}$	67	46.50	57.60		
79	81	70.00	83.20		
No. 105					
Largest Bore* at Regular Price 3 $\frac{7}{16}$ in.					
11 $\frac{3}{4}$	8	\$ 6.20	\$ 9.50		
15 $\frac{3}{4}$	6	8.00	11.85		
19 $\frac{1}{2}$	10	10.00	13.85		
21	11	10.50	15.35		
23 $\frac{1}{4}$	12	11.00	15.85		
25 $\frac{1}{4}$	13	12.20	17.05		
27 $\frac{1}{4}$	14	14.40	19.25		
30	15	15.00	19.85		
48 $\frac{1}{2}$	25	30.00	38.25		
Nos. 108-110					
Also Riveted No. 108					
Also Combination No. 111					
Largest Bore* at Regular Price 3 $\frac{7}{16}$ in.					
12 $\frac{1}{4}$	8	\$ 6.80	\$10.10		
13 $\frac{3}{4}$	9	7.50	10.80		
C 16 $\frac{3}{4}$	11	9.10	13.35		
C 18 $\frac{1}{4}$	12	9.90	14.15		
C 19 $\frac{1}{4}$	13	10.90	15.15		
C 21 $\frac{1}{4}$	14	12.00	16.25		
No. 102					
Also Riveted Nos. 87 and 124					
Also Steel Bushed Roller No. 124					
Largest Bore* at Regular Price 3 $\frac{11}{16}$ in.					
9 $\frac{1}{4}$	7	\$ 5.80	\$ 8.80		
10 $\frac{1}{2}$	8	6.20	9.20		
11 $\frac{3}{4}$	9	6.90	9.90		
C 13	10	7.70	10.70		
C 14 $\frac{1}{2}$	11	8.50	12.35		
C 15 $\frac{1}{4}$	12	9.40	13.25		
C 17	13	10.20	14.05		
C 18 $\frac{1}{4}$	14	11.00	14.85		
C 19 $\frac{1}{2}$	15	12.00	15.85		
C 20 $\frac{3}{4}$	16	13.00	17.85		
C 22	17	14.20	19.05		
23	18	15.20	20.05		
C 24 $\frac{1}{2}$	19	16.20	21.05		
C 26	20	17.30	22.15		
28 $\frac{1}{2}$	22	19.50	25.45		
29 $\frac{3}{4}$	23	20.60	26.55		
C 31	24	21.70	27.65		
C 36 $\frac{1}{2}$	28	26.10	33.15		
41 $\frac{1}{4}$	32	30.80	38.95		
C 44	34	33.00	41.15		
49 $\frac{1}{2}$	38	38.00	47.25		
50 $\frac{1}{2}$	39	39.40	48.65		
59 $\frac{1}{2}$	46	72.00	83.50		
No. 122					
Also Combination No. 132					
Largest Bore* at Regular Price 3 $\frac{15}{16}$ in.					
12	6	\$ 8.25	\$12.10		
14	7	9.00	13.40		
16	8	9.75	14.70		
C 18	9	10.80	15.75		
20	10	12.80	17.75		
21 $\frac{1}{4}$	11	14.60	20.90		
No. 146					
Largest Bore* at Regular Price 3 $\frac{15}{16}$ in.					
16	8	\$11.50	\$16.15		
18	9	12.65	17.30		
20	10	13.70	18.35		
24	12	15.80	21.30		
30	15	19.00	24.50		
36	18	24.00	30.60		

*Extra charges for wheels bored larger than listed above shown on page 1772.

TRACTION WHEELS
FOR
DETACHABLE LINK BELTING

**BORED, WITH KEYSEAT
OR SET SCREWS**



FIG. 4971

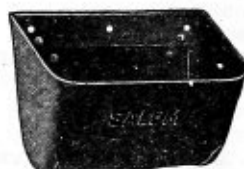
PRICE LIST

Pitch Diam. Inches	Price		Pitch Diam., Inches	Price		Pitch Diam., Inches	Price	
	Solid	Split		Solid	Split		Solid	Split
No. 75-78-88 Largest Bore* at $2\frac{15}{16}$ in. Regular Price			No. 103-114 Also Combination No. 131 Largest Bore* at $3\frac{7}{16}$ in. Regular Price			No. 122 Also Combination No. 132 Largest Bore* at $3\frac{15}{16}$ in. Regular Price		
12 $\frac{3}{4}$	\$ 4.80	\$ 6.80	C 12	\$ 6.05	\$ 8.75	14	\$10.00	\$13.50
C 14	5.50	7.95	C 13	6.85	9.55	19 $\frac{3}{4}$	12.80	17.30
16	6.20	8.65	C 14	7.25	9.95	C 23 $\frac{1}{2}$	16.50	22.20
20	8.00	10.90	18 $\frac{1}{2}$	8.90	12.20	C 24	17.10	22.80
24	9.50	12.90	C 24	11.70	15.70	25 $\frac{3}{4}$	18.00	23.70
30	11.90	16.30	C 27 $\frac{1}{2}$	13.30	18.00	26	18.25	23.95
			C 30	15.20	20.60	C 29 $\frac{1}{2}$	21.75	27.45
No. 85-94-95 Also Combination Nos. 102 and 102 $\frac{1}{2}$ Largest Bore* at $2\frac{45}{16}$ in. Regular Price			No. 108-110 Also Combination No. 111 Largest Bore* at $3\frac{7}{16}$ in. Regular Price			No. 124 Largest Bore* at $3\frac{15}{16}$ in. Regular Price		
12 $\frac{1}{2}$	\$ 6.50	\$ 8.85	13 $\frac{3}{4}$	\$ 7.75	\$10.75	C 18	\$13.00	\$16.50
16 $\frac{1}{2}$	7.40	10.45	16	9.00	12.85	C 24	15.00	19.40
C 19	8.50	11.55	C 18	9.90	13.75	C 27 $\frac{1}{2}$	17.50	22.90
C 20 $\frac{1}{2}$	8.80	12.70	20	11.00	14.85	C 30	20.20	25.60
C 24	11.50	15.40	21	12.00	15.85	C 42	33.00	40.40
25	12.00	15.90	C 24	14.00	19.10	No. 146 Largest Bore* at $3\frac{15}{16}$ in. Regular Price		
C 28	13.60	18.40	25	15.00	20.10	17 $\frac{1}{2}$	\$10.00	\$14.20
C 30	15.00	19.80	28	17.75	22.85	23 $\frac{3}{4}$	12.75	17.75
			C 30	18.50	23.60			

*Extra charges for wheels bored larger than listed above shown on page 1772.

ACME AND SALEM STEEL ELEVATOR BUCKETS

Style "A"

**FIG. 4972****FIG. 4973**

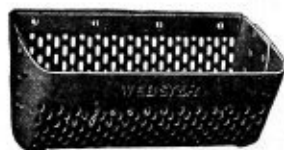
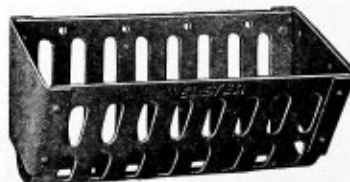
We are prepared to furnish either of these well-known one-piece steel elevator buckets. They differ only in the method of riveting the formed bucket together, the Salem being riveted on the back and the Acme on the end.

Style "B"

**FIG. 4974**

The Low Front or "B" Style Bucket is used on inclined elevators, or elevators handling clay, mud or sticky materials.

For sizes and prices, see following pages.

PERFORATED BUCKETS**FIG. 4975****FIG. 4976**

For draining water from the material being elevated we supply buckets made up of perforated and slotted steel. Prices on application.

ACME AND SALEM STEEL ELEVATOR BUCKETS

Continued

STYLE "A" OR STYLE "B"

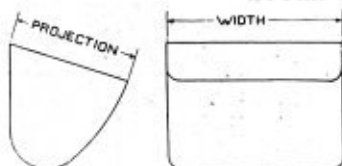


FIG. 4977

Prices given are for buckets black; add 65 per cent for galvanizing, to order only.

Price List and Capacities

Bucket Size, Inches		Capacity, Cu. Ft. per 100 Buckets, Style "A"	Price							
			For Light Materials		For Heavy Materials					
			Gauge	Price	16 Gauge	14 Gauge	12 Gauge	10 Gauge	8 Gauge	$\frac{1}{4}$ Inch
Width	Projection									
2½	2½	.33	24	\$0.10						
3	2½	.49	24	.10						
3½	2½	.58	24	.10						
3	3	.73	23	.10	\$0.29					
3½	3	.85	23	.10	.31					
4	3	.97	23	.15	.35					
4½	3	1.09	23	.15	.39					
3½	3½	1.16	22	.15	.36	\$0.39				
4	3½	1.33	22	.15	.38	.41				
4½	3½	1.49	22	.15	.40	.43				
5	4	1.91	22	.19	.48	.51	\$0.71			
5½	4	2.09	21	.22	.49	.53	.73			
6	4	2.28	21	.22	.50	.54	.75			
7	4	2.68	21	.30	.53	.57	.78			
8	4	3.04	21	.35	.55	.59	.82			
9	4	3.42	21	.40	.68	.73	1.01			
5	4½	2.98	20	.30	.51	.55	.76	\$0.94		
6	4½	3.57	20	.28	.54	.58	.80	.98		
7	4½	4.17	20	.31	.56	.60	.83	1.03		
8	4½	4.76	20	.38	.59	.63	.87	1.08		
9	4½	5.36	20	.45	.71	.77	1.06	1.31		
6	5	4.18	19	.43	.55	.59	.82	1.01	\$1.19	\$1.38
6½	5	4.54	19	.44	.59	.63	.87	1.08	1.27	1.46
7	5	4.89	19	.45	.60	.65	.89	1.10	1.30	1.50
7½	5	5.24	19	.46	.61	.66	.91	1.12	1.32	1.53
8	5	5.59	19	.38	.63	.68	.93	1.15	1.36	1.56
8½	5	5.94	19	.48	.70	.76	1.04	1.29	1.52	1.75
9	5	6.28	19	.40	.75	.81	1.12	1.38	1.63	1.88
9½	5	6.64	19	.50	.78	.84	1.15	1.43	1.68	1.94
10	5	6.98	19	.55	.81	.88	1.21	1.49	1.76	2.03
11	5	7.68	19	.60	.88	.95	1.30	1.61	1.90	2.19
12	5	8.47	19	.65	.93	1.00	1.38	1.70	2.01	2.31

For additional sizes see following page.

ACME AND SALEM STEEL ELEVATOR BUCKETS

Capacities and Price List—Continued

Bucket Size, Inches		Capacity, Cu. Ft. per 100 Buckets Style "A"	Price							
Width	Projection		For Light Materials		For Heavy Materials					
			Gauge	Price	16 Gauge	14 Gauge	12 Gauge	10 Gauge	8 Gauge	$\frac{7}{8}$ Inch
6	5 $\frac{1}{2}$	4.86	19	\$0.46	\$0.60	\$0.65	\$0.89	\$1.10	\$1.30	\$1.50
7	5 $\frac{1}{2}$	5.68	19	.49	.65	.70	.97	1.20	1.41	1.63
8	5 $\frac{1}{2}$	6.49	19	.53	.68	.73	1.01	1.24	1.47	1.69
9	5 $\frac{1}{2}$	7.30	19	.48	.80	.87	1.19	1.47	1.74	2.00
10	5 $\frac{1}{2}$	8.11	19	.48	.86	.93	1.28	1.58	1.87	2.15
11	5 $\frac{1}{2}$	8.91	19	.65	.93	1.00	1.36	1.70	2.01	2.31
12	5 $\frac{1}{2}$	9.73	19	.70	.98	1.05	1.43	1.79	2.12	2.44
9	6	9.16	18	.68	.85	.92	1.27	1.56	1.85	2.13
10	6	10.17	18	.55	.91	.95	1.36	1.67	1.98	2.28
11	6	11.18	18	.63	.98	1.05	1.45	1.79	2.12	2.44
12	6	12.20	18	.70	1.03	1.11	1.53	1.89	2.22	2.56
13	6	13.22	18	.85	1.04	1.12	1.54	1.90	2.25	2.59
14	6	14.23	18	.80	1.05	1.13	1.56	1.93	2.28	2.63
15	6	15.25	18	.95	1.08	1.16	1.60	1.98	2.33	2.69
16	6	16.27	18	.90	1.10	1.19	1.64	2.03	2.39	2.75
18	6	18.30	18	1.00	1.15	1.24	1.71	2.12	2.50	2.88
20	6	20.33	18	1.10	1.20	1.30	1.79	2.21	2.60	3.00
10	6 $\frac{1}{2}$	11.71	18	.85	1.04	1.12	1.54	1.90	2.25	2.59
12	6 $\frac{1}{2}$	12.88	18	.95	1.15	1.24	1.71	2.12	2.50	2.88
13	6 $\frac{1}{2}$	15.22	18	1.00	1.16	1.25	1.73	2.13	2.52	2.90
14	6 $\frac{1}{2}$	16.39	18	1.05	1.18	1.27	1.75	2.16	2.55	2.94
15	6 $\frac{1}{2}$	17.57	18	1.10	1.20	1.30	1.79	2.21	2.60	3.00
16	6 $\frac{1}{2}$	18.74	18	1.15	1.23	1.32	1.83	2.25	2.66	3.06
18	6 $\frac{1}{2}$	21.08	18	1.25	1.28	1.38	1.90	2.35	2.77	3.19
20	6 $\frac{1}{2}$	23.42	18	1.31	1.33	1.43	1.97	2.44	2.88	3.31
10	7	13.25	18	.75	1.16	1.25	1.73	2.13	2.52	2.90
11	7	14.58	18	.85	1.23	1.32	1.83	2.25	2.66	3.06
12	7	15.90	18	.90	1.28	1.38	1.90	2.35	2.77	3.19
13	7	17.21	18	1.13	1.29	1.39	1.91	2.37	2.79	3.21
14	7	18.55	18	.95	1.30	1.40	1.94	2.39	2.82	3.25
15	7	19.89	18	1.23	1.33	1.43	1.97	2.44	2.88	3.31
16	7	21.20	18	1.28	1.35	1.46	2.01	2.48	2.93	3.38
18	7	23.85	18	1.38	1.40	1.51	2.09	2.58	3.04	3.50
20	7	26.50	18	1.43	1.45	1.57	2.16	2.67	3.15	3.63
22	7	29.16	18	1.53	1.55	1.65	2.31	2.85	3.36	3.88
24	7	31.80	18	1.63	1.65	1.78	2.46	3.03	3.58	4.13
16	8	26.53	18	1.40	1.60	1.73	2.38	2.94	3.47	4.00
18	8	29.85	18	1.50	1.65	1.78	2.46	3.03	3.57	4.13
20	8	33.17	18	1.65	1.70	1.84	2.53	3.13	3.69	4.25

STANDARD PUNCHING FOR ELEVATOR BUCKETS

Unless otherwise ordered, all punching of buckets is done for a $\frac{1}{4}$ -inch bolt, for a flat belt, the number of holes being per the following table:

Bucket Widths, Inches	Number of Holes	Bucket Widths, Inches	Number of Holes	Bucket Widths, Inches	Number of Holes
2 to 6	2	10 to 13	4	16 to 20	6
7 to 9	3	14 to 15	5	.....	.....

MALLEABLE IRON BUCKETS

Style A



FIG. 4978

Style B



FIG. 4979

Style C



FIG. 4980

STYLE A

Length in Inches	Width or Projection in Inches	Depth in Inches	Price, Each	Approximate Capacity in Cubic Inches
4	2 $\frac{3}{4}$	3	\$0.31	16
5	3 $\frac{1}{2}$	3 $\frac{3}{4}$	.43	36
6	4	4 $\frac{1}{4}$	.55	55
7	4 $\frac{1}{2}$	5	.76	85
8	5	5 $\frac{1}{2}$	.90	115
10	6	6 $\frac{1}{4}$	1.45	204
11	6	6 $\frac{3}{4}$	1.55	223
12	6	6 $\frac{3}{4}$	1.65	246
12	7	7 $\frac{1}{4}$	1.90	332
14	7	7 $\frac{3}{4}$	2.20	391
14	8	8 $\frac{1}{2}$	3.00	509
15	7	7 $\frac{3}{4}$	2.35	425
16	7	7 $\frac{3}{4}$	2.70	467
16	8	8 $\frac{1}{2}$	3.00	593
18	8	8 $\frac{1}{2}$	5.40	668
18	10	10 $\frac{1}{2}$	5.85	1053

STYLE B

4	1 $\frac{1}{2}$	2 $\frac{1}{4}$	\$0.25	6
7	3 $\frac{1}{2}$	5	.58	55
8	3 $\frac{1}{2}$	5	.65	65
10	4	5 $\frac{1}{2}$	1.10	107
12	5 $\frac{1}{2}$	7 $\frac{1}{2}$	1.65	233
16	6 $\frac{1}{2}$	9	2.60	412

STYLE C

6	4 $\frac{1}{2}$	4	\$0.60	84
7	4 $\frac{1}{2}$	4	.75	98
8	4 $\frac{1}{2}$	4	.85	112
10	5	4	1.20	150
12	5	4	1.35	180
14	7	5 $\frac{1}{2}$	2.00	437
16	7	5 $\frac{1}{2}$	2.40	500

CONTINUOUS STEEL ELEVATOR BUCKETS

Style No. 1

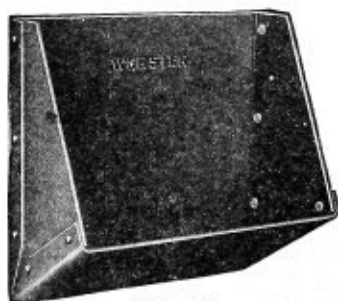


FIG. 4981

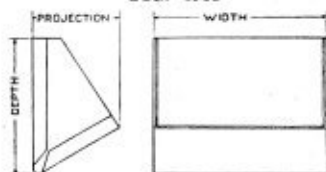


FIG. 4983

Style No. 2



FIG. 4982

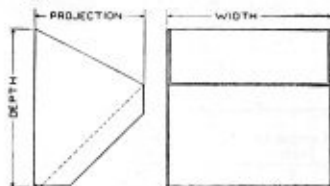


FIG. 4984

Styles Nos. 1 and 2—Capacities and Price List

Bucket Size, Inches			Capacity, Cu. Ft. per 100 Buckets	Price					
Width	Projection	Depth		Thickness of Steel					
				16 Gauge	14 Gauge	12 Gauge	10 Gauge	$\frac{3}{8}$ Inch	$\frac{1}{2}$ Inch
8	4½	7½	3.75	\$0.70	\$0.85	\$0.95	.....	.....	.....
9	5	7½	5.22	.75	.90	1.05	\$1.25	.....	.....
10	5½	9	7.02	.90	1.05	1.20	1.50	.....	.....
12	6	11¾	10.00	1.05	1.35	1.80	2.25	\$3.00	.....
14	7	11¾	15.89	.....	1.60	2.10	2.55	3.45	\$ 4.50
16	8	11¾	23.76	.....	1.85	2.30	2.80	3.70	4.75
18	9	11¾	33.81	.....	.....	2.60	3.25	4.10	5.30
18	10	17¾	41.76	.....	.....	.....	3.60	4.45	5.75
24	12	17¾	80.24	.....	.....	.....	5.20	6.85	8.35
30	12	17¾	100.22	.....	.....	.....	7.00	8.65	11.25

Style No. 3—Guide Wings on Ends



FIG. 4985

Style No. 7—Rounded Inside Bottom

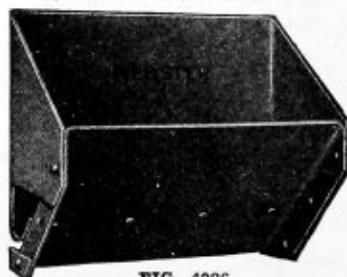


FIG. 4986

Styles Nos. 3 and 7—Capacities and Prices on Application.

CONTINUOUS STEEL ELEVATOR BUCKETS

Style No. 5

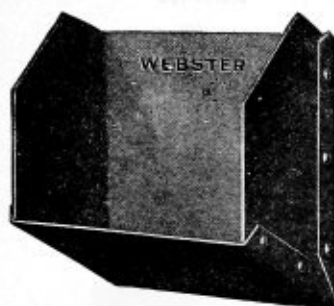


FIG. 4987

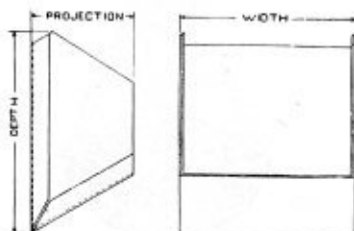


FIG. 4988

Capacities and Price Lists

Bucket Size, Inches			Capacity, Cu. Ft. per 100 Buckets	Price					
Width	Projec- tion	Depth		Thickness of Steel					
				16 Gauge	14 Gauge	12 Gauge	10 Gauge	$\frac{3}{16}$ Inch	$\frac{1}{4}$ Inch
9	6	9	6.77	\$0.90	\$1.05	\$1.60	.....	.....	.....
13	7	10	13.31	.....	1.45	2.10	\$2.55	.....	.....
16	8	11	21.26	.....	1.90	2.45	2.85	\$3.70	.....
18	9	12	30.42	.....	.....	2.85	3.35	4.25	\$5.35
24	10	13 $\frac{1}{2}$	50.16	.....	.....	.....	4.20	5.55	7.20
30	12	15	90.29	.....	.....	.....	7.83	9.45	12.00
36	13	16	132.50	.....	.....	.....	10.20	12.90	15.75

STEEL V-BUCKET ELEVATOR BUCKETS

Style No. 4



FIG. 4989

Style No. 6



FIG. 4990

V-Buckets are made in many sizes, for various materials and capacities. Styles Nos. 4 and 6 are the forms most used. Capacities and prices on application.

HAYWARD STANDARD ORANGE PEEL BUCKETS

No. A-837



FIG. 4991

No. A-794

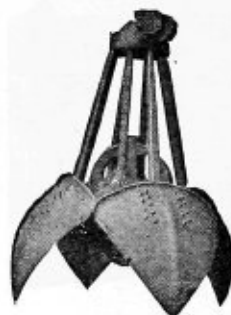


FIG. 4992

The Hayward Standard Orange Peel Bucket is built for all classes of dredging, excavating and rehandling, and will withstand the most severe usage.

The materials are of the very best quality. The blades and blade arms are of flange steel and the connecting rods, connecting the blades to the upper center, are forged from a solid bar of steel.

Every wearing part in a Hayward Bucket is furnished with replaceable bushings, bolts, etc.; furthermore, every part is interchangeable. This interchangeable feature exists only in Hayward Buckets. Replaceable outside cutting points or shoes are furnished on all Orange Peel Buckets. Inside points furnished when ordered. Outside power wheel shaft bearings are used on all buckets of 21 cubic feet capacity and larger.

Capacity Cu. Ft. and Cu. Yds.	Approximate Weight in Pounds	CLOSED		OPEN	
		Diameter	Height	Diameter	Height
2 cu. ft.	500	2' 2"	3' 7"	2' 9"	4' 0"
2½ cu. ft.	550	2' 7"	3' 10"	3' 2"	4' 4"
4 cu. ft.	950	3' 0"	4' 8"	3' 9"	5' 2"
5 cu. ft.	1000	3' 2"	4' 9"	3' 11"	5' 3"
7 cu. ft.	1100	3' 6"	5' 0"	4' 3"	5' 7"
9 cu. ft.	1200	3' 10"	5' 2"	4' 7"	5' 10"
12 cu. ft.	2200	4' 3"	6' 4"	5' 2"	7' 0"
15 cu. ft.	2350	4' 7"	6' 6"	5' 6"	7' 4"
21 cu. ft.	3800	5' 1"	7' 8"	6' 3"	8' 6"
1 cu. yd.	4200	5' 8"	8' 0"	6' 10"	9' 0"
1¼ cu. yd.	4600	6' 0"	8' 2"	7' 3"	9' 3"
1½ cu. yd.	5350	6' 4"	8' 5"	7' 8"	9' 6"
1¾ cu. yd.	7750	6' 4"	9' 6"	7' 10"	10' 6"
2 cu. yd.	8500	7' 0"	10' 0"	8' 6"	11' 3"
2½ cu. yd.	12500	8' 10"	11' 0"	10' 6"	12' 8"

HAYWARD CLASS "E" CLAM SHELL BUCKETS

WITH ORE BOWLS

No. A-719



FIG. 4993

No. A-720

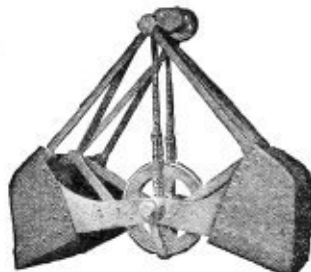


FIG. 4994

The Class "E" Hayward Clam Shell Bucket with Ore Bowl is constructed with a tray-like shell or bowl, called the Ore Bowl. In shape it resembles a shovel, which allows the material to slide more easily into the shell while closing. In proportion to size these buckets carry larger loads and are built to handle harder materials, such as crushed stone, broken slag, packed sand and ore. This type of bucket is now equipped with heavy, reinforced, bronze bushed steel bearings on the ends of the blade arms.

The adoption of manganese steel idler sheave and shroud removes practically all wear from the closing rope—one reason why rope lasts longer on a Hayward Bucket than any other bucket on the market. For excavating and digging these buckets can be fitted with steel teeth.

Bowl Capacity	Approximate Weight in Pounds	CLOSED			OPEN	
		Height	Length	Width	Height	Length
$\frac{1}{2}$ cu. yd.	2000	5' 2"	4' 1"	3' 4"	5' 8"	5' 11"
$\frac{3}{4}$ cu. yd.	2600	5' 10"	5' 0"	3' 4"	6' 8"	7' 1"
1 cu. yd.	2900	6' 8"	5' 7"	3' 4"	7' 4"	8' 3"
$1\frac{1}{4}$ cu. yd.	3200	6' 8"	5' 7"	3' 11"	7' 4"	8' 3"
$1\frac{1}{2}$ cu. yd.	4000	7' 4"	6' 2"	4' 2"	8' 3"	9' 0"
$1\frac{3}{4}$ cu. yd.	4200	7' 4"	6' 2"	4' 6"	8' 3"	9' 0"
2 cu. yd.	5000	7' 4"	6' 2"	5' 2"	8' 3"	9' 0"
$2\frac{1}{2}$ cu. yd.	5500	8' 6"	7' 0"	5' 3"	9' 7"	10' 0"
3 cu. yd.	6500	8' 6"	7' 0"	6' 0"	9' 7"	10' 0"

STANDARD SELF-DUMPING AND SELF-RIGHTING CONTRATORS' BUCKETS

CLASS "A" (FLARING SIDES)

FOR HANDLING STONE, SAND, CLAY, MORTAR, CONCRETE, ETC.

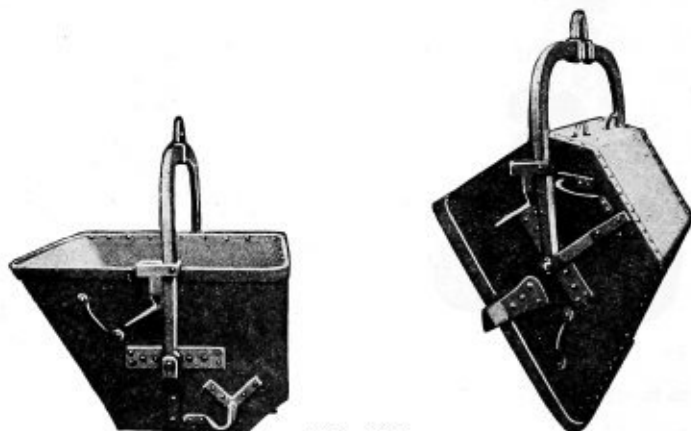


FIG. 4995

The top of the bucket is from eight to ten inches wider than the bottom, which permits the bucket to be quickly filled and the load cleanly and rapidly dumped.

It is simple in construction, easily handled, and well adapted for sinking shafts, sewer work and similar operations.

The bucket, although of greater first cost than the ordinary skip or other form of cheap bucket, is the cheapest in the long run, when durability with clean and quick dumping and the avoidance of delays caused by unwarranted breakage is considered.

We furnish these buckets of capacities and dimensions as tabulated below, but can vary the dimensions and retain the capacities given, to suit the purchaser.

We furnish the buckets of larger capacities and varying dimensions, to suit the requirements of any service.

Size No. of Bucket	Capacity in Cu. Ft.	Width Over All in Inches	Length in Inches	Depth in Inches	Approx. Weight of Bucket in Pounds	Price
86	3	30	26	15	175	\$ 25.00
87	4½	32	29	18	205	28.00
88	6	34	31	19	250	32.00
89	8	36	33	20	275	35.00
90	10	41	36	21½	320	40.00
91	12	44	40	23	390	45.00
92	14	46	42	25	420	55.00
93	21	48	47	28	560	75.00
94	27	53	50	31	750	90.00
95	36	65	58	33	900	110.00
96	42	66	59	34½	1030	120.00

ROUND BUCKETS

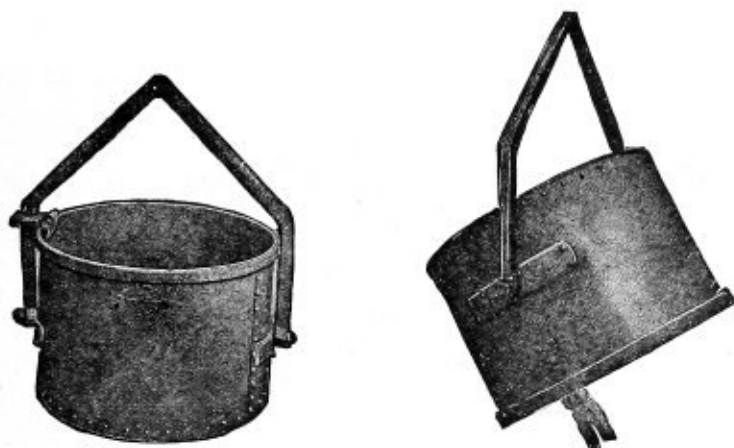


FIG. 4996

These buckets are used for handling all sorts of materials. They are built of steel and iron and the bottom is made of stock double the thickness of the sides, thereby equalizing the wear.

To secure stiffness and strength the bottom and sides are joined by an angle iron ring.

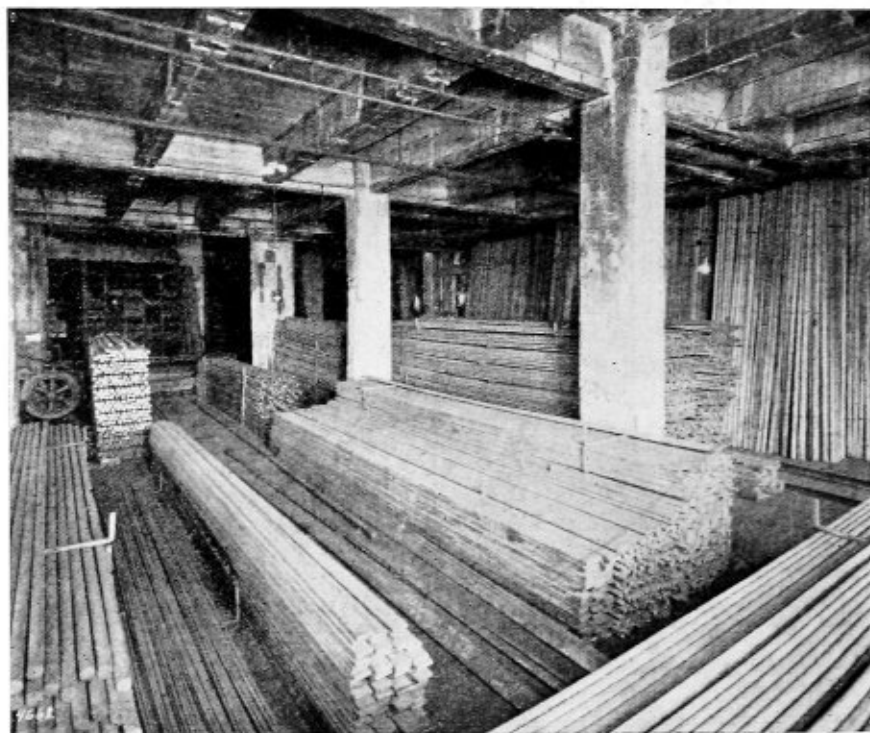
Regular sizes are shown in table below. For buckets of special size dimensions, etc., estimates will be furnished.

Size No. of Bucket	Coal Capacity in Lbs.	Capacity in Cu. Ft.	Width Over All in Inches	Height from Bottom of Bucket to Top of Bail	Depth of Bucket in Inches	Weight of Bucket in Lbs.	Price
134	300	6	31	37	21	180	\$20.00
135	400	8	34½	41	22	210	25.00
136	550	11	39	44	22	260	30.00
137	700	14	44	49	25	320	35.00
138	850	17	46½	51	26½	400	40.00
139	1050	21	48	56	30½	460	45.00
140	1350	27	50½	60	33½	560	55.00
141	2100	42	58½	71	40	800	75.00

STEEL AND IRON BARS,

ANGLES, CHANNELS AND BEAMS

TOOL STEEL SHAFTING



A partial view of our Iron and Steel Warehouse. When you need Steel Bars quickly test our service. We have a large stock of all sizes and kinds—Rounds, Flats, Squares, Half-Ovals, Angles, etc. Tons and Tons at your call.

STANDARD STEEL CLASSIFICATION

ADOPTED JULY 1, 1916

EXTRAS ARE GIVEN IN CENTS PER 100 POUNDS

ROUNDS TO 7½ IN. SQUARES TO 5 IN.

¾ to 3 ¹ / ₁₆ inches.....	Base	3 ¹ / ₁₆ inch	\$0.80	4 ¹ / ₈ to 4 ¹ / ₁₆ inches....	\$0.30
¾ to 1 ¹ / ₈ inches.....	\$0.10	¼ inch	1.00	4 ³ / ₈ to 5 ¹ / ₁₆ inches....	.40
½ to ¾ inches.....	.20	1 ¹ / ₈ inch	1.50	5 ¹ / ₈ to 5 ³ / ₁₆ inches....	.50
1 ¹ / ₁₆ inch	.40	3 ¹ / ₂ inch	2.00	5 ⁵ / ₈ to 6 ¹ / ₁₆ inches....	.75
¾ inch	.50	1 ¹ / ₂ inch	2.50	6 ¹ / ₈ to 6 ³ / ₁₆ inches....	1.00
1 ¹ / ₈ inch	.60	3 ³ / ₈ to 3 ⁵ / ₁₆ inches....	.15	6 ⁵ / ₈ to 7 ¹ / ₂ inches....	1.25
1 ¹ / ₂ inch	.70	3 ⁵ / ₈ to 4 ¹ / ₁₆ inches....	.25		

FLAT BARS AND HEAVY BANDS

1 to 6 in. x ¾ to 1 in.....	Base	½ x ¾ to 1 ¹ / ₁₆ in.....	\$1.00
1 to 6 in. x ¼ to 1 ¹ / ₈ in.....	\$0.20	½ x ¼ to 1 ¹ / ₈ in.....	1.20
1 ¹ / ₈ to 1 ¹ / ₂ in. x ¾ to ¾ in.....	.40	¾ x ¼ x 1 ¹ / ₈ in.....	2.00
1 ¹ / ₈ to 1 ¹ / ₂ in. x ¼ to 1 ¹ / ₈ in.....	.50	1 ¹ / ₈ to 6 in. x 1 ¹ / ₁₆ to 1 ¹ / ₈ in.....	.10
1 ¹ / ₂ to ¾ in. x ¾ to ½ in.....	.50	1 ¹ / ₈ to 6 in. x 1 ¹ / ₄ to 1 ¹ / ₂ in.....	.20
1 ¹ / ₂ to ¾ in. x ¼ to 1 ¹ / ₈ in.....	.70	1 ¹ / ₄ to 6 in. x 1 ¹ / ₈ to 2 ³ / ₄ in.....	.30
		3 ¹ / ₈ to 6 in. x 3 to 4 in.....	.40

LIGHT BARS AND BANDS

1½ to 6 in. x Nos. 7, 8, 9 and 1 ¹ / ₁₆ in.....	\$0.40
1½ to 6 in. x Nos. 10, 11, 12 and 1 ¹ / ₈ in.....	.60
1 to 1 ¹ / ₁₆ in. x Nos. 7, 8, 9 and 1 ¹ / ₈ in.....	.50
1 to 1 ¹ / ₁₆ in. x Nos. 10, 11, 12 and 1 ¹ / ₈ in.....	.70
1 ¹ / ₈ to 1 ¹ / ₂ in. x Nos. 7, 8, 9 and 1 ¹ / ₈ in.....	.70
1 ¹ / ₈ to 1 ¹ / ₂ in. x Nos. 10, 11, 12 and 1 ¹ / ₈ in.....	.80
1 ¹ / ₂ to ¾ in. x Nos. 7, 8, 9 and 1 ¹ / ₈ in.....	1.00
1 ¹ / ₂ to ¾ in. x Nos. 10, 11, 12 and 1 ¹ / ₈ in.....	1.20
1 ¹ / ₈ to ¾ in. x Nos. 7, 8, 9 and 1 ¹ / ₁₆ in.....	1.20
1 ¹ / ₈ to ¾ in. x Nos. 10, 11, 12 and 1 ¹ / ₈ in.....	1.30
½ in. x Nos. 7, 8, 9 and 1 ¹ / ₁₆ in.....	1.30
½ in. x Nos. 10, 11, 12 and 1 ¹ / ₈ in.....	1.50
1 ¹ / ₁₆ x 3 ¹ / ₂ in.....	1.80
¾ in. x Nos. 7, 8, 9 and 1 ¹ / ₈ in.....	1.90
¾ in. x Nos. 10 and 1 ¹ / ₈ in.....	2.40

For intermediate sizes, the next higher extra to be charged in all cases.

STANDARD STEEL CLASSIFICATION—CONTINUED

EXTRAS ARE GIVEN IN CENTS PER 100 POUNDS

HALF OVALS

$\frac{3}{8}$ to 4 in. x $\frac{3}{8}$ to $\frac{1}{2}$ in.	\$.50 extra
$2\frac{1}{2}$ x $\frac{5}{8}$ in. (special)	.50 extra
$\frac{3}{4}$ x $\frac{1}{4}$ in.	1.00 extra
$\frac{5}{8}$ x $\frac{3}{8}$ and $\frac{3}{8}$ in.	1.20 extra
$\frac{1}{2}$ x $\frac{3}{4}$ in.	1.60 extra
$\frac{1}{2}$ in. x No. 13	2.10 extra
$\frac{1}{2}$ x $\frac{1}{8}$ in.	1.60 extra
$\frac{1}{2}$ x $\frac{3}{4}$ in.	2.70 extra
$\frac{3}{8}$ x $\frac{3}{8}$ to $\frac{1}{2}$ in.	2.70 extra

HALF ROUNDS

1 to 2 in.	\$.40 extra
$\frac{3}{4}$ and $\frac{7}{8}$ in.	.70 extra
$\frac{5}{8}$ and $1\frac{1}{8}$ in.	1.00 extra
$\frac{1}{2}$ in.	1.40 extra
$\frac{3}{8}$ and $\frac{1}{4}$ in.	2.20 extra
$\frac{1}{8}$ in.	2.70 extra

ANGLES

$1\frac{1}{2}$ x $1\frac{1}{2}$ inches and wider, but under 3 inches, x $\frac{1}{8}$ inch and heavier	\$.20 extra
$1\frac{1}{2}$ x $1\frac{1}{2}$ inches and wider, but under 3 inches, x $\frac{1}{8}$ inch	.30 extra
1 x 1 to $1\frac{1}{4}$ inches x $\frac{1}{8}$ inch and heavier	.30 extra
1 x 1 to $1\frac{1}{4}$ x $1\frac{1}{4}$ inches x $\frac{1}{8}$ inch	.40 extra
$\frac{3}{8}$ x $\frac{3}{8}$ inch x $\frac{1}{8}$ inch	.40 extra
$\frac{3}{8}$ x $\frac{3}{8}$ inch x $\frac{1}{8}$ inch	.50 extra
$\frac{3}{4}$ x $\frac{3}{4}$ inch x $\frac{1}{8}$ inch	.50 extra
$\frac{3}{4}$ x $\frac{3}{4}$ inch x $\frac{1}{8}$ inch	.60 extra
3 inches on one or both legs by less than $\frac{1}{4}$ inch thick	.70 extra

Prices quoted on application for special sizes.

Angles with unequal legs will be billed at or the next higher extra of the mean dimensions.

OVALS

$\frac{3}{4}$ to $1\frac{1}{2}$ inches	\$.40 extra
$\frac{5}{8}$ inch	.70 extra
$\frac{1}{2}$ inch	1.10 extra
$\frac{1}{2}$ inch	1.40 extra

HEXAGONS

$\frac{3}{4}$ to $2\frac{5}{16}$ inches	\$.30 extra
$\frac{5}{8}$ to $1\frac{1}{8}$ inch	.50 extra
$\frac{1}{2}$ to $\frac{1}{2}$ inch	.70 extra
$\frac{1}{2}$ inch	1.10 extra
$\frac{3}{8}$ inch	1.30 extra
$\frac{1}{8}$ inch	1.50 extra

TEES

$1\frac{1}{2}$ x $1\frac{1}{2}$ inches and wider, but under 3 inches, x $\frac{1}{8}$ inch and heavier	\$.40 extra
1 x 1 to $1\frac{1}{4}$ x $1\frac{1}{4}$ inches x $\frac{1}{8}$ inch and heavier	.80 extra
1 x 1 to $1\frac{1}{4}$ x $1\frac{1}{4}$ inches x $\frac{1}{8}$ inch	1.00 extra
1 x 1 x $\frac{1}{8}$ inch Special Section T60	1.10 extra
Prices quoted on application for special sizes.	

CHANNELS

$1\frac{1}{2}$ inches and wider, but under 3 inches, x $\frac{1}{8}$ inch and heavier	\$.30 extra
$1\frac{1}{2}$ inches and wider, but under 3 inches, x $\frac{1}{8}$ inch	.50 extra
$1\frac{1}{2}$ x $1\frac{1}{2}$ inches x $\frac{1}{8}$ inch (special)	.60 extra
1 to $1\frac{1}{4}$ inches x $\frac{1}{8}$ inch and heavier	.50 extra
1 to $1\frac{1}{4}$ inches x $\frac{1}{8}$ inch	.70 extra
$\frac{3}{8}$ x $\frac{1}{8}$ inch and $\frac{1}{2}$	.80 extra
$\frac{3}{8}$ x $\frac{1}{8}$ inch	1.10 extra
$\frac{3}{4}$ x $\frac{1}{8}$ inch	.80 extra
$\frac{3}{4}$ x $\frac{1}{8}$ inch	1.10 extra
$\frac{5}{8}$ x $\frac{1}{8}$ inch	2.40 extra

For intermediate sizes, the next higher extra to be charged in all cases.

STEEL HOOP CLASSIFICATION

EXTRAS TO BE ADDED TO BASE PRICE

Width Inches	Thickness		Cents per 100 lbs. Extra	Width Inches	Thickness		Cents per 100 lbs. Extra
	Gage	Decimal			Gage	Decimal	
$\frac{3}{8}$	13	.095	\$1.10	$\frac{1}{16}$	13	.095	\$0.45
$\frac{3}{8}$	14	.083	1.10	$\frac{1}{16}$	14	.083	.45
$\frac{3}{8}$	15	.072	1.20	$\frac{1}{16}$	15	.072	.45
$\frac{3}{8}$	16	.065	1.30	$\frac{1}{16}$	16	.065	.55
$\frac{3}{8}$	17	.058	1.45	$\frac{1}{16}$	17	.058	.55
$\frac{3}{8}$	18	.049	1.60	$\frac{1}{16}$	18	.049	.60
$\frac{7}{16}$	13	.095	.90	$\frac{1}{16}$	19	.042	.65
$\frac{7}{16}$	14	.083	.90	$\frac{1}{16}$	20	.035	.75
$\frac{7}{16}$	15	.072	.90	$\frac{1}{16}$	21	.032	.90
$\frac{7}{16}$	16	.065	1.00	$\frac{1}{16}$	22	.028	1.05
$\frac{7}{16}$	17	.058	1.10	$\frac{1}{16}$	23	.025	1.25
$\frac{7}{16}$	18	.049	1.35	$\frac{3}{4}$ to $\frac{13}{16}$	13	.095	.40
$\frac{7}{16}$	19	.042	1.50	$\frac{3}{4}$ to $\frac{13}{16}$	14	.083	.40
$\frac{1}{2}$	13	.095	.65	$\frac{3}{4}$ to $\frac{13}{16}$	15	.072	.40
$\frac{1}{2}$	14	.083	.65	$\frac{3}{4}$ to $\frac{13}{16}$	16	.065	.50
$\frac{1}{2}$	15	.072	.65	$\frac{3}{4}$ to $\frac{13}{16}$	17	.058	.50
$\frac{1}{2}$	16	.065	.75	$\frac{3}{4}$ to $\frac{13}{16}$	18	.049	.55
$\frac{1}{2}$	17	.058	.75	$\frac{3}{4}$ to $\frac{13}{16}$	19	.042	.60
$\frac{1}{2}$	18	.049	.80	$\frac{3}{4}$ to $\frac{13}{16}$	20	.035	.65
$\frac{1}{2}$	19	.042	.85	$\frac{3}{4}$ to $\frac{13}{16}$	21	.032	.75
$\frac{1}{2}$	20	.035	.95	$\frac{3}{4}$ to $\frac{13}{16}$	22	.028	.95
$\frac{1}{2}$	21	.032	1.15	$\frac{3}{4}$ to $\frac{13}{16}$	23	.025	1.20
$\frac{1}{2}$	22	.028	1.35	$\frac{3}{4}$ to $\frac{13}{16}$	13	.095	.30
$\frac{9}{16}$	13	.095	.55	$\frac{3}{4}$ to $\frac{13}{16}$	14	.083	.30
$\frac{9}{16}$	14	.083	.55	$\frac{3}{4}$ to $\frac{13}{16}$	15	.072	.30
$\frac{9}{16}$	15	.072	.55	$\frac{3}{4}$ to $\frac{13}{16}$	16	.065	.35
$\frac{9}{16}$	16	.065	.65	$\frac{3}{4}$ to $\frac{13}{16}$	17	.058	.40
$\frac{9}{16}$	17	.058	.65	$\frac{3}{4}$ to $\frac{13}{16}$	18	.049	.40
$\frac{9}{16}$	18	.049	.70	$\frac{3}{4}$ to $\frac{13}{16}$	19	.042	.45
$\frac{9}{16}$	19	.042	.75	$\frac{3}{4}$ to $\frac{13}{16}$	20	.035	.55
$\frac{9}{16}$	20	.035	.85	$\frac{3}{4}$ to $\frac{13}{16}$	21	.032	.65
$\frac{9}{16}$	21	.032	1.00	$\frac{3}{4}$ to $\frac{13}{16}$	22	.028	.85
$\frac{9}{16}$	22	.028	1.15	$\frac{3}{4}$ to $\frac{13}{16}$	23	.025	1.10
$\frac{9}{16}$	23	.025	1.35	$\frac{15}{16}$ to 1	13	.095	.20
$\frac{5}{8}$	13	.095	.50	$\frac{15}{16}$ to 1	14	.083	.20
$\frac{5}{8}$	14	.083	.50	$\frac{15}{16}$ to 1	15	.072	.20
$\frac{5}{8}$	15	.072	.50	$\frac{15}{16}$ to 1	16	.065	.25
$\frac{5}{8}$	16	.065	.60	$\frac{15}{16}$ to 1	17	.058	.25
$\frac{5}{8}$	17	.058	.60	$\frac{15}{16}$ to 1	18	.049	.30
$\frac{5}{8}$	18	.049	.65	$\frac{15}{16}$ to 1	19	.042	.35
$\frac{5}{8}$	19	.042	.70	$\frac{15}{16}$ to 1	20	.035	.45
$\frac{5}{8}$	20	.035	.80	$\frac{15}{16}$ to 1	21	.032	.65
$\frac{5}{8}$	21	.032	.95	$\frac{15}{16}$ to 1	22	.028	.85
$\frac{5}{8}$	22	.028	1.10	$\frac{15}{16}$ to 1	23	.025	1.10
$\frac{5}{8}$	23	.025	1.30				

STEEL HOOP CLASSIFICATION

EXTRAS TO BE ADDED TO BASE PRICE

Width Inches	Thickness		Cents per 100 lbs. Extra	Width Inches	Thickness		Cents per 100 lbs. Extra
	Gage	Decimal			Gage	Decimal	
1 1/16 to 1 3/8	13	.095	\$0.15	2 3/16 to 3	18	.049	\$0.30
1 1/8 to 1 3/8	14	.083	.15	2 1/8 to 3	19	.042	.40
1 1/8 to 1 3/8	15	.072	.15	2 1/8 to 3	20	.035	.60
1 1/8 to 1 3/8	16	.065	.20	2 1/8 to 3	21	.032	1.00
1 1/8 to 1 3/8	17	.058	.25	3 1/8 to 3 1/2	13	.095	.10
1 1/8 to 1 3/8	18	.049	.25	3 1/8 to 3 1/2	14	.083	.15
1 1/8 to 1 3/8	19	.042	.30	3 1/8 to 3 1/2	15	.072	.20
1 1/8 to 1 3/8	20	.035	.45	3 1/8 to 3 1/2	16	.065	.30
1 1/8 to 1 3/8	21	.032	.65	3 1/8 to 3 1/2	17	.058	.40
1 1/8 to 1 3/8	22	.028	.85	3 1/8 to 3 1/2	18	.049	.55
1 1/8 to 2	13	.095	.10	3 1/8 to 3 1/2	19	.042	.75
1 1/8 to 2	14	.083	.10	3 1/8 to 3 1/2	20	.035	1.00
1 1/8 to 2	15	.072	.10	3 1/8 to 4	13	.095	.10
1 1/8 to 2	16	.065	.10	3 1/8 to 4	14	.083	.15
1 1/8 to 2	17	.058	.15	3 1/8 to 4	15	.072	.20
1 1/8 to 2	18	.049	.20	3 1/8 to 4	16	.065	.30
1 1/8 to 2	19	.042	.25	3 1/8 to 4	17	.058	.45
1 1/8 to 2	20	.035	.50	3 1/8 to 4	18	.049	.70
1 1/8 to 2	21	.032	.70	3 1/8 to 4	19	.042	.90
1 1/8 to 2	22	.028	.95	4 1/8 to 5	13	.095	.15
2 1/8 to 2 1/2	13	.095	.10	4 1/8 to 5	14	.083	.20
2 1/8 to 2 1/2	14	.083	.10	4 1/8 to 5	15	.072	.30
2 1/8 to 2 1/2	15	.072	.10	4 1/8 to 5	16	.065	.50
2 1/8 to 2 1/2	16	.065	.15	4 1/8 to 5	17	.058	.75
2 1/8 to 2 1/2	17	.058	.20	5 1/8 to 5 7/8	13	.095	.20
2 1/8 to 2 1/2	18	.049	.30	5 1/8 to 5 7/8	14	.083	.30
2 1/8 to 2 1/2	19	.042	.40	5 1/8 to 5 7/8	15	.072	.50
2 1/8 to 2 1/2	20	.035	.60	5 1/8 to 5 7/8	16	.065	.80
2 1/8 to 2 1/2	21	.032	.90	6 to 6 3/4	13	.095	.30
2 1/8 to 3	13	.095	.10	6 to 6 3/4	14	.085	.40
2 1/8 to 3	14	.083	.10	6 to 6 3/4	15	.072	.60
2 1/8 to 3	15	.072	.10	6 to 6 3/4	16	.065	.90
2 1/8 to 3	16	.065	.15	7 to 8 3/8	13	.095	.35
2 1/8 to 3	17	.058	.20	7 to 8 3/8	14	.083	.50

Prices are subject to change without notice.

Agreements are subject to strikes, accidents and other manufacturing contingencies.

Throughout this list the Birmingham Wire or English Standard Gage is used. Quality differentials will be charged for orders calling for less than 2,000 lbs. of a size.

Extras as follows will be charged for cutting to specified lengths:

	Net Per 100 Lbs.
13-Gage and lighter. For cutting to specified lengths not less than 24 inches...	\$0.05
For cutting to specified lengths 12 inches to 24 inches.....	.20
Extras for cutting to specified lengths less than 12 inches will be furnished on application.	
For rounding one end of cut hoop.....	\$0.05
For rounding both ends of cut hoop.....	.10
Exceptions—Extras for cutting and rounding one end will be waived on all widths when ordered in carload lots for cooperage purposes.	
For all intermediate gages the extra for the next lighter gage will be charged.	
Extras for slitting to width, flaring, pickling and galvanizing quoted on application.	

STANDARD STEEL CLASSIFICATION

EXTRAS ON STEEL TIRES

	Per 100 Lbs.
1x $\frac{1}{4}$ inch and heavier.....	Base
1 $\frac{1}{2}$ x $\frac{3}{8}$ and $\frac{3}{8}$ inch.....	\$0.20
1 to 1 $\frac{1}{2}$ x $\frac{3}{8}$ and $\frac{3}{8}$ inch.....	.30
1 to 1 $\frac{1}{2}$ x $\frac{1}{2}$ inch.....	.50
$\frac{3}{4}$ x $\frac{1}{2}$ and $\frac{1}{2}$ inch.....	.30
$\frac{3}{4}$ x $\frac{3}{8}$ and $\frac{3}{8}$ inch.....	.50
$\frac{3}{4}$ x $\frac{1}{2}$ and $\frac{3}{8}$ inch.....	.60
$\frac{3}{4}$ x $\frac{1}{4}$ inch.....	.30
$\frac{3}{4}$ x $\frac{3}{8}$ and $\frac{3}{8}$ inch.....	.80
$\frac{3}{4}$ x $\frac{1}{2}$ and $\frac{3}{8}$ inch.....	1.00
$\frac{5}{8}$ x $\frac{3}{8}$ inch.....	1.00
$\frac{5}{8}$ x $\frac{1}{2}$ and $\frac{3}{8}$ inch.....	1.10

For intermediate sizes, the next higher extra to be charged in all cases.

Sizes not shown are subject to special arrangement.

No extra charge for cutting to tire lengths.

CARBON EXTRAS

If specified up to 0.20 per cent.....	No extra
If specified 0.21 to 0.50 per cent.....	\$0.05 extra
If specified 0.51 per cent and over.....	.15 extra

QUANTITY DIFFERENTIALS

All specifications for less than 2,000 lbs. of a size will be subject to the following extras, the total weight of a size ordered to determine the extra, regardless of length and regardless of exact quantity actually shipped.

Quantities less than 2,000 lbs. but not less than 1,000 lbs.....	extra \$0.30
Quantities less than 1,000 lbs.	extra .70

STRAIGHTENING AND CENTERING

Machine straightening	extra \$0.20
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Extra for machine straightening and centering will be furnished upon application.

MACHINE CUTTING ROUNDS AND SQUARES
1 $\frac{1}{4}$ INCHES AND LARGER TO SPECIFIED LENGTHS

Machine cutting to lengths over 48 inches.....	extra \$0.30
Machine cutting to lengths over 24 inches to 48 inches, inclusive.....	extra .50
Machine cutting to lengths over 12 inches to 24 inches, inclusive.....	extra .70
Machine cutting to lengths of 12 inches and less, extra will be furnished on application, but will not be less than.....	.90

The above extras apply only to .50 Carbon and under. Extras for Machine Cutting over .50 Carbon will be furnished on application.

Extras for Machine Cutting Rounds and Squares under 1 $\frac{1}{4}$ inches, Flats, etc., will be furnished on application.

CUTTING TO SPECIFIED LENGTHS

Other than Machine Cutting

Cutting to lengths of 60 inches and over.....	No charge
Cutting to lengths over 48 inches to 59 inches, inclusive.....	extra \$0.10
Cutting to lengths over 24 inches to 48 inches, inclusive.....	extra .20
Cutting to lengths over 12 inches to 24 inches, inclusive.....	extra .40
Cutting to lengths of 12 inches and less, extra will be furnished on application, but will not be less than.....	.60

NATIONAL IRON CLASSIFICATION

ADOPTED JANUARY 6, 1896

ROUNDS AND SQUARES

		Per 100 lbs.			Per 100 lbs.
1	to 1 $\frac{1}{8}$ inches.....	Base	3 $\frac{1}{4}$	to 3 $\frac{1}{2}$ inch.....	extra \$0.10
2	" 2 $\frac{1}{8}$ "	extra, \$0.20	3 $\frac{1}{2}$	" 1 $\frac{1}{16}$ "	" .20
3	" 3 $\frac{1}{8}$ "	.50	4	" 1 $\frac{1}{8}$ "	" .30
3 $\frac{1}{2}$	" 4 "	.80	4 $\frac{1}{2}$	" 1 $\frac{3}{16}$ "	" .40
4 $\frac{1}{2}$	" 4 $\frac{1}{2}$ "	1.00	5	" 1 $\frac{1}{2}$ "	" .50
4 $\frac{3}{4}$	" 5 "	1.30	5 $\frac{1}{2}$	" 1 $\frac{3}{8}$ "	" .70
5 $\frac{1}{2}$	" 6 "	1.80	6	" 1 $\frac{1}{2}$ "	" .90
6 $\frac{1}{2}$	" 6 $\frac{1}{2}$ "	2.20	6 $\frac{3}{4}$	" 1 $\frac{3}{8}$ inch.....	" 1.40
6 $\frac{3}{4}$	" 7 $\frac{1}{4}$ "	2.50	7	" 1 $\frac{1}{2}$ "	" 2.50

FLATS

		Per 100 lbs.			Per 100 lbs.
1 $\frac{1}{2}$	to 4 by 3 $\frac{1}{8}$ to 1 inch.....	Base	8 $\frac{3}{4}$	to 10 by 1 $\frac{1}{8}$ to 1 $\frac{1}{2}$ in.....	extra \$0.90
4 $\frac{1}{2}$	" 6 " 1 "	extra \$0.10	8 $\frac{1}{4}$	" 10 " 1 $\frac{1}{8}$ " 2 "	" 1.00
4 $\frac{3}{4}$	" 6 " 1 $\frac{1}{8}$ " 1 $\frac{1}{2}$ "	.40	2	" 4 " 1 $\frac{1}{8}$ " 3 "	" .60
4 $\frac{1}{2}$	" 8 " 1 " 1 "	.60	4 $\frac{1}{2}$	" 6 " 1 $\frac{1}{8}$ " 3 "	" .80
6 $\frac{1}{4}$	" 8 " 1 $\frac{1}{8}$ " 1 $\frac{1}{2}$ "	.60	6 $\frac{1}{2}$	" 8 " 1 $\frac{1}{8}$ " 3 "	1.00
8 $\frac{1}{4}$	" 10 " 1 $\frac{1}{8}$ " 1 "	.80	1 $\frac{1}{8}$	" 1 $\frac{3}{8}$ " 3 " 1 "	" .10
1 $\frac{3}{8}$	" 4 " 1 $\frac{1}{8}$ " 1 $\frac{1}{2}$ "	.30	1	" 1 $\frac{1}{8}$ " 3 $\frac{1}{8}$ " 7 $\frac{1}{8}$ "	" .20
2	" 4 " 1 $\frac{1}{8}$ " 2 "	.50	3 $\frac{1}{2}$	" 1 $\frac{1}{8}$ " 3 $\frac{1}{8}$ " 8 "	" .40
4 $\frac{1}{2}$	" 6 " 1 $\frac{1}{8}$ " 2 "	.60	4 $\frac{1}{2}$	" 1 $\frac{1}{8}$ " 3 $\frac{1}{8}$ " 8 "	" .50
6 $\frac{1}{4}$	" 8 " 1 $\frac{1}{8}$ " 2 "	.80	1 $\frac{1}{2}$	" 3 $\frac{1}{8}$ " 3 $\frac{1}{8}$ " 1 $\frac{1}{2}$ "	" .90

OVAL IRON

		Per 100 lbs.			Per 100 lbs.
3 $\frac{1}{8}$	to 1 $\frac{1}{2}$ inches.....	extra \$0.40	3 $\frac{1}{8}$	to 3 $\frac{1}{8}$ inch.....	extra, \$1.10
3 $\frac{1}{4}$	" 1 $\frac{1}{8}$ "	.50	1 $\frac{1}{2}$	" 3 $\frac{1}{8}$ inch.....	" 1.00
3 $\frac{1}{2}$	" 1 $\frac{1}{8}$ "	.60	3 $\frac{1}{4}$	" 1 $\frac{1}{8}$ inch.....	" 1.20
1 $\frac{1}{2}$	" 3 $\frac{1}{8}$ "	.80			

HALF OVAL AND HALF ROUND

		Per 100 lbs.			Per 100 lbs.
2 $\frac{1}{4}$	to 3 inches.....	extra, \$0.60	1 $\frac{1}{2}$	to 3 $\frac{1}{8}$ inch.....	extra, \$1.20
2 $\frac{1}{2}$	" 2 "	.50	3 $\frac{1}{4}$	" 3 $\frac{1}{8}$ "	2.50
3 $\frac{1}{4}$	" 1 $\frac{1}{8}$ "	.70	3 $\frac{1}{2}$	" 3 $\frac{1}{8}$ inch.....	" 3.50
3 $\frac{1}{2}$	" 1 $\frac{1}{8}$ "	.90	1 $\frac{1}{4}$	" 3 $\frac{1}{8}$ "	" 4.50

Half oval, less than $\frac{3}{4}$ their width in thickness, extra price.

NORWAY AND SWEDISH IRON CLASSIFICATION

ROUNDS AND SQUARES

		Per 100 lbs.			Per 100 lbs.
1	to 1 $\frac{1}{8}$ inches.....	Base	3 $\frac{1}{8}$	to 3 $\frac{1}{2}$ inch.....	extra, \$0.30
2	" 2 $\frac{1}{8}$ "	extra, \$0.10	3 $\frac{1}{2}$	" 1 $\frac{1}{16}$ inch.....	" .40
2 $\frac{1}{2}$	" 3 $\frac{1}{8}$ "	.20	4	" 1 $\frac{1}{8}$ "	" .60
3 $\frac{1}{2}$	" 4 "	.50	4 $\frac{1}{2}$	" 1 $\frac{1}{8}$ "	" 1.00
4	" 3 $\frac{1}{8}$ inch.....	.10	5 $\frac{1}{2}$	" 1 $\frac{1}{8}$ "	" 3.00
4 $\frac{1}{2}$	" 5 $\frac{1}{8}$ "	.20			

FLATS

		Per 100 lbs.			Per 100 lbs.
1 $\frac{1}{2}$	to 4 by 3 $\frac{1}{8}$ to 1 in. thick.....	Base	1 $\frac{1}{2}$	to 6 by 1 $\frac{1}{4}$ and 5 $\frac{1}{16}$ in. thick, extra,	\$0.20
4 $\frac{1}{4}$	" 6 " 3 $\frac{1}{8}$ " 1 "	extra, \$0.10	1	to 1 $\frac{1}{8}$ by 1 $\frac{1}{4}$ " 5 $\frac{1}{16}$ "	" .30
1 $\frac{3}{4}$	" 6 " 1 $\frac{1}{8}$ " 1 $\frac{1}{2}$ in.	.20	3 $\frac{1}{4}$	and 3 $\frac{1}{8}$ by 1 $\frac{1}{4}$ and 5 $\frac{1}{16}$ in.	" .50
2 $\frac{1}{2}$	" 6 " 2 inches thick.....	.50	1 $\frac{1}{2}$	" 5 $\frac{1}{8}$ " 4 " 5 $\frac{1}{16}$ "	" 1.00
1 $\frac{3}{4}$	and 1 $\frac{1}{2}$ by 3 $\frac{1}{8}$ to 1 in. thick ..	.10	1	to 2 by 3 $\frac{1}{8}$ inch thick	" .50
1	" 1 $\frac{1}{2}$ " 5 $\frac{1}{8}$ " 7 $\frac{1}{8}$ "	.20	3 $\frac{1}{4}$	and 3 $\frac{1}{8}$ by 3 $\frac{1}{8}$ in.	" .80
1 $\frac{1}{2}$, 6 $\frac{1}{8}$, 3 $\frac{1}{4}$, and 3 $\frac{1}{8}$ by 3 $\frac{1}{8}$ to 5 $\frac{1}{8}$ inches thick.....		.40	1 $\frac{1}{2}$	" 6 " 3 $\frac{1}{8}$ "	" 1.20

IRON AND STEEL

WEIGHTS OF ROUND AND SQUARE IRON AND STEEL

PER LINEAL FOOT

Size, Inches	Round		Square		Size, Inches	Round		Square	
	Iron, Pounds	Steel, Pounds	Iron, Pounds	Steel, Pounds		Iron, Pounds	Steel, Pounds	Iron, Pounds	Steel, Pounds
$\frac{1}{4}$	.1653	.167	.2105	.212	$\frac{21}{4}$	13.39	13.52	17.05	17.22
$\frac{5}{16}$	.2583	.261	.3290	.333	$\frac{23}{8}$	14.92	15.07	19.00	19.18
$\frac{3}{8}$	.3720	.375	.4736	.478	$\frac{25}{8}$	16.53	16.69	21.05	21.25
$\frac{7}{16}$	.5063	.511	.6446	.651	$\frac{27}{8}$	18.23	18.40	23.21	23.43
$\frac{1}{2}$	.6613	.667	.8420	.850	$\frac{29}{8}$	20.01	20.20	25.47	25.60
$\frac{9}{16}$	.8370	.845	1.066	1.076	$\frac{31}{8}$	21.64	22.07	27.55	28.10
$\frac{5}{8}$	1.033	1.043	1.316	1.328	3	23.81	24.03	30.31	30.60
$\frac{11}{16}$	1.237	1.262	1.576	1.608	$\frac{31}{4}$	25.57	26.08	32.55	33.20
$\frac{3}{4}$	1.488	1.502	1.895	1.913	$\frac{33}{4}$	27.94	28.20	35.57	35.92
$\frac{13}{16}$	1.728	1.773	2.201	2.245	$\frac{35}{4}$	29.82	30.42	37.97	38.73
$\frac{7}{8}$	2.025	2.044	2.579	2.603	$\frac{37}{4}$	32.41	32.71	41.26	41.65
$\frac{15}{16}$	2.301	2.347	2.93	2.989	$\frac{39}{4}$	34.4	35.09	43.8	44.68
1	2.645	2.670	3.368	3.400	$\frac{41}{4}$	37.20	37.56	47.37	47.82
$1\frac{1}{8}$	3.348	3.379	4.263	4.303	4	42.33	42.73	53.89	54.40
$1\frac{1}{4}$	4.133	4.173	5.267	5.312	$4\frac{1}{4}$	47.29	48.24	60.21	61.41
$1\frac{3}{8}$	5.001	5.049	6.368	6.428	$4\frac{3}{4}$	53.57	54.07	.....	68.85
$1\frac{1}{2}$	5.952	6.008	7.578	7.650	$4\frac{1}{2}$	59.07	60.25	.....	76.71
$1\frac{3}{4}$	6.985	7.051	8.893	8.978	5	66.13	66.76	.....	85.00
$1\frac{7}{8}$	8.101	8.178	10.31	10.41	$5\frac{1}{4}$	72.16	73.60	.....	93.72
$1\frac{1}{2}$	9.300	9.388	11.84	11.95	$5\frac{1}{2}$	80.02	80.77	.....	102.8
2	10.58	10.68	13.47	13.60	$5\frac{3}{4}$	86.56	88.29	.....	112.4
$2\frac{1}{8}$	11.95	12.06	15.21	15.35	6	95.23	96.14	.....	122.4

WEIGHTS OF FLAT IRON

PER LINEAL FOOT IN POUNDS

Width, Inches	Thickness, Inches											
	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
1	.21	.42	.63	.84	1.05	1.26	1.47	1.68	2.11	2.53	.....	.....
$1\frac{1}{8}$	.24	.47	.71	.95	1.18	1.42	1.66	1.90	2.37	2.84	.....	.....
$1\frac{1}{4}$	.26	.53	.79	1.05	1.32	1.58	1.84	2.11	2.63	3.16	3.68	4.21
$1\frac{3}{8}$	.29	.58	.87	1.16	1.45	1.74	2.03	2.32	2.89	3.47	4.05	4.63
$1\frac{1}{2}$	.32	.63	.95	1.26	1.58	1.90	2.21	2.53	3.16	3.79	4.42	5.05
$1\frac{3}{4}$	.34	.68	1.03	1.37	1.71	2.05	2.39	2.74	3.42	4.11	4.79	5.47
$1\frac{7}{8}$	.37	.74	1.11	1.47	1.84	2.21	2.58	2.95	3.68	4.42	5.16	5.89
2	.42	.84	1.26	1.68	2.11	2.53	2.95	3.37	4.21	5.05	5.89	6.74
$2\frac{1}{8}$	.47	.95	1.42	1.90	2.37	2.84	3.32	3.79	4.74	5.68	6.83	7.58
$2\frac{1}{4}$	.53	1.05	1.58	2.11	2.63	3.16	3.68	4.21	5.26	6.32	7.37	8.42
$2\frac{3}{8}$	.58	1.16	1.74	2.32	2.89	3.47	4.05	4.63	5.79	6.95	8.10	9.26
3	.63	1.26	1.90	2.53	3.16	3.79	4.42	5.05	6.32	7.58	8.84	10.10
$3\frac{1}{8}$	.68	1.37	2.05	2.74	3.42	4.11	4.79	5.47	6.84	8.21	9.58	10.95
$3\frac{1}{4}$	.74	1.47	2.21	2.95	3.68	4.42	5.16	5.89	7.37	8.84	10.32	11.79
$3\frac{3}{8}$	.79	1.58	2.37	3.16	3.95	4.74	5.53	6.32	7.89	9.47	11.05	12.63
4	.84	1.68	2.53	3.37	4.21	5.05	5.89	6.74	8.42	10.10	11.79	13.47
$4\frac{1}{2}$	.95	1.90	2.84	3.79	4.74	5.68	6.63	7.58	9.47	11.38	13.26	15.16
5	1.05	2.11	3.16	4.21	5.26	6.32	7.37	8.42	10.53	12.63	14.74	16.84
$5\frac{1}{2}$	1.16	2.32	3.47	4.63	5.79	6.95	8.10	9.26	11.58	13.89	16.21	18.52
6	1.26	2.53	3.79	5.05	6.32	7.58	8.84	10.10	12.63	15.16	17.68	20.21
7	1.47	2.94	4.42	5.90	7.36	8.84	10.32	11.79	14.74	17.68	20.64	23.58
8	1.68	3.36	5.05	6.74	8.42	10.10	11.78	13.48	16.84	20.20	23.58	26.94

WEIGHTS AND DIMENSIONS OF STANDARD STEEL "I" BEAMS AND CHANNELS

Depth of Beam, In.	Weight per Foot Pounds	Area of Section Square Inches	Thickness of Web Inches	Width of Flange Inches	Depth of Beam, In.	Weight per Foot Pounds	Area of Section Square Inches	Thickness of Web Inches	Width of Flange Inches
3	5.5	1.63	.17	2.33	10	25.00	7.37	.31	4.66
3	6.5	1.91	.26	2.42	10	30.00	8.82	.45	4.80
3	7.5	2.21	.36	2.52	10	35.00	10.29	.60	4.95
4	7.5	2.21	.19	2.66	10	40.00	11.76	.75	5.10
4	8.5	2.50	.26	2.73	12	31.50	9.26	.35	5.00
4	9.5	2.79	.34	2.81	12	35.00	10.29	.44	5.09
4	10.5	3.09	.41	2.88	12	40.00	11.76	.46	5.25
5	9.75	2.87	.21	3.00	15	42.00	12.48	.41	5.50
5	12.25	3.60	.36	3.15	15	45.00	13.24	.46	5.55
5	14.75	4.34	.50	3.29	15	50.00	14.71	.56	5.65
6	12.25	3.61	.23	3.33	15	55.00	16.18	.66	5.75
6	14.75	4.34	.35	3.45	15	60.00	17.65	.59	6.00
7	17.25	5.07	.47	3.57	18	55.00	15.93	.46	6.00
7	15.00	4.42	.25	3.66	18	60.00	17.65	.56	6.10
7	17.50	5.15	.35	3.76	18	65.00	19.12	.64	6.18
7	20.00	5.88	.46	3.87	18	70.00	20.59	.72	6.26
8	18.00	5.33	.27	4.00	20	65.00	19.08	.50	6.25
8	20.50	5.96	.35	4.08	20	70.00	20.59	.58	6.33
8	23.00	6.69	.44	4.17	20	75.00	22.06	.65	6.40
8	25.50	7.43	.53	4.26	24	80.00	23.32	.50	7.00
9	21.00	6.31	.29	4.33	24	85.00	25.00	.57	7.07
9	25.00	7.35	.41	4.45	24	90.00	26.47	.63	7.13
9	30.00	8.82	.57	4.61	24	95.00	27.94	.69	7.19
9	35.00	10.29	.73	4.77	24	100.00	29.41	.75	7.25

WEIGHTS AND DIMENSIONS OF STANDARD CHANNELS

Depth of Channel, Inches	Weight per Foot Pounds	Area of Section Square Inches	Thickness of Web Inches	Width of Flange Inches	Depth of Channel, Inches	Weight per Foot Pounds	Area of Section Square Inches	Thickness of Web Inches	Width of Flange Inches
3	4.00	1.19	.17	1.410	8	21.25	6.25	.58	2.62
3	5.00	1.47	.26	1.504	9	13.25	3.89	.23	2.43
3	6.00	1.76	.36	1.602	9	15.00	4.41	.29	2.49
4	5.25	1.55	.18	1.580	9	20.00	5.88	.45	2.65
4	6.25	1.84	.25	1.652	9	25.00	7.35	.61	2.81
4	7.25	2.13	.33	1.725	10	15.00	4.46	.24	2.60
5	6.50	1.95	.19	1.750	10	20.00	5.88	.38	2.74
5	9.00	2.65	.33	1.890	10	25.00	7.35	.53	2.89
5	11.50	3.38	.48	2.037	10	30.00	8.82	.68	3.04
6	8.00	2.38	.20	1.920	10	35.00	10.29	.82	3.18
6	10.50	3.09	.32	2.038	12	20.50	6.03	.28	2.94
6	13.00	3.82	.44	2.160	12	25.00	7.35	.39	3.05
6	15.50	4.56	.56	2.283	12	30.00	8.82	.51	3.17
7	9.75	2.85	.21	2.090	12	35.00	10.29	.64	3.30
7	12.25	3.60	.32	2.198	12	40.00	11.76	.76	3.42
7	14.75	4.34	.42	2.303	15	33.00	9.90	.40	3.40
7	17.25	5.07	.53	2.408	15	35.00	10.29	.43	3.43
7	19.75	5.81	.63	2.513	15	40.00	11.76	.52	3.52
8	11.25	3.35	.22	2.260	15	45.00	13.24	.62	3.62
8	13.75	4.04	.31	2.347	15	50.00	14.71	.72	3.72
8	16.25	4.78	.40	2.439	15	55.00	16.18	.82	3.82
8	18.75	5.51	.49	2.530	..	.....	.....	...	....

CARBON TOOL STEEL

BLACK DIAMOND.....	base sizes, per lb. \$...
CRESCENT.....	base sizes, per lb.
FORT PITT.....	base sizes, per lb.
RED STAR.....	base sizes, per lb.
CORONA.....	base sizes, per lb.
CRESCENT EXTRA.....	base sizes, per lb.
CRESCENT SPECIAL.....	base sizes, per lb.

CARBON TOOL STEEL CLASSIFICATION

BASE SIZES, ROUND, SQUARE AND OCTAGON

 $\frac{5}{16}$ inch to 2 inches, inclusive

EXTRA SIZES, ROUND, SQUARE AND OCTAGON

All dimensions inclusive

$\frac{5}{16}$ to 2 inches.....	Base
$2\frac{1}{16}$ to 3 inches.....	extra per lb. 1.0 cents
$3\frac{1}{8}$ to 4 inches.....	extra per lb. 1.5 cents
$4\frac{1}{2}$ to 5 inches.....	extra per lb. 2.0 cents
$5\frac{1}{2}$ to 6 inches.....	extra per lb. 2.0 cents
$6\frac{1}{2}$ to 7 inches.....	extra per lb. 3.0 cents
$7\frac{1}{2}$ to 8 inches.....	extra per lb. 3.5 cents
$\frac{2}{16}$ to $\frac{1}{2}$ inch.....	extra per lb. 0.5 cents
$\frac{1}{16}$ to $\frac{3}{8}$ inch.....	extra per lb. 1.0 cents
$\frac{1}{16}$ and $\frac{1}{8}$ inch.....	extra per lb. 2.0 cents
$\frac{1}{8}$ and $\frac{3}{16}$ inch.....	extra per lb. 3.0 cents
$\frac{3}{16}$ inch.....	extra per lb. 5.0 cents
$\frac{1}{2}$ inch.....	extra per lb. 10.0 cents
$\frac{3}{4}$ inch.....	extra per lb. 18.0 cents

Intermediate sizes take next higher extra.

Annealing.....	extra per lb. $1\frac{1}{2}$ cents
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FLAT

 $\frac{1}{16}$ inch to 2 inches thick x $\frac{5}{16}$ inch to 2 inches wide

EXTRA SIZES, FLAT

$\frac{1}{8}$ x $\frac{1}{16}$ inch.....	extra per lb. 20.0c	$\frac{1}{8}$ x $\frac{3}{8}$ to $\frac{5}{8}$ inches....	extra per lb. 1.5c
$\frac{1}{8}$ x $\frac{1}{4}$ inch.....	extra per lb. 15.0c	$\frac{1}{8}$ x $\frac{1}{2}$ to 8 inches....	extra per lb. 1.0c
$\frac{1}{8}$ x $\frac{3}{8}$ inch.....	extra per lb. 8.0c	$\frac{3}{8}$ x $\frac{1}{2}$ to 8 inches....	extra per lb. 1.0c
$\frac{1}{8}$ x $\frac{1}{2}$ inch.....	extra per lb. 4.0c	$\frac{1}{2}$ x $\frac{1}{2}$ to 8 inches....	extra per lb. 1.0c
$\frac{1}{8}$ x $\frac{1}{2}$ to $\frac{1}{2}$ inch.....	extra per lb. 3.0c	$\frac{1}{2}$ x $\frac{1}{2}$ to 8 inches....	extra per lb. 1.0c
$\frac{1}{8}$ x $\frac{3}{4}$ to 7 inch.....	extra per lb. 2.0c	$\frac{1}{2}$ x $2\frac{1}{2}$ to 8 inches....	extra per lb. 1.0c
$\frac{1}{8}$ x $7\frac{1}{2}$ to 8 inches....	extra per lb. 3.0c	$\frac{3}{8}$ to 2 x $\frac{5}{8}$ to 2 in....	extra per lb. 0.0c
$\frac{1}{8}$ x $\frac{1}{4}$ inch.....	extra per lb. 5.0c	$\frac{5}{8}$ to 2 x $2\frac{1}{2}$ to 7 in....	extra per lb. 1.0c
$\frac{1}{8}$ x $\frac{3}{8}$ inch.....	extra per lb. 4.0c	$\frac{5}{8}$ to $1\frac{3}{4}$ x $7\frac{1}{2}$ to 8 in....	extra per lb. 1.0c
$\frac{1}{8}$ x $\frac{1}{2}$ inch.....	extra per lb. 3.0c	$1\frac{3}{8}$ to 2 x $7\frac{1}{2}$ to 8 in....	extra per lb. 1.5c
$\frac{1}{8}$ x $\frac{3}{4}$ to $\frac{5}{8}$ inch....	extra per lb. 2.0c	$2\frac{1}{8}$ to 3 x $2\frac{1}{8}$ to 5 in....	extra per lb. 1.0c
$\frac{1}{8}$ x $\frac{1}{2}$ to 2 inches....	extra per lb. 1.5c	$2\frac{1}{2}$ to 3 x $5\frac{1}{8}$ to 8 in....	extra per lb. 1.5c
$\frac{1}{8}$ x $2\frac{1}{2}$ to 7 inches....	extra per lb. 1.0c	$3\frac{1}{8}$ to 4 x $3\frac{1}{8}$ to 6 in....	extra per lb. 1.5c
$\frac{1}{8}$ x $7\frac{1}{2}$ to 8 inches....	extra per lb. 2.0c	$3\frac{1}{4}$ to 4 x $6\frac{1}{4}$ to 8 in....	extra per lb. 2.0c
$\frac{1}{4}$ x $\frac{5}{8}$ to $\frac{3}{4}$ inch....	extra per lb. 2.0c	$4\frac{1}{8}$ to 5 x $4\frac{1}{8}$ to 7 in....	extra per lb. 2.0c
$\frac{1}{4}$ x $\frac{1}{2}$ to $\frac{5}{8}$ inch....	extra per lb. 1.5c	$4\frac{1}{2}$ to 5 x $7\frac{1}{2}$ to 8 in....	extra per lb. 2.5c
$\frac{1}{4}$ x $\frac{1}{2}$ to 2 inches....	extra per lb. 1.5c	$5\frac{1}{4}$ to 6 x $5\frac{1}{4}$ to 8 in....	extra per lb. 2.5c
$\frac{1}{4}$ x $2\frac{1}{2}$ to 7 inches....	extra per lb. 1.0c	$6\frac{1}{4}$ to 7 x $6\frac{1}{4}$ to 7 in....	extra per lb. 3.0c
$\frac{1}{4}$ x $7\frac{1}{2}$ to 8 inches....	extra per lb. 2.0c	$6\frac{3}{8}$ to 8 x $7\frac{1}{2}$ to 8 in....	extra per lb. 3.5c

All dimensions inclusive. Intermediate sizes take the next higher extra.

CUTTING TO SPECIFIED SINGLE AND MULTIPLE LENGTHS

24 inches to 18 ft.....	per lb. 0.5c	12 to 18 inches.....	per lb. 1.5c
18 to 24 inches.....	per lb. 1.0c	6 to 12 inches.....	per lb. 2.0c

Less than 6 inches, special price. Over 18 feet, special price.

Annealing.....	extra per lb. $1\frac{1}{2}$ c
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HIGH SPEED STEEL

Standard classification of extras, all dimensions inclusive

Intermediate sizes take the next higher extra

BASE SIZES—ROUND, SQUARE AND OCTAGON

 $\frac{5}{8}$ inch to 2 inches, inclusive

FLAT

 $\frac{5}{8}$ inch to 2 inches thick by $\frac{5}{8}$ inch to 2 inches wide

EXTRA SIZES—ROUND, SQUARE AND OCTAGON

$\frac{3}{8}$ to $\frac{1}{2}$ in.....extra per lb.	\$0.02	$3\frac{3}{8}$ to 4 in.....extra per lb.	\$0.03 $\frac{1}{2}$
$\frac{1}{2}$ to $\frac{3}{4}$ in.....extra per lb.	.03 $\frac{1}{2}$	$4\frac{1}{8}$ to $4\frac{1}{2}$ in.....extra per lb.	.04
$\frac{3}{4}$ to $\frac{1}{2}$ in.....extra per lb.	.06	$4\frac{3}{8}$ to 5 in.....extra per lb.	.04 $\frac{1}{2}$
$\frac{1}{2}$ to $\frac{3}{4}$ in.....extra per lb.	.08 $\frac{1}{2}$	$5\frac{1}{8}$ to $5\frac{1}{2}$ in.....extra per lb.	.05
$2\frac{1}{8}$ to $2\frac{1}{2}$ in.....extra per lb.	.02	$5\frac{3}{8}$ to 6 in.....extra per lb.	.05 $\frac{1}{2}$
$2\frac{3}{8}$ to 3 in.....extra per lb.	.02 $\frac{1}{2}$	$6\frac{1}{8}$ to $6\frac{1}{2}$ in.....extra per lb.	.06
$3\frac{1}{8}$ to $3\frac{1}{2}$ in.....extra per lb.	.03	$6\frac{3}{8}$ to 7 in.....extra per lb.	.06 $\frac{1}{2}$
Annealing.....		extra per lb.	2c

EXTRA SIZES—FLAT

$\frac{1}{8}$ x $\frac{3}{8}$ inch.....extra per lb.	40.0c	$\frac{3}{8}$ x $1\frac{5}{8}$ to 5 inches.....extra per lb.	2.5c
$\frac{1}{8}$ x $\frac{1}{4}$ inch.....extra per lb.	30.0c	$\frac{1}{8}$ x $\frac{1}{2}$ to 1 inch.....extra per lb.	3.0c
$\frac{1}{8}$ x $\frac{3}{8}$ inch.....extra per lb.	20.0c	$\frac{1}{8}$ x $1\frac{1}{8}$ to $5\frac{1}{2}$ inches.....extra per lb.	2.5c
$\frac{1}{8}$ x $\frac{3}{4}$ to 2 inches.....extra per lb.	14.0c	$\frac{1}{8}$ x $\frac{5}{8}$ to 1 inch.....extra per lb.	2.5c
$\frac{1}{8}$ x $\frac{1}{4}$ to 3 inches.....extra per lb.	14.0c	$\frac{1}{8}$ x $1\frac{1}{8}$ to 6 inches.....extra per lb.	2.0c
$\frac{1}{8}$ x $\frac{3}{8}$ to $\frac{1}{2}$ inch.....extra per lb.	8.0c	$\frac{1}{8}$ x $\frac{5}{8}$ to 1 inch.....extra per lb.	2.5c
$\frac{1}{8}$ x $\frac{5}{8}$ to 1 inch.....extra per lb.	5.0c	$\frac{1}{8}$ x $1\frac{1}{8}$ to 6 inches.....extra per lb.	2.0c
$\frac{1}{8}$ x $1\frac{1}{8}$ to 4 inches.....extra per lb.	3.0c	$\frac{5}{8}$ to 2x $\frac{5}{8}$ to 2 in.....extra per lb.	0.0c
$\frac{1}{8}$ x $\frac{3}{4}$ to $\frac{5}{8}$ inch.....extra per lb.	5.0c	$\frac{5}{8}$ to 2x $2\frac{1}{8}$ to 4 in.....extra per lb.	2.0c
$\frac{1}{8}$ x $\frac{3}{4}$ to 1 inch.....extra per lb.	3.5c	$\frac{5}{8}$ to 2x $4\frac{1}{8}$ to 7 in.....extra per lb.	4.0c
$\frac{1}{8}$ x $1\frac{1}{8}$ to $4\frac{1}{2}$ inches.....extra per lb.	3.0c	$2\frac{1}{8}$ to 3x $2\frac{1}{8}$ to 4 in.....extra per lb.	2.0c
$\frac{3}{8}$ x $\frac{1}{2}$ to $\frac{3}{4}$ inches.....extra per lb.	3.0c	$2\frac{1}{8}$ to 3x $4\frac{1}{8}$ to 7 in.....extra per lb.	4.0c
$\frac{3}{8}$ x $\frac{5}{8}$ to $1\frac{1}{2}$ inches.....extra per lb.	3.0c		
Annealing.....		extra per lb.	2c

Bevels, same classifications as flats, plus 10c per lb. for shape.

CUTTING TO SPECIFIED SINGLE AND MULTIPLE LENGTHS

24 inches and over.....	per lb.	\$0.01
18 inches to 23 $\frac{1}{2}$ inches.....	per lb.	.02
12 inches to 17 $\frac{1}{2}$ inches.....	per lb.	.03
6 inches to 11 $\frac{1}{2}$ inches.....	per lb.	.04

Less than 6 inches, special price.

CRUCIBLE SPRING STEEL CLASSIFICATION

FLAT

1¼ to 4 inches x No. 4 gage to ½ inch, inclusive.....	Base
1 and 1½ inches x No. 1 gage to 4 gage.....	extra per lb. 0.2c
1 to 3 inches x No. 5 gage to 7 gage.....	extra per lb. 0.5c
¾ and 1½ inch x No. 1 gage to 7 gage.....	extra per lb. 0.5c
¾ to 1½ inch x No. 1 gage to 7 gage.....	extra per lb. 1.0c
¾ to 3 inches x No. 8 gage to 10 gage.....	extra per lb. 1.0c
¾ to 3 inches x No. 11 gage to 16 gage.....	extra per lb. 1.5c
¾ to 3 inches x No. 17 gage to 19 gage.....	extra per lb. 2.2c
¾ to 5½ inch x No. 10 gage to 16 gage.....	extra per lb. 4.0c
¾ to 5½ inch x No. 17 gage to 19 gage.....	extra per lb. 5.0c
Thinner than No. 19 gage, refer to sheet list.	

ROUND AND SQUARE

5/8 to 1½ inches, inclusive.....	Base
1/8 and 1/2 inch.....	extra per lb. 0.2c
1/8 and 3/8 inch.....	extra per lb. 0.5c
1/8 inch.....	extra per lb. 1.0c
1/4 inch.....	extra per lb. 1.5c
3/8 inch.....	extra per lb. 3.0c

All dimensions inclusive.

Cutting to lengths 24 inches and over, two-tenths cent per pound. Under 24 inches, special price.

Intermediate sizes take the next higher extra.

OPEN HEARTH SPRING STEEL

Base sizes.....per lb. \$...

Classification same as Crucible Spring Steel.

Cutting to lengths 24 inches and over, one-tenth cent per pound. Under 24 inches, special price.

QUANTITY DIFFERENTIALS

All specifications for less than 2,000 pounds of a size will be subject to the following extras, the total weight of a size ordered to determine the extra, regardless of length and regardless of extra quantity actually shipped.

Quantities less than 2,000 pounds, but not less than 1,000 pounds, three-tenths cent per pound extra. Quantities less than 1,000 pounds, seven-tenths cent per pound extra.

REINFORCING STEEL



FIG. 4997

Twisted Reinforcing Steel for concrete work carried in stock in large quantities and cut to length as ordered.

BLACK SHEETS



FIG. 4998

Finishes: One Pass Cold Rolled and Annealed
Two Pass Cold Rolled and Annealed
Three Pass Cold Rolled and Annealed
Blue Annealed Sheets

GALVANIZED SHEETS



FIG. 4999

STANDARD WEIGHTS AND THICKNESS OF SHEETS

U. S. Standard Gage for Sheets Established by Act of Congress, July, 1893

Gage	Black Thickness Fractions of Inch	Black Thickness Decimal Parts of Inch	Black Weight per Square Foot in Pounds	Galvanized Weight per Square Foot in Pounds	Galvanized Weight per Square Foot in Ounces
7	3-16	.1875	7.5	7.656	....
8	11-64	.171875	6.875	7.031	....
9	5-32	.15625	6.25	6.406	....
10	9-64	.140625	5.625	5.781	92½
11	1-8	.125	5	5.156	82½
12	7-64	.109375	4.375	4.531	72½
13	3-32	.09375	3.75	3.906	62½
14	5-64	.078125	3.125	3.281	52½
15	9-128	.0703125	2.8125	2.9685	47½
16	1-16	.0625	2.5	2.656	42½
17	9-160	.05625	2.25	2.406	38½
18	1-20	.05	2	2.156	34½
19	7-160	.04375	1.75	1.906	30½
20	3-80	.0375	1.50	1.656	26½
21	11-320	.034375	1.375	1.531	24½
22	1-32	.03125	1.25	1.405	22½
23	9-320	.028125	1.125	1.281	20½
24	1-40	.025	1	1.156	18½
25	7-320	.021875	.875	1.031	16½
26	3-160	.01875	.75	.906	14½
27	11-640	.0171875	.6875	.8435	13½
28	1-64	.015625	.625	.781	12½
29	9-640	.0140625	.5625	.7185	11½
30	1-80	.0125	.5	.656	10½

**PRICE DIFFERENTIALS AND EXTRAS
BESSEMER AND OPEN HEARTH STEEL
GAGE DIFFERENTIALS**

BLACK		Per Cwt.	GALVANIZED		Per Cwt.
Gage			Gage		
30 Add	.....	\$0.20	30 Add	.....	\$0.50
29 Add	.....	.10	29 Add	.....	.25
28 Add	.....	Base	28 Add	.....	Base
27 Deduct	.....	.05	27 Deduct	.....	.15
25-26 Deduct	.....	.10	25-26 Deduct	.....	.30
22-24 Deduct	.....	.15	22-24 Deduct	.....	.45
17-21 Deduct	.....	.20	17-21 Deduct	.....	.60
15-16 Deduct	.....	.25	15-16 Deduct	.....	.75
13-14 Deduct	.....	.30	12-14 Deduct	.....	.90
10-12 Deduct	.....	.35	10-11 Deduct	.....	1.00
BLUE ANNEALED			STANDARD SIZES		
Gage					Per Cwt.
8 and Heavier deduct	.....				\$0.05
9-10	.....				Base
11-12 Add	.....	.05			.05
13-14 Add	.....	.10			.10
15-16 Add	.....	.20			.20
FINISHES		Per Cwt.	Gages Nos. 12 to 30, inclusive, 24, 26, 28 and 30 inches wide, by 72, 84, 96 and 120 inches long. Gage Nos. 14 to 28, inclusive, 36 inches wide by 96 and 120 inches long. All sizes other than standard when specified less than 4,000 pounds quantity, of one gage and size, command an extra of 10 cents per hundred pounds.		
Full cold rolled and annealed	.....	\$0.15			
Blue stove pipe stock	.....	.15			
Oiling	.....	.10			
Lime finish	.....	.10			
Deoxidizing	.....	.15			
Roller leveling	.....	.10			
Patent or Stretcher Leveling	.....	.25			
Boxing and crating	.....	On appl.			
Resquaring	.....	.5% of gage price			
after quality, size and gage extras are added.					

EXTRAS FOR SIZE—WIDTH

Gage and Finish	Over		Over		Over		Under		Under		Under		Under	
	32-36	36-40	40-44	44-48	24-26	26-15	15-12	12-9	9-6	9-6	9-6	9-6	9-6	9-6
Black and Blue Annealed.														
16 and heavier	.00	.00	.00	.00	.10	.10	.10	.15	.15					
17 and 18	.00	.05	.05	.05	.10	.10	.10	.15	.15					
19 to 21	.00	.15	.15	.25	.10	.10	.10	.20	.20					
22 to 24	.00	.20	.40	.40	.10	.10	.10	.20	.20					
25 to 27	.00	.20	.40	...	.10	.10	.10	.20	.20					
28	.10	.40	...	...	.10	.10	.10	.20	.20					
29 and 30	.10	...	...	...	.10	.10	.10	.20	.20					
Galvanized.														
10 to 15	.00	.00	.10	.20	.15	.15	.15	.25	.25					
16 to 18	.00	.10	.10	.20	.15	.15	.15	.25	.25					
19 to 21	.00	.20	.30	.40	.15	.15	.15	.25	.25					
22 to 24	.00	.20	.40	.60	.15	.15	.15	.25	.25					
25 and 26	.00	.30	.60	...	.20	.20	.20	.35	.35					
27	.10	.50	.75	...	.20	.20	.20	.35	.35					
28	.20	.60	...	...	.20	.20	.20	.35	.35					
29 and 30	.20	...	...	...	.20	.20	.20	.35	.35					

LENGTH

	Under		Under		Under		Under		Over		Over	
	60-48	48-40	40-30	30-18	120-132	132-144	120-132	132-144	120-132	132-144	120-132	132-144
Black or Galvanized.												
16 and heavier	.05	.05	.05	.10	.00	.00						
17 and 18	.05	.05	.05	.10	.05	.10						
19 and lighter	.10	.10	.10	.20	.10	.10						

BLACK SHEETS, STANDARD SIZES

WEIGHTS PER SHEET AND BUNDLE

Gages	14			16			18			20			22		
Size of Sheet	Wt. per Sht.	Wt. per Bdl.	Shts per Bdl.	Wt. per Sht.	Wt. per Bdl.	Shts per Bdl.	Wt. per Sht.	Wt. per Bdl.	Shts per Bdl.	Wt. per Sht.	Wt. per Bdl.	Shts per Bdl.	Wt. per Sht.	Wt. per Bdl.	Shts per Bdl.
24x72	37.5	150	4	39.0	150	5	24.0	144	6	18.0	144	8	15.0	150	10
26x72	49.63	162	4	32.4	162	5	26.0	156	6	19.5	156	8	16.3	146	9
28x72	43.8	131	3	35.0	140	4	28.0	140	5	21.0	147	7	17.5	140	8
30x72	46.9	141	3	37.5	150	4	30.0	150	5	22.5	157	7	18.8	150	8
36x72	56.2	169	3	45.0	135	3	36.0	144	4	27.0	135	5	22.5	157	7
24x84	43.8	131	3	35.0	140	4	28.0	140	5	21.0	147	7	17.5	140	8
26x84	47.4	142	3	38.0	152	4	30.3	152	5	22.8	159	7	19.0	152	8
28x84	51.0	153	3	40.8	163	4	32.7	163	5	24.5	147	6	20.4	143	7
30x84	54.7	164	3	43.8	131	3	35.0	140	4	26.3	157	6	21.3	153	7
36x84	65.6	131	2	52.5	157	3	42.0	168	4	31.5	157	5	26.3	157	6
24x96	50.0	150	3	40.0	160	4	32.0	160	5	24.0	144	6	20.0	140	7
26x96	54.2	162	3	43.3	130	4	34.7	139	4	26.0	156	6	21.7	152	7
28x96	58.3	175	3	46.7	140	3	37.3	149	4	28.0	140	5	23.3	140	6
30x96	62.5	125	2	50.0	150	3	40.0	160	4	30.0	150	5	25.0	150	6
36x96	75.0	150	2	60.0	120	2	48.0	144	3	36.0	144	4	30.0	150	5
24x120	62.5	125	2	50.0	150	3	40.0	160	4	30.0	150	5	25.0	150	6
26x120	67.7	135	2	54.2	162	3	43.3	130	4	32.5	162	5	27.1	162	6
28x120	73.0	146	2	58.0	175	3	46.7	140	3	35.0	140	4	29.2	146	5
30x120	78.0	156	2	62.5	125	2	50.0	150	3	37.5	150	4	31.3	156	5
36x120	93.8	187	2	75.0	150	2	60.0	120	2	45.0	135	3	37.5	150	4

Gages	24			26			27			28			20		
Size of Sheet	Wt. per Sht.	Wt. per Bdl.	Shts per Bdl.	Wt. per Sht.	Wt. per Bdl.	Shts per Bdl.	Wt. per Sht.	Wt. per Bdl.	Shts per Bdl.	Wt. per Sht.	Wt. per Bdl.	Shts per Bdl.	Wt. per Sht.	Wt. per Bdl.	Shts per Bdl.
24x72	12.0	144	12	9.0	144	16	8.3	148	18	7.5	150	20	6.0	150	25
26x72	13.0	143	11	9.8	146	15	8.9	143	16	8.1	146	18	5.5	149	23
28x72	14.0	154	11	10.5	147	14	9.6	151	16	9.8	149	17	7.0	147	21
30x72	15.0	150	10	11.3	146	13	10.3	144	14	9.4	150	16	7.5	150	20
36x72	18.0	144	8	13.5	148	11	12.4	148	12	11.3	146	13	9.0	144	16
24x84	11.0	154	11	10.5	147	14	9.7	144	15	8.8	149	17	7.0	147	21
26x84	15.2	152	10	11.4	148	13	10.4	146	14	9.5	152	16	7.6	144	19
28x84	16.3	147	9	12.3	147	12	11.2	146	13	10.2	143	14	8.2	155	19
30x84	17.5	140	8	13.1	144	11	12.0	144	12	10.9	153	14	8.8	149	17
36x84	21.0	147	7	15.8	142	9	14.4	144	10	13.1	144	11	10.5	147	14
24x96	16.0	144	9	12.0	144	12	11.0	143	13	10.0	150	15	8.0	144	18
26x96	17.3	156	9	13.0	143	11	11.9	143	12	10.8	152	14	8.7	147	17
28x96	18.7	149	8	14.0	154	11	12.9	154	12	11.7	152	13	9.3	149	16
30x96	20.0	140	7	15.0	150	10	13.8	151	11	12.5	150	12	10.0	150	15
36x96	24.0	144	6	18.0	144	8	16.5	148	9	15.0	150	10	12.0	144	12
24x101	16.8	151	9	12.6	151	12	11.5	139	12	10.5	147	14	.....	.....	.....
26x101	18.2	146	8	13.6	150	11	12.5	150	12	11.4	148	13	.....	.....	.....
28x101	19.6	157	8	14.7	147	10	13.5	148	11	12.2	147	12	.....	.....	.....
30x101	21.0	147	7	15.7	142	9	14.4	145	10	13.1	145	11	.....	.....	.....
36x101	25.2	151	6	18.9	151	8	17.3	156	9	15.7	142	9	.....	.....	.....
24x120	20.0	140	7	15.0	150	10	13.8	151	11	12.5	150	12	10.0	150	15
26x120	21.7	152	7	16.3	146	9	14.9	149	10	13.6	149	11	10.9	152	14
28x120	23.3	140	6	17.5	140	8	16.0	144	9	14.6	146	10	11.7	163	14
30x120	25.0	150	6	18.8	150	8	17.2	155	9	15.7	156	10	12.5	150	12
36x120	30.0	150	5	22.5	157	7	20.6	165	8	18.8	150	8	15.0	150	10

GALVANIZED SHEETS, STANDARD SIZES

AVERAGE WEIGHT PER SHEET AND PER BUNDLE IN POUNDS

Gages	12	14	16	18	20	22
SIZE OF SHEET	Wt. per Sheet	Wt. per Bol.	No. Sheets	Wt. per Sheet	Wt. per Bol.	No. Sheets
24x120	54.33	163	39.3	33.1	159	16.9
24x84	58.91	177	42.6	34.5	161	18.3
24x48	63.44	127	45.9	37.1	149	19.7
30x120	67.97	136	49.2	39.8	159	21.1
30x84	71.56	163	59.1	47.8	149	25.3
24x84	63.44	127	45.9	37.1	149	19.7
24x48	68.69	137	49.7	40.3	161	21.3
28x84	74.00	148	53.5	43.4	171	23.9
30x84	79.30	159	57.4	46.5	139	26.0
36x84	95.16	190	68.9	55.8	167	34.8
24x96	72.50	145	52.5	42.5	170	24.6
24x60	78.53	157	56.8	46.0	138	27.4
28x96	84.55	169	61.2	49.6	149	30.9
30x96	90.62	181	65.6	53.1	159	33.1
36x96	108.75	109	78.7	63.7	127	39.8
24x120	90.62	181	65.6	53.1	159	33.1
26x120	98.15	196	71.1	57.5	173	35.9
28x120	105.71	211	76.5	62.0	186	38.6
30x120	113.28	113	82.0	66.4	133	41.4
36x120	135.94	136	98.4	79.7	159	49.7
Gages	24	26	28	30	32	36
SIZE OF SHEET	Wt. per Sheet	Wt. per Bol.	No. Sheets	Wt. per Sheet	Wt. per Bol.	No. Sheets
24x120	13.9	153	11	16.9	152	14
24x84	15.0	150	10	18.8	154	13
24x48	16.3	146	9	21.7	152	12
30x120	17.3	156	9	23.7	152	12
30x84	19.8	146	7	26.3	147	10
24x84	16.3	146	9	21.7	152	12
24x48	17.3	140	8	23.7	151	11
28x84	18.9	151	8	26.3	148	10
30x84	20.4	142	7	28.9	159	10
36x84	24.3	146	6	33.0	152	8
24x96	15.5	148	8	21.5	145	10
24x60	20.0	160	8	25.7	157	10
28x96	21.6	151	7	28.9	152	9
30x96	23.1	162	7	31.1	145	8
36x96	27.8	166	6	37.0	152	7
24x120	23.1	162	7	28.9	152	9
26x120	25.0	150	6	31.1	146	8
28x120	27.0	162	6	33.0	148	7
30x120	28.9	145	5	37.0	159	6
36x120	34.7	173	5	42.6	163	6
24x120	13.9	153	11	16.9	152	14
24x84	15.0	150	10	18.8	154	13
24x48	16.3	146	9	21.7	152	12
30x120	17.3	156	9	23.7	152	12
30x84	19.8	146	7	26.3	147	10
24x84	16.3	146	9	21.7	152	12
24x48	17.3	140	8	23.7	151	11
28x84	18.9	151	8	26.3	148	10
30x84	20.4	142	7	28.9	159	10
36x84	24.3	146	6	33.0	152	8
24x96	15.5	148	8	21.5	145	10
24x60	20.0	160	8	25.7	157	10
28x96	21.6	151	7	28.9	152	9
30x96	23.1	162	7	31.1	145	8
36x96	27.8	166	6	37.0	152	7
24x120	23.1	162	7	28.9	152	9
26x120	25.0	150	6	31.1	146	8
28x120	27.0	162	6	33.0	148	7
30x120	28.9	145	5	37.0	159	6
36x120	34.7	173	5	42.6	163	6

COMPARATIVE TABLE OF GAGES

Gage	Brown & Sharp and American	Swiss Steel Wire	Swiss Iron Wire Birmingham and English	Old English and London	British Imperial	Wahlbourn & Moore Steel Wire	Wahlbourn & Moore Iron Wire	United States Steel & Plate Steel & Iron	Mathieson & Foster Sheet Zinc
0000	.460		.454	.454	.400	.011	.3938	.40625	$\frac{1}{16}$ 0156
000	.40964		.425	.425	.372	.012	.3625	.375	$\frac{1}{16}$ 0313
00	.36480		.380	.380	.348	.0133	.3310	.34375	$\frac{1}{16}$ 0499
0	.32486		.340	.340	.324	.0144	.3065	.3125	$\frac{1}{16}$ 0625
1	.28930	.227	.300	.300	.300	.0156	.2830	.28125	$\frac{1}{16}$ 0781
2	.25763	.219	.284	.284	.276	.0166	.2625	.26563	$\frac{1}{16}$ 0938
3	.22942	.212	.259	.259	.252	.0178	.2437	.25	$\frac{1}{16}$ 1094
4	.20431	.207	.238	.238	.232	.0188	.2253	.23438	$\frac{1}{16}$ 125
5	.18194	.204	.220	.220	.212	.0202	.207	.21875	$\frac{1}{16}$ 1406
6	.16202	.201	.203	.203	.192	.0215	.192	.20313	$\frac{1}{16}$ 1563
7	.14428	.199	.180	.180	.176	.023	.177	.1875	$\frac{1}{16}$ 1719
8	.12849	.197	.165	.165	.160	.0243	.162	.17188	$\frac{1}{16}$ 1875
9	.11443	.194	.148	.148	.144	.0256	.1483	.15625	$\frac{1}{16}$ 2031
10	.10189	.191	.134	.134	.128	.027	.135	.14063	$\frac{1}{16}$ 2188
11	.09074	.188	.120	.120	.116	.0284	.1205	.125	$\frac{1}{16}$ 2344
12	.08081	.185	.109	.109	.104	.0296	.1055	.10938	$\frac{1}{16}$ 250
13	.07196	.182	.095	.095	.092	.0314	.0915	.09375	$\frac{1}{16}$ 2656
14	.06408	.180	.083	.083	.080	.0326	.090	.07813	$\frac{1}{16}$ 2813
15	.05707	.178	.072	.072	.072	.0345	.072	.07031	$\frac{1}{16}$ 2969
16	.05082	.175	.065	.065	.064	.036	.0625	.0625	$\frac{1}{16}$ 3125
17	.04525	.172	.058	.058	.056	.0377	.054	.05625	$\frac{1}{16}$ 3281
18	.04030	.168	.049	.049	.048	.0395	.0475	.05	$\frac{1}{16}$ 3438
19	.03589	.164	.042	.040	.040	.0414	.041	.04375	$\frac{1}{16}$ 3594
20	.03196	.161	.035	.035	.036	.0434	.0348	.0375	$\frac{1}{16}$ 375
21	.02846	.157	.033	.0315	.032	.046	.0317	.03438	$\frac{1}{16}$ 3906
22	.02535	.155	.028	.0295	.028	.0483	.0286	.03125	$\frac{1}{16}$ 4063
23	.02257	.153	.025	.027	.024	.051	.0258	.02813	$\frac{1}{16}$ 4219
24	.0201	.151	.022	.025	.022	.055	.023	.025	$\frac{1}{16}$ 4375
25	.0179	.148	.020	.023	.020	.0586	.0204	.02188	$\frac{1}{16}$ 4531
26	.01594	.146	.018	.0205	.018	.0626	.0181	.01875	$\frac{1}{16}$ 4688
27	.01420	.143	.016	.01875	.0164	.0658	.0173	.01719	$\frac{1}{16}$ 4844
28	.01264	.139	.014	.0165	.0148	.072	.0162	.01563	$\frac{1}{16}$ 500
29	.01126	.134	.013	.0155	.0136	.076	.015	.01406	$\frac{1}{16}$ 5156
30	.01003	.127	.012	.01375	.0124	.080	.014	.0125	$\frac{1}{16}$ 5313
31	.00893	.120	.010	.01225	.0116		.0132	.01094	$\frac{1}{16}$ 5469
32	.00795	.115	.009	.01125	.0108		.0128	.01016	$\frac{1}{16}$ 5625
33	.00708	.112	.008	.01025	.0100		.0118	.00938	$\frac{1}{16}$ 5781
34	.0063	.110	.007	.0095	.0092		.0104	.00859	$\frac{1}{16}$ 5938
35	.00561	.104	.005	.009	.0084		.0095	.00781	$\frac{1}{16}$ 6094
36	.005	.108	.004	.0075	.0076		.009	.00703	$\frac{1}{16}$ 625
37	.00445	.103		.0065	.0068		.0085	.00664	$\frac{1}{16}$ 6406
38	.00397	.101		.00575	.0060		.008	.00625	$\frac{1}{16}$ 6563
39	.00353	.099		.005	.0052		.0075		$\frac{1}{16}$ 6719
40	.00314	.097		.0045	.0048		.007		$\frac{1}{16}$ 6875

METRIC EQUIVALENTS

1 Metre = 1000 M/m	= 39.3704 In.	1" = 25.4	M/m
1 K/m = 1000 M	= 3280.8693 Ft.	1/4" = 6.35	"
1 Sq. M = 1 Centare	= 1550 Sq. In.	1/8" = 3.175	"
100 Sq. M = 1 Are	= 1076.4 Sq. Ft.	1/32" = .7937	"
10000 Sq. M = 1 Hectare	= 2.471 Acres	1/64" = .3968	"
1 Kgm. = 2.2 lbs. av.		1/100" = .254	"

$\frac{1}{16}$	0156
$\frac{1}{8}$	0313
$\frac{3}{16}$	0499
$\frac{1}{4}$	0625
$\frac{5}{16}$	0781
$\frac{3}{8}$	0938
$\frac{7}{16}$	1094
$\frac{1}{2}$	125
$\frac{9}{16}$	1406
$\frac{5}{8}$	1563
$\frac{11}{16}$	1719
$\frac{3}{4}$	1875
$\frac{13}{16}$	2031
$\frac{7}{8}$	2188
$\frac{15}{16}$	2344
1	250
$\frac{1}{16}$	2656
$\frac{1}{8}$	2813
$\frac{3}{16}$	2969
$\frac{1}{4}$	3125
$\frac{5}{16}$	3281
$\frac{3}{8}$	3438
$\frac{7}{16}$	3594
$\frac{1}{2}$	375
$\frac{9}{16}$	3906
$\frac{5}{8}$	4063
$\frac{11}{16}$	4219
$\frac{3}{4}$	4375
$\frac{13}{16}$	4531
$\frac{7}{8}$	4688
1	4844
$\frac{1}{16}$	500
$\frac{1}{8}$	5156
$\frac{3}{16}$	5313
$\frac{1}{4}$	5469
$\frac{5}{16}$	5625
$\frac{3}{8}$	5781
$\frac{7}{16}$	5938
$\frac{1}{2}$	6094
$\frac{9}{16}$	625
$\frac{5}{8}$	6406
$\frac{11}{16}$	6563
$\frac{3}{4}$	6719
$\frac{13}{16}$	6875
$\frac{7}{8}$	7031
1	7188
$\frac{1}{16}$	7344
$\frac{1}{8}$	750
$\frac{3}{16}$	7656
$\frac{1}{4}$	7813
$\frac{5}{16}$	7969
$\frac{3}{8}$	8125
$\frac{7}{16}$	8281
$\frac{1}{2}$	8438
$\frac{9}{16}$	8594
$\frac{5}{8}$	875
$\frac{11}{16}$	8906
$\frac{3}{4}$	9063
$\frac{13}{16}$	9219
$\frac{7}{8}$	9375
1	9531
$\frac{1}{16}$	9688
$\frac{1}{8}$	9844

SHEET COPPER

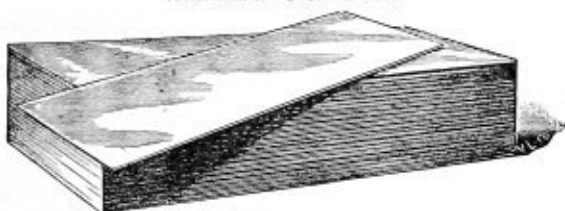


FIG. 5000

IN SHEETS 30 X 60 INCHES

Weight per square ft.....oz.	8	10	12	14	16	20
Weight per sheet.....lbs.	5.20	7.17	9.38	11.	12.50	15.62
Nearest Stubb's gage.....	31	27	26	25	24	22
Weight per square foot, oz.	24	32	40	48	56	64
Weight per sheet.....lbs.	18.75	25.	31.25	37.50	43.75	50.
Nearest Stubb's gage.....	21	19	18	16	15	14

SCOTT'S EXTRA COATED HAMMERED OPEN HEARTH ROOFING TIN



FIG. 5001

This roofing tin is made from open hearth forged ingots. The hammering process produces great strength in the metal, more pliable and more adaptable to the terne coating, than plates made by rolling process.

	Thickness	Size, Inches	Weight per Box, Lbs.	Price per Box
Scotts	1C	14x20	255	\$.....
Scotts	1C	20x28	310	.....
Scotts	1X	14x20	255	.....
Scotts	1X	20x28	310	.....

SHEET ZINC

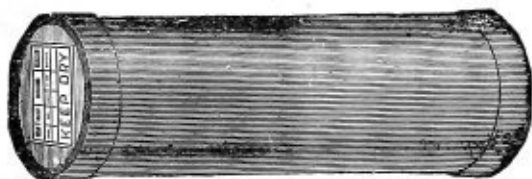


FIG. 5002

No. 9.	Width 36 inches, length 84 inches.....	per pound, \$.....
No. 9.	Width 48 inches, length 84 inches.....	per pound,

CORRUGATED SHEETS

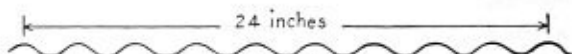
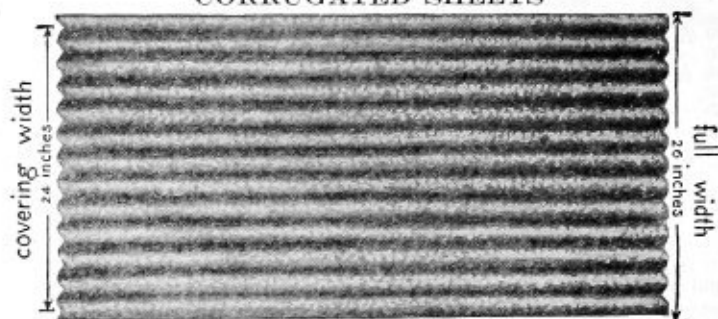


FIG. 5003

TWO V-CRIMPED ROOFING

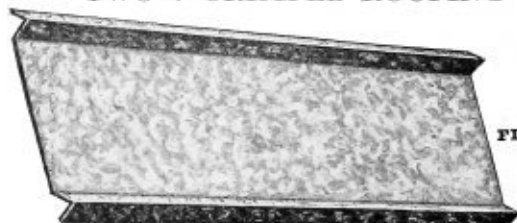


FIG. 5004

THREE V-CRIMPED ROOFING

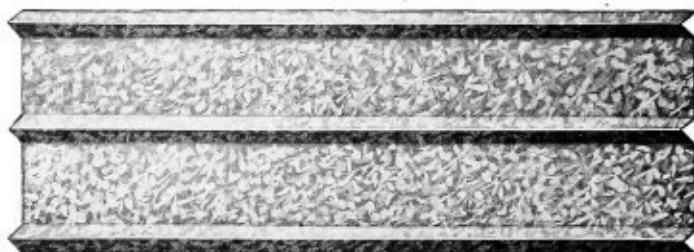


FIG. 5005

PRESSED STANDING SEAM ROOFING

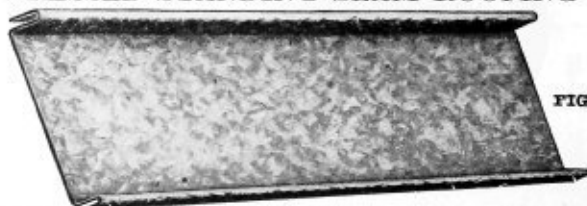


FIG. 5006

For sizes, weights and extras, etc., on above, see following pages

WEIGHTS AND EXTRAS PER SQUARE

PAINTED AND GALVANIZED, FORMED PRODUCTS

These extras to be added to the price quoted per square for 2½ inch Corrugated which is recognized as the base.

Open Hearth Steel	No. 29		No. 28		No. 27		No. 26		No. 24		No. 22		No. 20	
	Per Sq.		Per Sq.		Per Sq.		Per Sq.		Per Sq.		Per Sq.		Per Sq.	
Base Price for 2", 2½" and 3" Corrugated Steel Sheets	Base		Gal.	Ptd.	Gal.	Ptd.	Gal.	Ptd.	Gal.	Ptd.	Gal.	Ptd.	Gal.	Ptd.
	Wt.	77	68	85	76	91	83	98	110	124	136	151	163	178

FOR OTHER PATTERNS, ADD EXTRAS PER SQUARE AS FOLLOWS:

Open Hearth Steel	No. 29		No. 28		No. 27		No. 26		No. 24		No. 22		No. 20	
	Per Sq.		Per Sq.		Per Sq.		Per Sq.		Per Sq.		Per Sq.		Per Sq.	
		Gal.	Ptd.	Gal.	Ptd.	Gal.	Ptd.	Gal.	Ptd.	Gal.	Ptd.	Gal.	Ptd.	Gal.
1¼"-5½" Corrugated	Wt.	79	72	87	79	94	86	101	114	129	142	157	170	185
	Add	.10	.10	.10	.10	.10	.10	.15	.25	.15	.30	.15	.30	
2 V Crimped without sticks	Wt.	77	70	85	76	91	83	98	110	125	137	152	164	179
	Add	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3 V Crimped without sticks	Wt.	80	72	88	79	95	86	102	114	130	142	158	170	186
	Add	.15	.10	.15	.10	.15	.15	.20	.20	.20	.20	.20	.20	.25
Press Standing Seam with Cleats	Wt.	79	73	87	79	94	86	101	113	128	141	156	169	184
	Add	.15	.15	.15	.15	.15	.15	.20	.20	.25	.25	.35	.25	.45
Roll Roofing without cleats	Wt.	80	72	88	79	95	86	102	114	130	142	158		
	Add	.15	.15	.15	.15	.15	.20	.20	.20	.25	.20	.35		
Roll and Cap Roofing with Caps and Cleats	Wt.	85	77	93	84	100	91	106	119	134				
	Add	.50	.30	.50	.30	.50	.40	.60	.40	.60				
Beaded Ceiling	Wt.	79	70	85	76	91	83	98	110	125				
	Add	.20	.20	.20	.20	.20	.25	.25	.35	.40				
Weatherboard Siding	Wt.	82	72	88	79	95	86	102	113	130	142	158		
	Add	.25	.25	.25	.25	.25	.30	.30	.45	.45	.45	.50		
Plain Brick Siding	Wt.	72	64	78	71	85	77	91						
	Add	.10	.10	.10	.10	.10	.10	.10						
Rock Faced Brick and Stone Siding	Wt.	73	65	79	72	86	78	92						
	Add	.20	.20	.20	.20	.20	.20	.20						

(Continued on next page)

WEIGHTS AND EXTRAS PER SQUARE—CONTINUED
FOR OTHER PATTERNS, ADD EXTRAS PER SQUARE AS FOLLOWS;

Open Hearth Steel	No. 29		No. 28		No. 27		No. 26		No. 24		No. 22		No. 20	
		Gal.	Ptd.	Gal.	Ptd.	Gal.	Ptd.	Gal.	Ptd.	Gal.	Ptd.	Gal.	Ptd.	Gal.
4 V Crimp	Wt.	83	73	91	80	98	87	105						
	Add	.30	.30	.30	.30	.30	.35	.35						
5 V Crimp	Wt.	84	74	93	81	100	89	107						
	Add	.35	.35	.35	.35	.35	.40	.40						
2½-in. Corrugated Standing Seam Without Cleats	Wt.	83	73	91	80	98	87	105						
	Add	.35	.35	.35	.35	.35	.40	.40						
1½-in. Corrugated Standing Seam Without Cleats	Wt.	83	73	91	80	98	87	105						
	Add	.45	.45	.45	.45	.45	.50	.50						
Beaded Standing Seam Without Cleats	Wt.	78	72	86	78	92	86	101						
	Add	.20	.20	.20	.20	.20	.25	.25						
V Crimp	Wt.	83	73	91	80	98	87	105						
	Add	.35	.35	.35	.35	.35	.40	.40						
2½-in. Corrugated		.45	.45	.45	.45	.45	.50	.50						
1½-in. Corrugated		.45	.45	.45	.45	.45	.50	.50						

CLEATS—Painted or Galvanized.....extra per square \$0.05

FORMING—Sheets under 60" long.....extra per 100 lbs. .05

LOCKED ENDS—On V Crimped and Pressed Standing Seam

Roofingextra per square .10

LENGTH—Standard lengths of all forms are 60, 72, 84, 96, 108, 120, 132, 144 inches. Flat sheet extras for Black and Galvanized will apply on lengths under 60" down to 36" in addition to the forming charge of 5c mentioned in the caption "Forming."

All forms of Roofing in 12 ft. lengths.....extra per square .10

QUANTITY—Sizes other than standard (except lengths 36, 42, 48 and 54) of regular widths are subject to an extra of 10c per 100 lbs. if less than 4,000 lbs. per item.

STICKS—Used in bundling Crimped Sheets will be supplied at a charge of 20c per 100 lineal feet of strip.

For 2 V Crimped.....extra per square .10

Side Sticks for 3 V Crimped.....extra per square .10

Side and Center Sticks for 3 V Crimped.....extra per square .20

WEIGHTS—V Crimped with Sticks add.....4 lbs. per square
 3 V Crimped with Sticks add.....8 lbs. per square
 Roll Roofing with cleats add.....1 lb. per square
 Pressed Standing Seam without cleats deduct.....1 lb. per square
 Roll and Cap Roofing without Painted Cap deduct.....5 lbs. per square
 Roll and Cap Roofing without Galvanized Caps deduct.....6 lbs. per square
 Roll and Cap Roofing without cleats deduct.....1 lb. per square
 Painted Flat Sheets add to weight of Black.....2 lbs. per square

PLAIN RIDGE ROLL

Unless otherwise specified, we ship 2 inch size Galvanized Steel without nailing flange.



FIG. 5007

Made in 8 and 10 foot lengths.

Style A
Without Nailing Flange

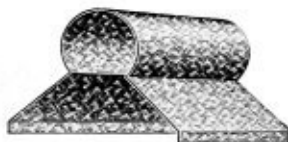


FIG. 5008

Style B
With Nailing Flange

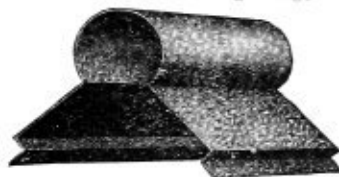


FIG. 5009

List Prices Per Foot

Size of rolls.....	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"
Size of aprons.....	1 1/2"	1 3/4"	2"	2 1/2"	3"	3 1/2"
Girths	6"	7"	8"	10"	12"	14"
29 gage, galvanized.....	\$0.13	\$0.14	\$0.16	\$0.19	\$0.23	\$0.28
28 gage, galvanized.....	.15	.16	.18	.21	.25	.30
26 gage, galvanized.....	.19	.20	.22	.25	.29	.34
24 gage, galvanized.....	.25	.26	.28	.31	.35	.40

If size is not specified we ship 2 inch. If quality is not mentioned we ship galvanized steel.

V ANGLE RIDGE CAP



FIG. 5010

Style A without nailing flange, also furnished in Style B with nailing flange.

List Prices Per Foot

Size of apron	3"	3 1/2"	4"	5"
Girths	6"	7"	8"	10"
29 gage, galvanized.....	\$0.13	\$0.14	\$0.16	\$0.19
28 gage, galvanized.....	.15	.16	.18	.21
26 gage, galvanized.....	.19	.20	.22	.25
24 gage, galvanized.....	.25	.26	.28	.31

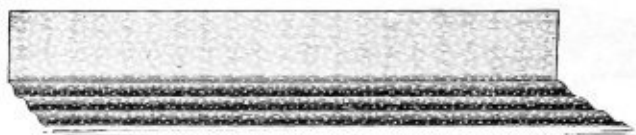
Weights of Plain Ridge Roll of different gages same as weight of lap joint eaves trough of same gage and girth.

Round Ridge Roll and V angle Ridge Cap are shipped in bundles, wired.

Prices on 22 gage and heavier upon application with specifications.

CORRUGATED SIDE WALL FLASHING

2½ inch or 1¼ inch Corrugations
No. 977

**FIG. 5011**

14" girth; 8" apron; 5½" return; 96" lengths.

No. 28 gage, galvanized; weight, 91 pounds.....\$20.00 per 100 lin. ft.
No. 28 gage, painted; weight, 73 pounds..... 13.50 per 100 lin. ft.

CORRUGATED END WALL FLASHING

2½ inch or 1¼ inch Corrugations
No. 978

**FIG. 5012**

6" girth; 4" apron; 2" return; lengths 28" and 96".

No. 28 gage, galvanized; weight, 39 pounds.....\$11.00 per 100 lin. ft.
No. 28 gage, painted; weight, 31 pounds..... 8.00 per 100 lin. ft.

Prices on 26 gage and heavier on application with specifications.

CORRUGATED RIDGE ROLL

2½ inch or 1¼ inch Corrugations
No. 979

**FIG. 5013**

2" roll; 4" apron; 12" girth; 27" and 96" lengths.

No. 28 gage, galvanized; weight, 78 pounds.....\$16.00 per 100 lin. ft.
No. 28 gage, painted; weight, 62 pounds..... 10.00 per 100 lin. ft.

2" roll; 8" apron; 20" girth; 27" length.

No. 28 gage, galvanized; weight, 130 pounds.....\$25.00 per 100 lin. ft.
No. 28 gage, painted; weight, 104 pounds..... 15.00 per 100 lin. ft.

CORRUGATED WOOD RIDGE JOINTS

No. 981

**FIG. 5014**

3", 2½", 2" or 1¼" Corrugations.

Used under apron of plain ridge roll and capping when roof is covered with corrugated sheets.

LEAD WASHERS

Make a tight joint and prevent rust forming under nail heads. There are about 325 to the pound, and usually one-third pound is sufficient to apply one square of the material.

Full Size



FIG. 5015

CORRUGATED SIDING



FIG. 5016

How to Nail Corrugated Siding

CURVED CORRUGATED SHEETS

2½ inch Corrugation

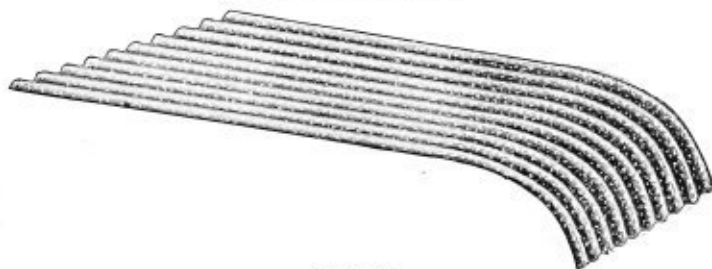


FIG. 5017

Shows corrugated sheet curved for awnings.



FIG. 5018

Shows corrugated sheet for roofing and ceiling. We curve 2½ inch corrugated sheets to any required radius, in any gage, from 12 to 26, inclusive, and guarantee all curving to correspond with specifications furnished.

CORRUGATED SHEETS

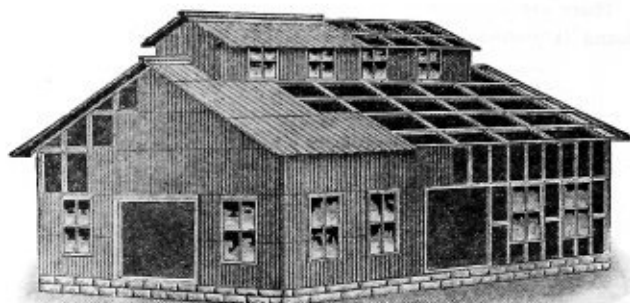


FIG. 5019

Shows application of corrugated sheets on roof and sides of skeleton frame building.

Pitch of Roof.—We do not advise the use of corrugated sheets on any roof of less pitch than three inches to the foot, and more is better.

Truss roofs should have pitch of one-fifth to one-fourth.

Distance Between Supports on Roof.—For Corrugated roofing, No. 26 gage and lighter should be laid on close boarding, or strong lath not more than 1 foot apart.

No. 24 can be used on purlins 2 to 3 feet from centers.

Nos. 22 to 20 can be used on purlins 3 to 4 feet from centers.

No. 18 can be used on purlins 4 to 5 feet from centers.

No. 16 can be used on purlins 5 to 6 feet from centers.

Style of Metal Roofing to Use

When the pitch of roof is three inches to the foot or more, corrugated and V crimped roofing or metal shingles may be used. If V crimped is desired remember that the extra V in 3 V crimped roofing strengthens the sheet greatly and prevents rattling.

Where the roof pitch is less than three inches to the foot, roll and cap, or pressed standing seam roofing must be applied, as slow running water or collected snow cannot seep through the joints in these styles.

CORRUGATED SHEETS

APPLYING CORRUGATED ROOFING ON WOOD SHEATHING AND RAFTERS

Begin laying the roofing from the end opposite to which the wind blows, i. e., if the wind blows from the left end of the building, start laying the roofing at right end. This is done so the wind will not have the opportunity to drive under the laps. Allow one corrugation of the first sheet to extend over the roof boards at edge, and allow from a two to three-inch projection of the end of the sheet over the eaves. Be careful to preserve straight lines. Hammer the projecting corrugation down over the edge of roof boards and nail it. Through the tops of every other corrugation drive nails at the eaves. Do not nail except at sides and ends of sheets. The second sheet should be lapped over the first about one and a half corrugations, and nails driven at intervals of eight inches through this lap. In laying the second row of sheets lap the lower end of sheet over the first row about three to six inches. It is a good plan to paint as the roofing is laid between laps over sheets, thus making them watertight. For light gage corrugated roofing such as No. 26 and No. 28 there should be close sheathing. For the heavier gages, sheathing board may be dispensed with and purlins substituted. Where the pitch on roof is less than three inches per foot, Roll and Cap Roofing, or Pressed Standing Seam Roofing should be used. It requires one-half pound of nails to attach a square of Corrugated Roofing. It requires about one-quarter pound of lead washers for the same area, and these should be used under the nails in every instance.

APPLYING CORRUGATED ROOFING ON IRON FRAMING



FIG. 5020



FIG. 5022



FIG. 5021



FIG. 5023

Fig. 5020—Strap iron cleat riveted at each end.

Fig. 5021—Long wire or clinch nail driven through the corrugated sheets and bent around angle iron.

Fig. 5022—Cleat made from bar iron, riveted to roofing and binding against the flange of Z bar or angle iron.

Fig. 5023—A strap iron cleat riveted at one end only; the other end clamping flange to channel iron.

Illustrations show some of the best methods to follow in fastening corrugated sheets to iron beams and purlins. Side laps must be riveted each 12 to 18 inches or closer; end laps every alternate corrugation. It requires about six anchors to properly fasten a sheet when it is attached to iron.

CORRUGATED SHEETS

FOR ROOFING, SIDING, CEILING, DOORS, SHUTTERS,
AWNINGS, ETC.

GALVANIZED OR PAINTED

The rigidity imparted to comparatively light sheets by corrugating makes them self-supporting, thereby permitting their use on light, inexpensive framing, the result being a substantial building with a handsome appearance.

The following table shows the number of square feet in the different lengths of 2, 2½ and 3 inch Corrugated Sheets (width 26 inches). For 1½ inch Corrugated (width 25 inches) multiply result in table by the decimal .962. For 5/8 inch Corrugated (width 25½ inches) multiply result in table by decimal .98. For V-Crimp and Pressed Standing Seam Roofing (width 24 inches) multiply by .923.

No. Sheets	Length of Corrugated Sheets						No. Sheets	Length of Corrugated Sheets					
	6 ft.	7 ft.	8 ft.	9 ft.	10 ft.	12 ft.		6 ft.	7 ft.	8 ft.	9 ft.	10 ft.	12 ft.
2	26	31	35	39	44	52	51	663	774	884	995	1105	1326
3	39	46	52	59	65	78	52	676	789	902	1014	1127	1352
4	52	61	70	78	87	104	53	689	804	919	1034	1149	1378
5	65	76	87	98	109	130	54	702	819	936	1053	1170	1404
6	78	91	104	117	130	156	55	715	835	954	1073	1192	1430
7	91	107	122	137	152	182	56	728	850	971	1092	1214	1456
8	104	122	139	156	174	208	57	741	865	988	1112	1235	1482
9	117	137	156	176	195	234	58	754	880	1006	1131	1257	1508
10	130	152	174	195	217	260	59	767	895	1023	1151	1279	1534
11	143	167	191	215	239	286	60	780	910	1040	1170	1300	1560
12	156	182	208	234	260	312	61	793	926	1058	1190	1322	1586
13	169	198	226	254	282	338	62	806	941	1075	1209	1344	1612
14	182	213	242	273	304	364	63	819	956	1092	1229	1365	1638
15	195	228	260	293	325	390	64	832	971	1110	1248	1387	1664
16	208	243	278	312	347	416	65	845	986	1127	1268	1409	1690
17	221	258	295	332	369	442	66	858	1001	1144	1287	1430	1716
18	234	273	312	351	390	468	67	871	1017	1162	1307	1452	1742
19	247	289	330	371	412	494	68	884	1032	1179	1326	1474	1768
20	260	304	347	390	434	520	69	897	1047	1196	1346	1495	1794
21	273	319	364	410	455	546	70	910	1062	1214	1365	1517	1820
22	286	334	382	429	477	572	71	923	1077	1231	1385	1539	1846
23	299	349	399	449	499	598	72	936	1092	1248	1404	1560	1872
24	312	364	416	468	520	624	73	949	1108	1266	1424	1582	1898
25	325	379	434	488	542	650	74	962	1123	1283	1443	1604	1924
26	338	395	451	507	564	676	75	975	1138	1300	1463	1625	1950
27	351	410	468	527	585	702	76	988	1153	1318	1482	1647	1976
28	364	425	486	546	607	728	77	1001	1168	1335	1502	1669	2002
29	377	440	503	566	629	754	78	1014	1182	1352	1521	1690	2028
30	390	455	520	585	650	780	79	1027	1199	1370	1541	1712	2054
31	403	470	538	605	672	806	80	1040	1214	1387	1560	1734	2080
32	416	486	555	624	694	832	81	1053	1229	1404	1580	1755	2106
33	429	501	572	644	715	858	82	1066	1244	1422	1599	1777	2132
34	442	516	590	663	737	884	83	1079	1259	1439	1619	1799	2158
35	455	531	607	683	759	910	84	1092	1274	1456	1638	1820	2184
36	468	546	624	702	780	936	85	1105	1290	1474	1658	1842	2210
37	481	562	642	722	802	962	86	1118	1305	1491	1677	1864	2236
38	494	577	659	741	824	988	87	1131	1320	1508	1697	1885	2262
39	507	592	676	761	845	1014	88	1144	1335	1526	1716	1907	2288
40	520	607	694	780	867	1040	89	1157	1350	1543	1736	1929	2314
41	533	622	711	800	889	1066	90	1170	1365	1560	1755	1950	2340
42	546	637	728	819	910	1092	91	1183	1381	1578	1775	1972	2366
43	559	653	746	839	932	1118	92	1196	1396	1595	1794	1994	2392
44	572	668	763	858	954	1144	93	1209	1411	1612	1814	2015	2418
45	585	683	780	878	975	1170	94	1222	1426	1630	1833	2037	2444
46	598	698	798	897	997	1196	95	1235	1441	1647	1853	2059	2470
47	611	713	815	917	1019	1222	96	1248	1456	1664	1872	2080	2496
48	624	728	832	936	1040	1248	97	1261	1472	1682	1892	2102	2522
49	637	744	850	956	1062	1274	98	1274	1487	1699	1911	2124	2548
50	650	759	867	975	1084	1300	99	1287	1502	1716	1931	2145	2574
							100	1300	1517	1734	1950	2167	2600

HELPS FOR FIGURING CORRUGATED SHEETS

Number of Corrugated Sheets in One Square				Number of Square Ft. in One Corrugated Sheet			
Length of Sheet Feet	1½, 2, 2½ and 3 inch Corrugations (wd. 26") (wd. 27½")	1½ inch Corrugations (width 25 ins.)		Length of Sheet Feet	1½, 2, 2½ and 3 inch Corrugations (wd. 26") (wd. 27½")	1½ inch Corrugations (width 25 ins.)	
5	9.23	8.73	9.60	5	10.83	11.46	10.42
6	7.69	7.30	8.00	6	13.00	13.75	12.50
7	6.59	6.24	6.86	7	15.17	16.05	14.58
8	5.77	5.46	6.00	8	17.33	18.33	16.67
9	5.13	4.85	5.33	9	19.50	20.63	18.75
10	4.62	4.37	4.80	10	21.67	22.92	20.83
11	4.19	3.97	4.37	11	23.85	25.21	22.88
12	3.85	3.68	4.00	12	26.00	27.50	25.00

Full width of Corrugated Sheets is charged for. No allowance is made for laps in these tables.

HOW TO ESTIMATE AMOUNT OF CORRUGATED SHEETS

First select the best lengths of sheets to fit the space, bearing in mind the end laps. On siding one inch lap will do, while for Roofing nothing less than three inches, and if a slight pitch, six inches, for end lap. As each sheet of No. 28 Gage laps just two feet wide it is a simple matter to ascertain the number of sheets necessary to cover the space. Then estimate the number of feet in our two (2) and two and one-half (2½) inch corrugated sheets as follows:

5 ft. long, 10 5-6	sq. ft. lay 2 ft. wide, selling measure 26 in. wide
6 ft. long, 13	sq. ft. lay 2 ft. wide, selling measure 26 in. wide
7 ft. long, 15 1-6	sq. ft. lay 2 ft. wide, selling measure 26 in. wide
8 ft. long, 17 1-3	sq. ft. lay 2 ft. wide, selling measure 26 in. wide
9 ft. long, 19 1-2	sq. ft. lay 2 ft. wide, selling measure 26 in. wide
10 ft. long, 21 2-3	sq. ft. lay 2 ft. wide, selling measure 26 in. wide
11 ft. long, 23 5-6	sq. ft. lay 2 ft. wide, selling measure 26 in. wide
12 ft. long, 26	sq. ft. lay 2 ft. wide, selling measure 26 in. wide

On 1½ inch or small Corrugated Sheets, figure as follows:

5 ft. long, 10 5-12	sq. ft. lay 2 ft. wide, selling measure 25 in. wide
6 ft. long, 12 1-2	sq. ft. lay 2 ft. wide, selling measure 25 in. wide
7 ft. long, 14 7-12	sq. ft. lay 2 ft. wide, selling measure 25 in. wide
8 ft. long, 16 2-3	sq. ft. lay 2 ft. wide, selling measure 25 in. wide
9 ft. long, 18 3-4	sq. ft. lay 2 ft. wide, selling measure 25 in. wide
10 ft. long, 20 5-6	sq. ft. lay 2 ft. wide, selling measure 25 in. wide
11 ft. long, 22 11-12	sq. ft. lay 2 ft. wide, selling measure 25 in. wide
12 ft. long, 25	sq. ft. lay 2 ft. wide, selling measure 25 in. wide

When necessary, we cut sheets in the middle and give half sheets of any of the above lengths. When we cut to odd inches, say 7 feet 9 inches, we charge for an 8 foot sheet, unless we have two or three weeks in which to fill order, so as to have sheets made odd sizes.

Always specify length of sheets and size of corrugation.

As no allowance is made for laps the following table gives the number of square feet necessary to cover one square (100 sq. ft.) of surface, providing there is no waste in cutting.

ESTIMATE FOR 2½ OR 1½-INCH CORRUGATION, 26 INCHES WIDE

END LAP	1 inch	2 inches	3 inches	4 inches	5 inches	6 inches
Side Lap 1 Corrugation	110 sq. ft.	111 sq. ft.	112 sq. ft.	113 sq. ft.	114 sq. ft.	115 sq. ft.
Side Lap 1½ Corrugation	116 sq. ft.	117 sq. ft.	118 sq. ft.	119 sq. ft.	120 sq. ft.	121 sq. ft.
Side Lap 2 Corrugation	123 sq. ft.	124 sq. ft.	125 sq. ft.	126 sq. ft.	127 sq. ft.	128 sq. ft.

ESTIMATE FOR 1½-INCH CORRUGATION, 25 INCHES WIDE

END LAP	1 inch	2 inches	3 inches	4 inches	5 inches	6 inches
Side Lap 1 Corrugation	107½ sq. ft.	108½ sq. ft.	109½ sq. ft.	110½ sq. ft.	111½ sq. ft.	112½ sq. ft.
Side Lap 1½ Corrugation	110½ sq. ft.	111½ sq. ft.	112½ sq. ft.	113½ sq. ft.	114½ sq. ft.	115½ sq. ft.
Side Lap 2 Corrugation	113½ sq. ft.	114½ sq. ft.	115½ sq. ft.	116½ sq. ft.	117½ sq. ft.	118½ sq. ft.

These tables are based on using 96 inch sheets; if longer or shorter lengths are used there will be a slight variation from the above estimate.

RULES OF MEASUREMENT

All metal Roofing, Siding, Ceiling, etc., except Galvanized material, is painted both sides, unless otherwise ordered.

All metal Roofing, Siding and Ceiling, are sold by the square (100 square feet), except Corrugated, which is sold by the square or pound, as preferred.

A square consists of 100 square feet and is calculated by the following rules of measurement:

CORRUGATED IMITATION STONE AND IMITATION BRICK.—The full width and length of sheets, after being corrugated or formed, are calculated.

V CRIMPED, BEADED AND WEATHER BOARD SIDING.—The full length of sheets, together with the actual covering width, is calculated.

STANDING SEAM ROOFING.—The actual covering width and full length are calculated, whether the sheets are connected by end locks and shipped in rolls, or separate and shipped in crates.

WIDE GUTTERS AND VALLEYS.—The full width or girt and length of material are calculated.

NAILS, WOOD STRIPS, DRY PAINT AND READY MIXED PAINTS are sold by the pound, gallon or square (the amount generally required in applying a square). They are not included in the price quoted on the Sheet Metal goods but are charged as separate items when furnished.

ROOFS.—Measure the length of the roof, including the amount turned up or down at each end or gable, and multiply by the distance from eave to eave, including the material used in the ridge seam, and the material lapped either down or up at eaves.

ROOFS WITH HIPS, VALLEYS, DORMERS, ETC.—Measure each section through the center horizontally and multiply by the length of the strip of metal at the center, and in addition to the actual surface of the roof measure the length of hips and valleys by one foot wide. The extra measure of hips and valleys is to compensate for the extra labor and loss of material in cutting, fitting and laying same.

OPENINGS.—Make no deductions for openings, chimneys, stacks, sky-light, window or ventilator, unless such openings measure more than 50 sq. ft.; if more than 50 sq. ft. and not more than 100 sq. ft. deduct half the size of the opening; if more than 100 sq. ft. deduct the full size of opening.

The labor to flash pipes and round stacks, whether of brick or metal, is charged extra.

The reason for not deducting otherwise than as specified is that the waste of material and extra work in cutting and fitting the material for flashing such openings is equal to or greater than the value of the materials cut out.

GUTTERS AND VALLEYS.—Multiply full length by full width or girt.

SIDING.—Multiply full length of each section by the height. **DEDUCTIONS.**—Make no deductions for any window, door or other opening, unless said opening measures more than 10 sq. ft.; if more than 10 sq. ft., and not more than 25 sq. ft., deduct one-half of such openings. If more than 25 sq. ft., deduct all such openings, except when the wood casings to the windows, doors and other openings are to be covered with iron or steel casings; in such instances no deductions for openings are to be made, whether the openings be more or less than 10 sq. ft.

GABLES.—To estimate contents of gables multiply the width by one-half the height, or multiply the height by one-half the width.

CORNER STRIPS are charged extra by the lineal foot; the cornice is charged extra in all instances as the price varies according to the girt of material used and style of the same.

EAVES TROUGH AND CONDUCTOR PIPES.—Measure the entire length and add one foot extra for each Miter, Shoe or other angle.

EAVES TROUGH **GALVANIZED OR OPEN HEARTH STEEL**

Made in 10 Foot Lengths

List prices per foot. Minimum weight per 100 lineal feet.

Packed in crates of 250 feet.

Single Bead Lap Joint Eaves Trough



FIG. 5024

Gage	Ounces Sizes of Trough, Per Sq. inches											
	Foot	Sizes of Beads, inches	3	3½	4	4½	5	6	7	8	9	10
		Girth, in inches	6	7	8	9	10	12	14	16	18	20
29	11½	List	\$0.13	.14	.16	.18	.19	.23	.27	.31	.36	.40
		Weight, lbs.	35	40	46	52	58	70				
28	12½	List	.15	.16	.18	.20	.21	.25	.30	.34	.38	.42
		Weight, lbs.	38	44	50	57	63	76				
26	14½	List	.19	.20	.22	.24	.25	.30	.35	.40	.45	.50
		Weight, lbs.	44	51	58	66	73	88				
24	18½	List			.28	.30	.31	.37	.44	.50	.56	.62
		Weight, lbs.			75	84	93	112				

Double Bead Lap Joint Eaves Trough



FIG. 5025

Gage	Sizes of Trough, inches											
	Sizes of Beads, inches		3	3½	4	4½	5	6	7	8	9	10
		Girth, in inches	8	9	10	11	12	14	16	18	20	22
29	List	\$0.18	.19	.21	.23	.24	.28	.32	.36	.41	.45	
28	List	.20	.21	.23	.25	.26	.30	.35	.39	.43	.47	
26	List	.24	.25	.27	.29	.30	.35	.40	.45	.50	.55	
24	List			.33	.35	.36	.42	.49	.55	.61	.67	

Always state whether Slip or Lap Joint is wanted. Slip Joint Single Bead will be shipped unless otherwise ordered.

Prices on heavier gages and special sizes, also Copper Trough quoted on application with specifications.

EAVES TROUGH

GALVANIZED OR OPEN HEARTH STEEL

Made in 10 Foot Lengths

List prices per foot. Minimum weight per 100 lineal feet.

Packed in crates of 250 feet.

Single Bead Slip Joint Eaves Trough



FIG. 5026

Ounces		Per Sq. Sizes of Trough,											
Gage	Foot	inches	3	3½	4	4½	5	6	7	8	9	10	
29	11½	List	\$.14	.15	.17	.19	.20	.25	.29	.33	.38	.42	
		Weight, lbs.	35	41	47	53	59	71					
28	12½	List	.16	.17	.19	.21	.22	.27	.32	.36	.40	.44	
		Weight, lbs.	39	45	52	58	65	78					
26	14½	List	.20	.21	.23	.25	.26	.32	.37	.42	.47	.52	
		Weight, lbs.	45	52	60	67	75	90					
24	18½	List	...	...	.29	.31	.32	.39	.46	.52	.58	.64	
		Weight, lbs.	...	...	77	86	96	115					

Double Bead Slip Joint Eaves Trough



FIG. 5027

Gage	Sizes of Trough, inches		3	3½	4	4½	5	6	7	8	9	10
29	List		\$.19	.20	.22	.24	.25	.30	.34	.38	.43	.47
28	List		.21	.22	.24	.26	.27	.32	.37	.41	.45	.49
26	List		.25	.26	.28	.30	.31	.37	.42	.47	.52	.57
24	List		...	...	.34	.36	.37	.44	.51	.57	.63	.69

The List Prices and Minimum Weights are given so that the buyer may know the comparative cost and weight of the different gages of Eaves Trough.

EAVES TROUGH MITERS

Galvanized

Single Bead Outside Miter



FIG. 5028

Single Bead Inside Miter



FIG. 5029

When ordering, specify whether Single or Double Bead, whether inside or outside (and whether right or left-hand, when ordering Slip-Joint) otherwise half of each, Single Bead, will be shipped. State whether Slip or Lap Joint is desired.

Smooth, strong and durable. Packed 5 dozen in a crate.

The 7 and 8 inch sizes are made in two pieces. List prices per dozen.

SINGLE BEAD-LAP JOINT

Size, inches.....	3½	4	4½	5	6	7	8
No. 29 Gage.....	\$3.25	\$3.50	\$4.00	\$4.00	\$5.00	\$6.50	\$8.00
No. 28 Gage.....	3.50	3.75	4.25	4.25	5.40	7.00	8.50

DOUBLE BEAD-LAP JOINT

No. 29 Gage.....	\$4.25	\$4.50	\$5.00	\$5.00	\$6.00	\$7.50	\$9.00
No. 28 Gage.....	4.50	4.75	5.25	5.25	6.40	8.00	9.50

SINGLE BEAD-SLIP JOINT

No. 29 Gage.....	\$4.25	\$4.50	\$5.00	\$5.00	\$6.00	\$7.50	\$9.00
No. 28 Gage.....	4.50	4.75	5.25	5.25	6.40	8.00	9.50

DOUBLE BEAD-SLIP JOINT

No. 29 Gage.....	\$5.25	\$5.50	\$6.00	\$6.00	\$7.00	\$8.50	\$10.00
No. 28 Gage.....	5.50	5.75	6.25	6.25	7.40	9.00	10.50

Two-Piece Miters are special and on application we will quote a discount applicable to above list. For other gages Two-Piece Miters only are furnished, on which net prices will be quoted.

ENDS AND DROPS

GALVANIZED OR OPEN HEARTH STEEL

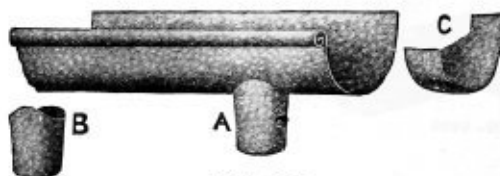


FIG. 5030

Made of a 12 inch piece of trough with an outlet to which the drop connection "B" is attached. The end is closed with the slip joint and cap "C," which requires no solder.

BOTH ENDS AND OUTLETS ARE DOUBLE SEAMED—NOT SOLDERED

Packed as follows:

A Ends—3 and 4 inch, with 2 inch drop, 10 doz. per crate.

4 inch with 3 inch drop and larger sizes, 5 doz. per crate.

C Ends—3 to 5 inch, 20 doz. per box. Larger sizes, 10 doz. per box

List Prices Per Dozen

Size, inches.....	2	2½	3	3½	4	4½	5	6	7	8
NO. 29 GAGE										
"A" Ends, Single										
Bead			\$2.50	\$2.50	\$2.70	\$3.00	\$3.00	\$3.60	\$4.00	\$4.20
"A" Ends, Double										
Bead			3.10	3.10	3.30	3.60	3.60	4.30	4.75	5.00
"B" Drops only	\$0.80	\$0.90	1.00	1.10	1.20	1.30	1.30	1.60	....	....
"C" Ends only.....			1.30	1.30	1.50	1.60	1.60	1.90	2.30	2.80
NO. 28 GAGE										
"A" Ends, Single										
Bead			2.75	2.75	3.00	3.30	3.30	3.95	4.40	4.65
"A" Ends, Double										
Bead			3.40	3.40	3.65	3.95	3.95	4.75	5.25	5.50
"B" Drops only....	.90	1.00	1.10	1.20	1.35	1.45	1.45	1.75	....	....
"C" Ends only.....			1.45	1.45	1.65	1.75	1.75	2.10	2.55	3.10

Odd girths not specified take list of next higher girth.

EAVES TROUGH HANGERS TRIPLE TWISTED CROSS BAR

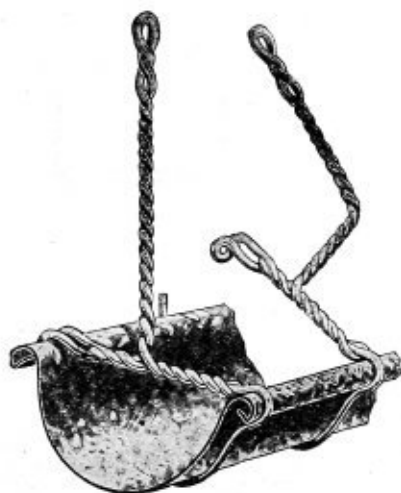


FIG. 5031

Application of Single Bead Hanger

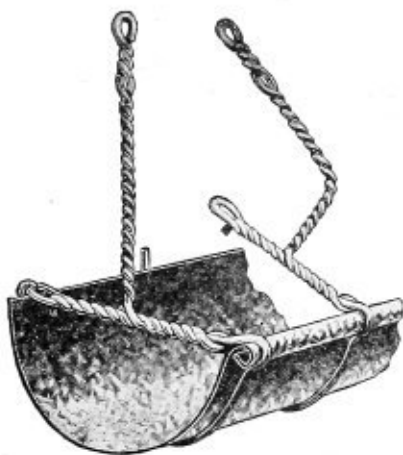


FIG. 5032

Application of Double Bead Hanger

List Price Per Gross. A Gross to the Box

Size	3	3½	4	4½	5	6	7	8
Single Bead	\$2.75	\$2.75	\$2.75	\$3.00	\$3.00	\$3.50	\$4.00	\$4.50
Double Bead	3.00	3.00	3.00	3.25	3.25	3.75	4.25	4.75
Shipping weight, lbs.	23	24	25	26	27	30	34	40

We provide for ½ inch bead on all sizes up to 6 inch. Larger sizes are made for ⅝ inch bead unless otherwise ordered.

The 7 and 8 inch Hangers are packed one-half gross to the box.



FIG. 5033

WIRE CONDUCTOR STRAINERS

Keep obstructions from clogging conductor pipe.

Size, inches	2	3	4	5	6
Per dozen	\$1.50	\$2.00	\$3.00	\$5.00	\$6.00

CONDUCTOR PIPE HOOKS

MALLEABLE IRON

Plain Hinged Hooks



FIG. 5034

Corrugated Hinged Hooks



FIG. 5035

Square Wired Hooks



FIG. 5036

Plain Sickle Hooks



FIG. 5037

Corrugated Sickle Hooks



FIG. 5038

List Prices Per 100, Tinned

Size inches		2	2½	3	3½	4	5	6	8
Style	For								
Plain	Wood	\$3.00	.....	\$4.00	.....	\$5.00	.....	.....	.....
Hinged Hooks	Brick	3.50	.....	4.50	.....	5.50	\$8.00	\$10.50	.....
Corrugated	Wood Long	3.50	.....	4.50	.....	6.00	7.50	10.00	.....
Hinged Hooks	Brick	3.50	.....	4.50	.....	6.50	8.00	10.50	.....
Plain	Wood	1.50	\$2.00	2.50	\$3.00	3.50	5.00	7.00	.....
Sickle Hooks	Brick	1.75	2.75	2.75	4.25	4.25	6.00	7.50	\$15.00
Corrugated	Wood	1.50	.....	2.50	.....	3.50	.....	.....	.....
Sickle Hooks	Brick	1.75	.....	2.75	.....	4.25	.....	.....	.....
*Square	Wood	2.00	.....	2.50	.....	3.25	4.25	.....	.....
Wired Hooks	Brick	2.50	.....	3.50	.....	4.00	4.50	6.00	.....

*Two inch hooks are for 2 inch plain pipe; 2½ inch are for 2 inch corrugated and plain pipe.

Always state whether hooks are for wood or brick.

CONDUCTOR PIPE

Made in 10-foot lengths. Packed in skeleton crates, 250 feet of one size to the crate. All sizes from 2 to 6 inches can be nested in one crate.

Plain Round Pipe



FIG. 5039

List Prices Per Foot. Minimum Weights Per 100 Lineal Feet.

		Ounces per sq.								
Gage	Foot	Sizes	1½ in.	2 in.	2½ in.	3 in.	3½ in.	4 in.	5 in.	6 in.
29	11½	List	\$0.11	\$0.13	\$0.14	\$0.15	\$0.18	\$0.20	\$0.25	\$0.30
		Weight, lbs.	32	40	49	58	67	76	94	111
28	12½	List	.13	.15	.16	.17	.20	.23	.28	.33
		Weight, lbs.	35	44	53	63	73	82	102	121
26	14½	List		.19	.20	.21	.24	.28	.34	.40
		Weight, lbs.		51	63	74	85	96	119	141
24	18½	List				.27	.31	.35	.44	.52
		Weight, lbs.				95	109	123	152	180

Round Corrugated Pipe



FIG. 5040

		Ounces per sq.						
Gage	Foot	Sizes	2 in.	3 in.	4 in.	5 in.	6 in.	
29	11½	List		\$0.13	\$0.15	\$0.20	\$0.25	\$0.30
		Weight, lbs.		47	58	76	94	111
28	12½	List		.15	.17	.23	.28	.33
		Weight, lbs.		51	63	82	102	121
26	14½	List		.19	.21	.28	.34	.40
		Weight, lbs.		59	74	96	119	141
24	18½	List			.27	.35	.44	.52
		Weight, lbs.			95	123	152	180

Square Corrugated Pipe

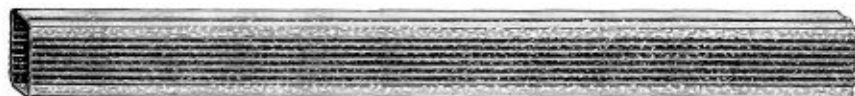


FIG. 5041

List Prices Per Foot. Minimum Weights Per 100 Lineal Feet.

		Ounces per sq.				
Gage	Foot	Sizes	1½x2¼ in.	2½x3¼ in.	2¾x4¼ in.	3¾x5 in.
29	11½	List		\$0.15	\$0.17	\$0.22
		Weight, lbs.		46	60	80
28	12½	List		.17	.19	.25
		Weight, lbs.		50	65	87
26	14½	List		.21	.23	.30
		Weight, lbs.		59	76	101
24	18½	List			.29	.37
		Weight, lbs.			98	130

Galvanized Round Corrugated will be shipped unless ordered otherwise.

CONDUCTOR PIPE ELBOWS AND SHOES

GALVANIZED OR OPEN HEARTH STEEL

Order by pattern number to indicate the angle wanted. All our pipe and elbows are perfectly uniform and true.

ROUND CORRUGATED ELBOWS AND SHOES

No. 1—45°



FIG. 5042

No. 2—60°



FIG. 5043

No. 3—75°



FIG. 5044

No. 4 or Shoe—90°



FIG. 5045

PLAIN ROUND ELBOWS AND SHOES

No. 1—45°



FIG. 5046

No. 2—60°



FIG. 5047

No. 3—75°



FIG. 5048

No. 4 or Shoe—90°



FIG. 5049

List Prices, Round Corrugated and Plain Round Elbows and Shoes

Size	Galv'd Steel		14-Oz. Copper		16-Oz. Copper	
	Elbows	Shoes	No. 0-1-2-3	No. 4 Elb's	No. 0-1-2-3	No. 4 Elb's
2 -in., each.....	\$0.30	\$0.40	\$0.70	\$0.75	\$0.75	\$0.85
2½ -in., each.....	.36	.48	.90	1.00	1.00	1.00
3 -in., each.....	.36	.48	.90	1.00	1.00	1.10
3½ -in., each.....	.60	.75	1.35	1.50	1.50	1.65
4 -in., each.....	.60	.75	1.35	1.50	1.50	1.65
5 -in., each.....	1.25	1.50	2.00	2.25	2.25	2.50
6 -in., each.....	1.50	1.80	2.85	3.15	3.15	3.50

Specify the number or angle desired, otherwise No. 3 will be furnished.
Round Corrugated Elbows cannot be furnished in 2½ in. and 3½ in. size.

SQUARE CORRUGATED ELBOWS

No. 1A—45°



FIG. 5050

No. 2A—60°



FIG. 5051

No. 3A—75°



FIG. 5052

No. 4A—90°



FIG. 5053

Style A elbows are bent the wide way of the pipe.

No. 1B—45°



FIG. 5054

No. 2B—60°



FIG. 5055

No. 3B—75°



FIG. 5056

No. 4B or Shoe—90°



FIG. 5057

Style B elbows are bent the narrow way of the pipe.

List Prices, Square Corrugated Elbows and Shoes

Size	Galv'd Elbows	Steel Shoes	14-Oz. Elbows No. 0-1-2-3	Copper Shoes and No. 4 Elb.	14-Oz. Elbows No. 0-1-2-3	Copper Shoes and No. 4 Elb.
2-in., each	\$0.40	\$0.50	\$0.85	\$0.90	\$0.90	\$1.05
3-in., each	.50	.60	1.10	1.20	1.20	1.35
4-in., each	.65	.80	1.60	1.80	1.80	2.00
5-in., each	1.00	1.25	2.40	2.75	2.75	3.00

Specify the number or angle desired, otherwise No. 3A will be furnished.

ADJUSTABLE ELBOWS



FIG. 5058



FIG. 5059



FIG. 5060



FIG. 5061



FIG. 5062

Price Per Dozen

Sizes	1½	2	2½	3	4	5	6	7	8	9	10
No. 28 Galvanized Steel	\$2.40	2.40	3.60	3.60	4.80	6.60	9.00	14.00	16.50	19.00	22.00
Tin	2.00	2.00	2.60	2.60	4.00	5.40	8.00	12.00	14.00	16.00	18.00

RAIN WATER CUT-OFFS

For Plain Round Pipe



FIG. 5063

For Round Corrugated Pipe



FIG. 5064

No solder used in their manufacture. Galvanized after formed.

GALVANIZED OR OPEN HEARTH STEEL

List Prices Per Dozen

ROUND CORRUGATED		PLAIN ROUND	
2-inch	\$ 7.50	2 -inch	\$ 7.00
3-inch	8.00	2½-inch	7.50
4-inch	11.00	3 -inch	8.00
5-inch	20.00	3½-inch	11.00
6-inch	24.00	4 -inch	11.00
		5 -inch	20.00
		6 -inch	24.00

Packed as follows: 2 and 4-inch, 1 doz. per crate; 5 and 6-inch, ½ doz. per crate. Not sold in less than crate lots.

"CENTENNIAL" RAIN WATER CUT-OFF
PLAIN OR CORRUGATED

Left Hand



FIG. 5065

Sectional View



FIG. 5066

Right Hand

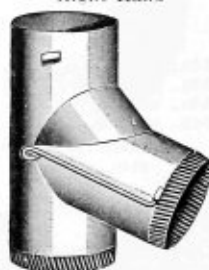


FIG. 5067

Put up one dozen in a crate, half right and half left, unless otherwise ordered. The cut-offs can be used in any position without extra pipe or elbows.

List Price Per Dozen Galvanized Steel

Size Plain Round		Size Round Corrugated.	
2-inch No. 30 Gage.....	\$ 8.75	2-inch No. 30 Gage.....	\$10.00
3-inch No. 30 Gage.....	10.00	3-inch No. 30 Gage.....	11.00
4-inch No. 28 Gage.....	13.75	4-inch No. 28 Gage.....	15.00
5-inch No. 28 Gage.....	20.00	5-inch No. 28 Gage.....	21.25

Galvanized Steel Round Corrugated Cut-offs will be shipped when not otherwise specified.



FIG. 5068

LANE JOIST HANGER

STYLE A

For Wood Headers or Girders.
Is FULL HEIGHT of Joist.



FIG. 5069



FIG. 5070

STYLE B
For Brick Wall.

Is about ONE-HALF the height of the Joist, and therefore lower priced than Style BI, which as shown below is FULL height of Joist.

Length in Wall—For ordinary Joist $4\frac{1}{4}$ inches. For extra heavy Timbers $8\frac{1}{2}$ inches.

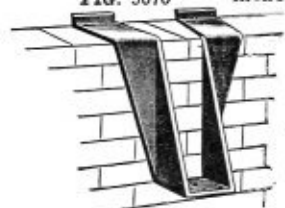


FIG. 5072

STYLE BI

For Brick Wall.

Is the same as Style B, except that it is the FULL HEIGHT of the Joist.

Length in Wall—For ordinary Joist $4\frac{1}{4}$ inches. For extra heavy Timbers $8\frac{1}{2}$ inches.

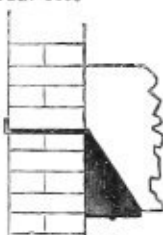


FIG. 5071

STYLE D

For Steel I-Beams.

Is the same as Style BI, except that the hooks are long enough to reach across the top and clinch upon the flange of the I-Beam.

It is also frequently used instead of Style A, for WOOD Girders, the turned-down ends of the hooks being spiked to the back of the Girder.

In ordering Style D, give over-all measurements across TOP, and HEIGHT of I-Beam or Girder, as well as SIZE of Joist.



FIG. 5074

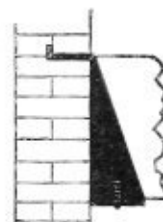


FIG. 5073

STYLE E

(Double Hanger.)

For Steel I-Beams or Wood Girders.

Is the same as two Style A Hangers, riveted to connecting plates, extending across the top of the I-Beam or Girder.

In ordering Style E, give over-all measurements across TOP, and HEIGHT of I-Beams or Girders, as well as SIZE of Joist.



FIG. 5076

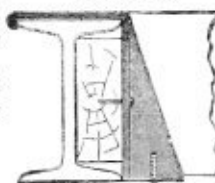


FIG. 5075



FIG. 5077

For Joists set at angles, use Hangers 1 inch wider; thus for 2-inch Joists set at angles, use 3-inch Hangers.

Above Hangers made for all sizes of Joists. Prices upon application.

EXPANDED METAL REINFORCEMENT



FIG. 5078

A standard reinforcement for concrete; convenient to handle and place, and used largely in concrete sewers, conduits, short span floors, culverts, bridge floors and sidewalks.

The small size mesh is used for window guards and to form partitions and railings, and can be furnished painted for such use.

Styles	Approx. Weight Per Sq. Ft. in Pounds	Prices in Cents Per Square Foot				Standard Size Sheets	
		Car Loads	10,000 Feet to Carload	2,000 to 10,000 Feet	Under 2,000 Feet	Lengths	Widths
						Long Way of Diamond	Short Way of Diamond
3-10-176	.60	10.00	11.00	12.00	13.00	6', 8', 9', 10'-8"	3', 4', 5', 6'
3-10-265	.90	14.80	16.30	17.80	19.20	6', 8', 9', 10'-8"	4', 5'-4"
3-10-353	1.20	19.30	21.20	23.20	25.10	6', 8', 9', 10'-8"	3', 4', 6'
3-12-150	.51	8.80	9.70	13.60	11.40	6', 8', 9', 10'-8"	3', 4', 6'
1½-12-194	.66	14.20	15.60	17.00	18.50	6', 8'	3', 4', 6'
¾-12-246	.84	16.80	18.50	20.20	21.80	6', 8'	3', 4', 6'
3-10-324	1.10	17.30	19.00	20.80	22.50	6', 8', 9', 10'-8"	4'-4"
3-10-25	.85	14.40	15.80	17.30	18.70	6', 8', 9', 10'-8"	5'-8"
3-10-20	.68	11.50	12.70	13.80	15.00	6', 8', 9', 10'-8"	5'-6"
3-10-162	.55	9.10	10.00	10.90	11.80	6', 8', 9', 10'-8"	3', 4'-6"
3-10-15	.51	8.80	9.70	10.60	11.40	6', 8', 9', 10'-8"	3', 6'
3-12-125	.425	7.60	8.40	9.10	9.90	6', 8', 9', 10'-8"	4'-4", 6'-6"
3-12-10	.34	6.40	7.00	7.70	8.30	6', 8', 9', 10'-8"	4', 6'-4"
3-16-082	.278	5.90	6.50	7.10	7.70	6', 8', 10'-8"	3', 4', 5', 6'
3-16-059	.20	4.40	4.80	5.30	5.70	6', 8', 10'-8"	3', 4', 6'
2¼-12-164	.56	9.50	10.50	11.40	12.40	6', 8', 10'-6"	4', 5'
2¼-16-118	.40	7.40	8.10	8.90	9.60	6', 8', 10'-6"	3', 4', 6'
2¼-16-10	.34	6.40	7.00	7.70	8.30	6', 8', 10'-6"	4', 5'
2-12-161	.547	12.40	13.60	14.90	16.10	6', 8'	4', 5'
2-16-103	.351	6.70	7.40	8.00	8.70	6', 8'	4', 5'
1½-12-181	.61	13.70	15.10	16.40	17.80	6', 8'	4'-3"
1½-16-105	.36	10.70	11.80	12.80	13.90	6', 8'	4', 5'
1½-18-088	.308	9.80	10.80	11.80	12.70	6', 8'	3', 6'
1-12-234	.796	16.20	17.80	19.40	21.10	6', 8'	4'-8"
1-16-175	.597	12.50	13.80	15.00	16.30	6', 8'	3', 4', 6'
1-18-125	.425	10.60	11.70	12.70	13.80	6', 8'	4'-4"
¾-16-154	.525	12.50	13.80	15.00	16.30	6', 8'	4'-4"
¾-18-147	.50	12.10	13.30	14.50	15.70	6', 8'	3'-8"
¼-18-220	.75	16.40	18.00	19.70	21.30	6', 8'	4'

Note.—Interpret styles as follows:—For example 3-10-176, "3" equals short dimension of Diamond in inches; "10" equals approximate gage; "176" equals .176 square inches sectional area per foot of width.

We are prepared to give quotations on any of the above meshes in any weight per square foot.

Standard Sheets will be cut once in either direction without charge, if both pieces resulting from cutting are included in the order.

All other sizes are special and will be cut from next larger size standard sheet, charge being made for total number of square feet in standard sheets.

For irregular shaped sheets containing less than 10 square feet, price will be made on application.

We are prepared to quote on painted or enameled expanded metal when requested.

IMPORTANT: When giving size of sheet, name the dimension the long way of the diamond first.

KEY EXPANDED METAL STEEL LATH



FIG. 5079

KEY EXPANDED METAL STEEL LATH—PAINTED

Gage	Approx. Weight Per square yard		Size Sheets	Bundled
	Painted Lbs.	Galv. Lbs.		
27	2.30	2.73	24"x96"=17/9 sq. yd.	15sh. (26 ² / ₃ sq. yd.)
26	2.50	2.94	24"x96"=17/9 sq. yd.	15sh. (26 ² / ₃ sq. yd.)
25	3.05	3.32	24"x96"=17/9 sq. yd.	15sh. (26 ² / ₃ sq. yd.)
24	3.40	3.74	24"x96"=17/9 sq. yd.	15sh. (26 ² / ₃ sq. yd.)
22	4.00	not made	24"x96"=17/9 sq. yd.	15sh. (26 ² / ₃ sq. yd.)

PAINTING—Always furnished painted. No reduction for unpainted.

GALVANIZED—Cut from galvanized sheets, 12c square yard extra.

BREAKING BUNDLES

As our lath is carried in uniform bundles, we do not break them, but ship an even number nearest to—but not less than—the quantity ordered.

If you order:

500 sq. yds.

Style:

Key Lath

We will ship:

19 full bds.=506²/₃ sq. yds.

All Prices in Cents Per Square Yard.

	Steel Lath
27 gage	62.10c
26 gage	64.38c
25 gage	66.58c
24 gage	68.92c
22 gage .....	.....

MCKINNEY FLEXIBLE STEEL DOOR MAT

Partly Rolled



FIG. 5080

Indispensable for residences, store entrances, vestibules, elevators, soda fountains, bars and bar toilets, street cars, railroad coaches, office buildings, churches, schools and all other public and private buildings, theaters, steamship and furnace rooms. Excels all others in beauty, flexibility and in the usefulness of its wonderful construction. It does not mar tile, marble, wood or linoleum, is a perfect scraper, and does not curl up at the corners. It conforms to uneven surfaces and is easily cleaned. It is reversible, sanitary and the most durable mat on the market.

No.	List Price Single Mat	Dimensions of Mats Inches	Net Weight of Mat Each, Lbs.
2	\$ 1.50	15½x23½	5
3	2.00	17¼x30	7
4	3.00	21½x36	10½
5	4.50	25½x48	16½
6	5.25	30 x48	19
7	6.50	34 x50	22
8	8.00	36 x60	28½
9	10.00	36 x72	34½



FIG. 5081

PAPER BURNERS

Made of galvanized wire, crimped and with heavy iron supports that serve as side braces as well as legs. A well constructed serviceable burner—moderate in price.

Nos.	3	21½	2	1
Diameter .....inches	20	18	15	14
Height .....inches	35	30	28	20
Each	\$8.00	6.00	4.00	3.50

"PARAMOUNT" ROOFING



FIG. 5082

There is no part of a building, whether it is a costly edifice or a modest structure, more important than the roof, and no style of roof covering has so rapidly increased in use as has ready or prepared roofings.

Ready roofing, like all building materials, gives service commensurate with its ability to resist deterioration and this admitted fact forms the basis of our argument for the superiority of **PARAMOUNT ROOFING**. That it should provide efficient service for a period long in excess of that which could be expected from any other ready roofing, is solely due to the water-proofing agent employed in its manufacture.

Trinidad Lake Asphalt is the most wonderful of all bituminous materials. It is a natural product, has been exposed to climatic changes and the action of the elements for centuries, and is remarkable for its uniformity, weather resistance and adaptability as a roofing product. It is this which gives life to **PARAMOUNT Roofing** and far removes it from the competition of the low price roofings made from inferior materials, often referred to by their manufacturers as "secret compounds."

PARAMOUNT Roofing is made in three types—smooth, slate and gravel surface.

Smooth Surface

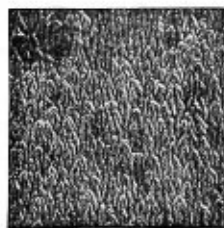


FIG. 5083

Slate Surface

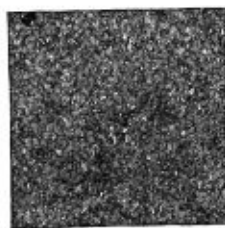


FIG. 5084

Gravel Surface

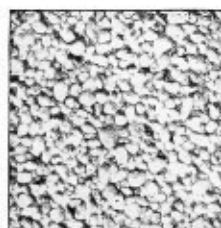


FIG. 5085

Each roll of **PARAMOUNT Roofing**, 2-ply and 3-ply, bears label of the Fire Underwriters' Laboratories.

"PARAMOUNT" ROOFING—CONTINUED

KANT-LEAK KLEET APPLIED



FIG. 5036

With the gravel surface, large head galvanized nails and cement are furnished, while with **PARAMOUNT** Smooth and Sanded Roofings we provide another extremely important feature which no roofing buyer can afford to overlook. This is the Kant-leak Kleet, as illustrated, an exceedingly efficient device which absolutely seals the laps without the use of liquid lap cement and large-head nails, and caps. It makes seams absolutely water-tight. It prevents bulging and makes leaks impossible from nails driven in cracks. It gives a firm, even surface that makes the roof positively wind-proof, buckle-proof and proof against rain, smoke or fumes driving their way to the under surface of the roofing. Kant-leak Kleets are packed in each roll, as illustrated. Round wooden blocks hold the Kleets in place and also prevent the roll from collapsing.



FIG. 5087

PARAMOUNT Slate Roofing is furnished in two colors—red and green, resulting in a very attractive roofing. This, as well as **PARAMOUNT** Gravel Surface Roofing, has fire resisting properties, a feature of merit in addition to their weather resistance.

"PARAMOUNT" SMOOTH SURFACE

Price List per Roll Containing 108 Square Feet, 32 Inches Wide.

Ply	1	2	3
Price per roll.....	\$3.40	\$4.20	\$5.00
Weight per roll.....	lbs. 35	46	56

"PARAMOUNT" SLATE SURFACE

List price.....	per roll 108 square feet	\$3.70
Weight per roll.....	lbs. 85 to 90	

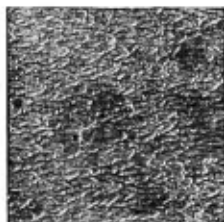
"PARAMOUNT" GRAVEL SURFACE

List Price per roll 112 square feet.....	\$3.80
Weight per roll.....	lbs. 115

Smooth Surface Roofing should be painted about one year after applying and every two or three years thereafter. Slate Roofing or Gravel Roofing requires no painting. Each roll contains necessary nails, kleets, caps and cement, also printed instructions for laying, and a five-year guarantee.

"FORT PITT" RUBBER ROOFING

Smooth Surface

**FIG. 5088****FIG. 5089**

"FORT PITT" Rubber Roofing is a roofing material of a moderate price and high quality. It is manufactured from a good grade of felt, waterproofed with a native asphalt, the combination resulting in a roofing capable of giving service exceeded only in length by Paramount Roofing, described on preceding pages.

"FORT PITT" Roofing should not be confused with the many low-priced, irresponsible roofings now on the market which cannot compare with it in merit. So well has it proven its worth that we have no hesitation in recommending it as providing exceptional value for its cost.

It is applicable for use on flat or steep roofs and provides an economical roof covering easily applied by workmen of ordinary intelligence.

"FORT PITT" Roofing is made in three weights, known as one, two and three-ply, all of which are stocked constantly by us.

List Price Per Roll Containing 108 Square Feet, 32 Inches Wide.

Smooth Surface.....	ply	1	2	3
Price per roll.....		\$2.30	\$3.00	\$4.70
Weight per roll.....	lbs.	35	45	55

Each roll of 2-ply and 3-ply bears label of the Fire Underwriters' Laboratories.

The above roofing should be painted about one year after applying, and every two years thereafter. Each roll contains necessary caps, nails and cement, also printed instructions for laying, and a five-year guarantee.

PARAMOUNT ASPHALT SHINGLES

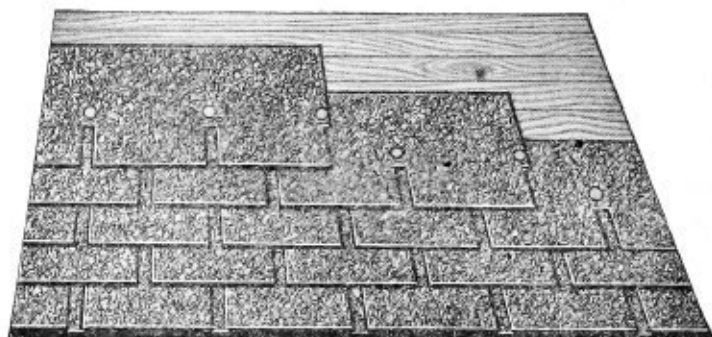


FIG. 5090

These materials combine weatherproofing qualities with an attractive appearance and great resistance to fire.

PARAMOUNT Asphalt Shingles are made of a high-grade felt waterproofed with Trinidad Lake Asphalt, which alone raises them above competition, but they have a further point of merit possessed by none of the low-priced asphalt shingles, which is the coated back feature. The heavy coating of asphalt on the underside of **PARAMOUNT** Shingles resists disintegration which might otherwise result from condensation and is a factor in the superior resistance to wind pressure which these shingles hold.

PARAMOUNT Asphalt Shingles are surfaced with Red and Green finely crushed slate, which results in an extremely handsome roof. The slate is natural and the shade, therefore, permanently retained.

PARAMOUNT Asphalt Shingles are $8 \times 12\frac{3}{4}$ inches in size; they are laid with four inches exposed to the weather; 424 shingles are sufficient to cover 100 square feet. Shipment is made in packages containing 212 shingles. Weight per square, about 220 pounds.

Price per square \$.....

PARAMOUNT Strip Shingles are constructed identically as are **PARAMOUNT** Individual Shingles, but are furnished in strips $10 \times 32\frac{1}{2}$ inches, $\frac{1}{2}$ -inch slots, 4 inches deep, are cut along one edge giving the appearance of four shingles. Laid four inches exposed to the weather; 112 strips are sufficient to cover 100 square feet. Shipment is made in packages containing 56 strips. Approximate weight per square, 190 pounds.

Price per square \$.....

PREPARED TAR ROOFING

(COMMONLY CALLED TAR PAPER)



FIG. 5091

Tar Paper requires coating, and this is a point that should not be neglected. A proper coating when roofing is laid will repay doubly in service and an occasional recoating thereafter will keep your roof in perfect condition for many years. Is made 32 inches wide and put up in rolls containing 108 square feet, or enough to cover 100 square feet and allow for the necessary 2-inch lap.

List prices, 2-ply.....per square \$1.00
List prices, 3-ply.....per square 1.30

RED ROSIN SIZED SHEATHING



FIG. 5092

No. 8. A 3-ply red rosin sized sheathing, made from first-class stock, good color, smooth calendar finish. One pound will cover 8 square feet. In rolls of 500 square feet, weighing about 60 lbs.

Priceper roll \$.....

No. 12. A 3-ply red rosin sized sheathing, made from good stock. One pound will cover 12 square feet. In rolls containing 500 square feet, weighing about 40 lbs.

Priceper roll \$.....

No. 10. A 3-ply red rosin sized sheathing, smooth finish, good stock. One pound will cover 16 square feet. In rolls 500 square feet, weighing 30 lbs. (about).

Priceper roll \$.....

No. 20. A 3-ply red rosin sized sheathing. Made from good stock. One pound will cover 20 square feet. In rolls of 500 square feet, weighing about 25 lbs.

Priceper roll \$.....

No. 25. Solid red rosin sized sheathing, combines light weight and low price with great covering capacity. One pound will cover 25 square feet. In rolls 500 square feet and weighing about 20 lbs.

Priceper roll \$.....

GRAY ROSIN SIZED SHEATHINGS

No. 12. Weighing about 40 lbs. to roll of 500 square feet. One pound will cover 12 square feet; 36 inches wide.

Priceper roll \$.....

No. 20. Weighing about 25 pounds to roll of 500 square feet. One pound will cover 20 square feet; 36 inches wide.

Priceper roll \$.....



FIG. 5093

SLATERS FELT

Used extensively under tile, slate, shingles, etc., and also for sheathing; made 36 inches wide. Put up in rolls containing 500 square feet weighing about 35 pounds.

Per roll.....\$1.12

TIN ROOFING CAPS

One inch diameter. Packed as follows:

10-lb. boxes, price.....per lb \$0.15
25-lb. boxes, price.....per lb. .14
50-lb. kegs, price.....per lb. .12
350-lb. barrels, price.....per lb. .10



FIG. 5094



FIG. 5095

REFINED COAL TAR

Refined Coal Tar is the entire product of pure coal tar from which only the water has been taken off in distillation. Refined Tar is put up in well-coopered barrels containing 50 gallons; weight, including package, about 570 pounds.

Per barrel.....\$7.50

PINE TAR

In barrels of 50 gallons each.....per barrel \$20.00



FIG. 5096

ROOF COATING

It protects new roofs and prolongs the life of old roofs. Put up in any size package ready for the brush. Two gallons will coat 100 square feet twice. Weight, including package, about 12 pounds per gallon. Sold by the gallon.

Per gallon.....\$0.40

ROOFING PITCH

This pitch is made in several consistencies as best adapted for different purposes, but none of the valuable properties of the tar are removed in the process of distillation.

Per 100 pounds.....\$1.25

PITCH MOPS

With Wood Handles.

List.....per dozen \$....



FIG. 5097

PITCH LADLES

Tin, improved pattern....list per doz. \$....

Iron, improved pattern....list per doz.

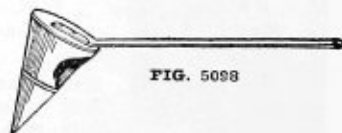


FIG. 5098

With Guards

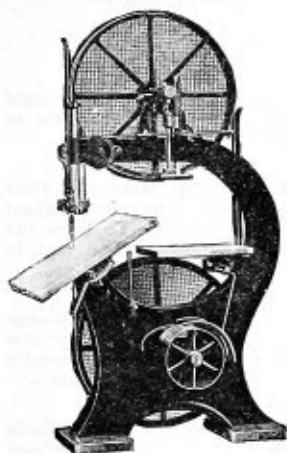


FIG. 5099

Without Guards

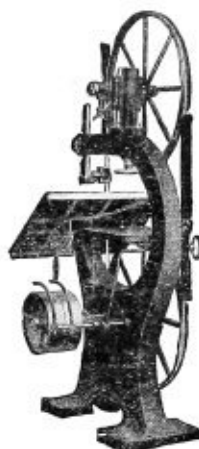


FIG. 5100

BAND-SAWS

20-Inch iron band wheels turned perfectly true and balanced. The endless rubber bands are securely cemented to the rims of the wheels. The upper wheel can be adjusted in any direction while machine is running, to keep saw in proper alignment. Has up and down adjustment of several inches to accommodate saws of different lengths. The universal adjustment of this wheel will enable the user to lead the blade to any point on the face of the wheel.

SAW BLADES

One blade $\frac{3}{8}$ in. No. 21 gage, 10 feet 1 inch long, set and sharpened ready for use, is furnished with each 20-inch machine. Hardwood guides, brazing clamp and tongs are also included with each saw.

PULLEYS

Tight and loose pulleys, 7 inches diameter for 3-inch belt. A belt shifter and lever is provided as shown; no countershaft required.

TABLE

Size 18x22 inches, made of cast iron planed true on top and heavily ribbed to prevent warping. Distance between saw and frame, 20 inches; height under saw guide, when up, 7 inches; floor space, 20x34 inches.

SPEED

350 to 450 revolutions per minute.

Shipping weight, 440 pounds.

PRICES, 20-INCH MACHINE

For power only.....	price	\$75.00
With foot treadles (no pulleys).....	price	85.00
With foot treadles and pulleys for power.....	price	90.00

PRICES BAND SAW BLADES FOR 20-INCH MACHINE

$\frac{1}{4}$ inch.....	\$2.30	$\frac{3}{8}$ inch.....	\$2.40
$\frac{1}{2}$ inch.....	2.50	$\frac{1}{2}$ inch.....	2.80
$\frac{3}{4}$ inch.....	3.00	1 inch.....	3.60

For larger size machines, see following page.

BAND SAWS—CONTINUED

26-INCH, 32-INCH, 36-INCH AND 38-INCH MACHINES

MAIN FRAMES

The frames are all cast hollow in one piece, making the machines very rigid and substantial. There is just the proper distribution of metal in all parts to make the machines steady running under all conditions.

BAND WHEELS

The wheels are made of cast iron turned perfectly true and balanced. They are covered with endless rubber bands of the best quality. The upper wheel may be adjusted in any direction while the machine is running. To keep the saw in proper alignment. There is several inches up and down adjustment to accommodate saws of different lengths.

SAW GUIDES

The guide above the table is Wright's patented non-friction guide. Manufacturers claim that the use of this guide materially increases the life of the saw blades. The guide below the table is a plain steel face guide, but when specially ordered the machine will be furnished with Wright's guide below the table.

SPRING TENSION

The upper wheel and shaft rests on the tension spring that is placed inside the upper arm of the frame. This spring equalizes the tension of the saw blades and prevents the blade from breaking in case a stick of wood should get in between the saw and the wheel.

LOWER SHAFT

The lower shaft is bored and plugged so as to form an oil chamber. Small holes are drilled through the shaft where the loose pulley runs allowing oil to feed through the shaft and keep the pulley lubricated.

TABLES

The tables are made of iron planed perfectly smooth on top. They are heavily ribbed to prevent warping. The edges are beautifully polished. The table may be tilted to any angle up to 45 degrees, a graduated brass scale showing when any desired angle has been reached. A stop is provided for quickly returning table to square. The table may be securely clamped in any position by means of an eccentric lever.

GENERAL CONSTRUCTION

These machines are constructed throughout in the best possible manner. They are well finished, and we offer them to you with the confidence that we are giving you the best machine that can be had for the money.

Dimensions.....	26-inch	32-inch	36-inch	38-inch
Size of wheels.....inches	26 x 1½	32 x 1¾	36 x 2	38 x 2
Distancesaw to frame.inches	26	32	36	38
Height under guide.....inches	9	13	17	19
Size table, iron.....inches	20 x 24	24 x 28	28 x 32	30 x 36
Size tight and loose pulley.....inches	10 x 3	12 x 3½	12 x 4	16 x 4
Speed.....R. P. M.	450	450	450	450
Length of saw blades.....	13 ft. 9 in.	16 ft. 4 in.	18 ft. 6 in.	20 ft. 4 in.
Height, over all.....inches	78	81	92	102
Floor space, over all.....inches	30 x 40	35 x 48	39 x 57	44 x 62
Shipping weight.....pounds	700	900	1200	1475
Price.....	\$120.00	160.00	200.00	255.00

EQUIPMENT

Each machine is furnished with one anti-friction roller saw guide above table, one plain guide below table, one brazing tongs, one brazing clamp, and one saw blade any width up to 1-inch.

CRESCENT JOINTERS

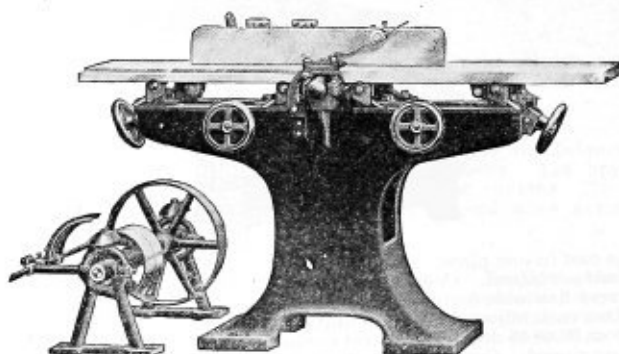


FIG. 5103

Jointers should always be provided with safety guard and round head, when they are in the hands of inexperienced operators. Crescent jointers have both of these features. The round head adds a little to the cost, but when the square head is desirable it can be furnished.

Sometimes a jointer is called a buzz planer or a hand planer.

These jointers have the frame cast in one piece, making the machine very strong and rigid for a given weight. This construction is also much more desirable and far more substantial than jointers having the frames bolted together.

The tables are made of iron planed true. Each table may be adjusted vertically or may be pulled away from the head without disturbing the other.

Dimensions	8-inch Jointer	12-inch Jointer	16-inch Jointer	18-inch Jointer	20-inch Jointer	24-inch Jointer
Length knives	8	12	16	18	20	24
Size flanged pulley on head .. in.	3½ x 2½	4 x 4½	4 x 4½	4 x 4½	4 x 4½	4 x 4½
Widest belt that should be used	2½	4	4	4	4	4
Size tight and loose pulley .. in.	8 x 3	10 x 5	10 x 5	10 x 5	10 x 5	10 x 5
Speed countershaft per minute	900	800	800	800	800	800
Giving head speed of	4000	4000	4000	4000	4000	4000
Floor space exclusive countershaft	21 x 64	31 x 84	35 x 84	37 x 84	39 x 84	43 x 84
Shipping weight	80	1375	1525	1625	1700	1800
Price, with safety head, solid lips	220.00	255.00	285.00	300.00	315.00	345.00
Price, with safety head, steel lips	230.00	270.00	305.00	320.00	340.00	375.00

EQUIPMENT

Each machine is furnished with one pair of (two) knives, one countershaft, one fence, one pressure spring, one wrench, and one safety guard to prevent accident to operator.

CRESCENT PLANER AND MATCHER

No. 324

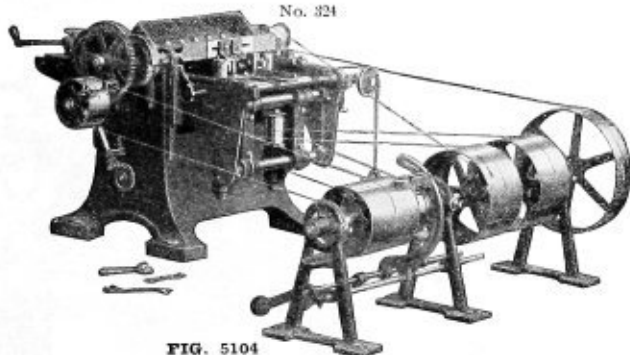


FIG. 5104

This machine is constructed on the same general lines as the 24-inch Crescent planer, but with the necessary modifications to adapt it for matching. The frame, the feed, the chip-breaker and pressure bar are just the same. The table, countershaft and head are somewhat different.

The head is suited for two planer knives; also slotted on the other two sides for attaching special knives for making molding, beading, siding, etc. There is a clearance of one-half inch for such cutters between the head and the chip-breaker and pressure bar.

The matcher heads are made of bronze, mortised to admit knives, $2\frac{1}{2}$ inches wide 5-16 inch thick. They are suited for matching, or edging up lumber either square or molded edges. By loosening a set-screw they are readily lifted from their spindles, and the end of spindle is entirely below the surface of the table, out of the way for planing.

The countershaft is placed to rear of the machine, on the floor. It cannot be used in any other position. It should be placed at least 96 inches from center of head to center of countershaft. The length of belts and floor space given below are based on this distance. The countershaft can be belted in any direction to line shaft and is provided with a convenient shifter.

The change from matcher to planer is readily and quickly made, requiring but a few minutes' time.

Other Features. The feed must be driven from countershaft—cannot be driven from the head. The lower rolls are adjustable for height, and for lateral alignment so stock can be made to feed through straight. The machine cannot be made double belted, nor with lower rolls driven.

DIMENSIONS

Width and thickness will match, 12x2 inches.

Minimum thickness will match, $\frac{3}{8}$ inch.

Width and thickness will plane, $23\frac{3}{4}$ x6 inches.

Floor space, including countershaft, 67x132 inches.

Size of tight and loose pulley, 10x5 inches.

Speed of countershaft, per minute, 825 revolutions.

Giving planer head speed, per minute, 4,000 revolutions.

Giving matcher head speed, per minute, 3,300 revolutions.

Length of 2-inch feed belt, 18 feet 1 inch.

Length of 2-inch matcher belts, each, 15x10 inches.

Length of 4-inch drive belt, 19 feet 3 inches.

Domestic shipping weight, 1,900 pounds.

Price\$525.00

Equipment.—Each machine is furnished with countershaft, pair of two planer knives, pair of matcher heads, with knives for matching $\frac{3}{4}$ -inch flooring, two steel wrenches and one wrench for holding matcher heads. No belts furnished.

26 x 8-INCH CRESCENT SURFACER-VARIABLE FEED

This machine is built to meet the requirements of those users who want a tool larger and heavier than the 24-inch Crescent Planer. The machine is heavy and yet compact in design, requiring a small amount of floor space. At the same time it will handle lumber up to 26 inches wide by 8 inches thick. The machine is built with all four feed rolls driven and with flanged pulley on each end of head for two drive belts.

The variable feed permits of instant change of feed from 15 to 60 lineal feet per minute, a scale and pointer indicating the number of feet per minute the machine is surfacing.

Pressure for the upper feed roll is by means of a spring on which the tension may be increased or decreased as the work requires, so that the required amount of pressure is always available. This method of adjusting the tension on the infeeding roll is more convenient and more rapid than shifting a weight on a lever. Any amount of pressure up to 600 pounds is instantly available. Additional pressure may be given quickly when needed by means of a pair of foot-levers. The spring pressure is flexible, is quick in action and does not give the machine that pounding strain that is common where the pressure is had by means of weights. Any customer who after a trial would prefer to have the weights to take the place of springs may have them free of charge.

The head is equipped with two knives but four sided heads will be furnished when so ordered, the only extra charge being for the two additional knives, and bolts required for attaching them.

The countershaft may be placed on the ceiling above machine, on the floor back of machine or below the floor.

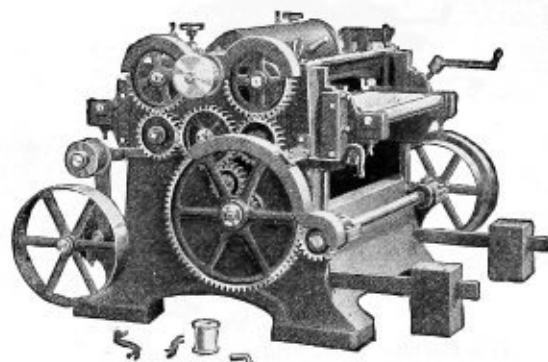


FIG. 5105

DIMENSIONS

Width and thickness will plane.....	26"x8"
Shortest stock will plane.....	14"
Width of drive belts.....	4"
Diameter of pulleys on head.....	5"
Size tight and loose pulleys.....	10"x6"
Speed of countershaft, per minute.....	1,000 rev.
Giving speed of head, per minute of.....	4,000 rev.
Length of feed belt (2 1/4 inches wide).....	8' 4"
Length of table.....	52"
Center to center of feed rolls.....	14"
Diameter of upper feed rolls.....	4"
Diameter of lower feed rolls.....	3 1/4"
Floor space, exclusive of countershaft.....	59"x69"
Power required.....	8 to 10 H.P.
Domestic shipping weight.....	3,000 lbs.
Telegraphic code word.....	Meord
Price.....	\$500.00

Regular equipment. Each machine is furnished with countershaft, having self-oiling loose pulley, one pair of two knives, two wrenches. No belts furnished.

CRESCENT SAW GUARD



FIG. 5106

This new saw-guard is readily attached to any of the Crescent Saw-Tables, and will not interfere with the operating of the tilting tables. When in position it will completely cover the saw, guarding against the possibility of getting the hands into the saw, or of strips of wood being thrown by getting on top of the saw. The heavy steel arm that overhangs the table is fastened to the rear part of the machine, where it does not interfere with the work in cutting off long pieces.

The Guard, or cage, is hung on two parallel arms and counterbalanced by a spring in such a manner that the guard yields easily, allowing the lumber to pass under it through the saw in a normal manner. When the lumber has passed through, the guard will return to the table of its own weight and completely cover the saw.

In special work it is often desirable to remove the guard so as to clear the saw. For ordinary clearance the guard is simply pushed up against the supporting bracket, when a spring latch will snap in and hold it in that position. Another touch on the latch is all that is needed to bring the guard down over the saw again.

When more clearance is needed, the guard may be swung into an inverted position and is again held in place by another spring latch at the front end of the supporting arm. To make either of these adjustments will require but a few seconds of time.

When it is desired to have all the space above the table cleared, this may easily be done by loosening two cap screws, when the entire arm may be swung clear of the space above the table.

It is adapted to use on the various Crescent Saw-Tables, also for the saw-tables of the Crescent Wood-Workers. When made to fit machines of other make, a measurement blank for giving the necessary dimensions will be furnished on request.

Weight	pounds 140
Price for Crescent Saw-Tables	\$40.00
Price for other makes	60.00

18-INCH CRESCENT DISK GRINDER

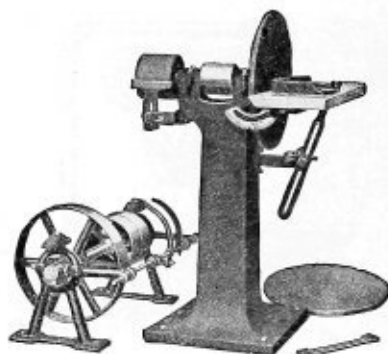


FIG. 5107

This is a machine that will soon pay for itself in any pattern shop, wood-working shop, or machine shop. For use on wood, it will do work similar to a wood trimmer, but will face off larger surfaces and do it more quickly and accurately. In a metal-working shop it will do a large part of the file work at a saving of time and files. By using an emery-wheel on back end in place of drum it makes a handy grinder. Machine will take emery-wheel 10 inches diameter, 1-inch face, 1-inch hole. The table is adjustable for any angle from 45 degrees downward to 45 degrees upward, a graduated scale indicating the angle. To set the table square, a stop is provided to make this adjustment quickly, without referring to index. Table can easily be removed entirely for changing disks. The bearings are well made, having oil chamber with capillary felt and self-closing oil-cups. The mandrel is made of steel with pulley shrunk on and collars milled on solid. The bearings are ground absolutely true. For wood-working, the disk and drum are to be covered with garnet paper, while for metal-grinding emery paper may be used. The paper can be changed with very little trouble. The old paper can be removed with a sharp corner of an old file while machine is running. A coat of shellac is then spread on the iron disk and also a coat of shellac on back side of the paper circle. Place the paper circle on the disk and lay on a perfectly true surface, paper side down, till the shellac is dry; the weight of the disk will hold paper in contact while shellac sets. Machine is furnished with two disks and a convenient way is to treat both disks at the same time, placing one disk on top of the other with paper between, till shellac hardens.

DIMENSIONS

- Diameter of disk, 18 inches.
- Size of table, 10x24 inches.
- Diameter and face of drum, 6x5 inches.
- Width of belt for mandrel, 3 inches.
- Size of tight and loose pulleys, 8x3 inches.
- Speed of countershaft, per minute, 400 revolutions.
- Speed of disk, per minute, 1,400 revolutions.
- Floor space required, over all, 24x27 inches.
- Cubic measure, boxed for export, 16 feet.
- Gross weight, boxed for export, 550 pounds.
- Domestic shipping weight, 475 pounds.
- Telegraphic code word, Nepot.

Price \$120.00

Equipment.—Each machine is equipped with two disks, one drum, one segment-stop, one angle-gauge and the countershaft.

Belt Driven



FIG. 5108

SWING CUT-OFF SAW

Motor Driven



FIG. 5109

The frame is cast in one piece, cored out hollow. There may be cheaper ways of making frames, but none better. The mandrel is carefully made of steel, with pulley shrunk on solid. The bearings for mandrel are ground absolutely true. They are $1\frac{1}{2}$ inches in diameter, 5 inches long, and are provided with a self-oiling capillary felt to feed oil as required. The hangers are adjustable, making it a very simple matter to properly level up the machine. The frame is hung to the hangers in such a manner that it is impossible for the weight of the frame to ride on the shaft, insuring shaft to work free and easy. And a very useful feature of this machine is the convenient arrangement of the belt-shifter. A self-locking shifter is used. The belt cannot creep from one pulley to the other and shifter handle is located convenient to operator. The shifter is reversible so that the machine can be belted to line shaft either in front or to rear of machine.

When specially so ordered, the machines can be furnished with wall brackets (instead of hangers), to suit for hanging the machine to wall instead of ceiling, there being no extra charge for this arrangement.

The machine is made in six sizes, viz.: $5\frac{1}{2}$, 6, $6\frac{1}{2}$, 7, $7\frac{1}{2}$ and 8 feet measured from ceiling to center of mandrel. We furnish either of two sizes of saw shields—one suited for saws 18 inches and under, or one suited for saws 24 inches and under.

DIMENSIONS

Drive pulley.....	18x5 inches
Mandrel pulley.....	5x5 inches
Tight and loose pulleys.....	10x5 inches
Length of 5-inch belt for $6\frac{1}{2}$ and 7-foot machine.....	14 feet 2 inches
Length of 5-inch belt for $7\frac{1}{2}$ and 8-foot machine.....	16 feet 2 inches
Speed of countershaft, per minute.....	550 revolutions
Making speed for 18-inch saw of.....	2000 revolutions
Size hole in saws.....	$1\frac{1}{8}$ inches
Cubic measure, boxed for export.....	18 feet
Gross weight, boxed for export.....	600 pounds
Domestic shipping weight.....	450 pounds
Price, $6\frac{1}{2}$ and 7-foot for motor drive (motor not included).....	\$ 70.00
Price, other lengths, for motor drive (motor not included).....	105.00
All sizes of machines same price for belt power.....	70.00

Each machine is furnished with one saw shield, one mandrel wrench and belt-shifter. Unless otherwise specified, all orders will be filled with the $6\frac{1}{2}$ -foot machine, with 18-inch saw shield without saw or belt.

CRESCENT UNIVERSAL WOOD WORKER

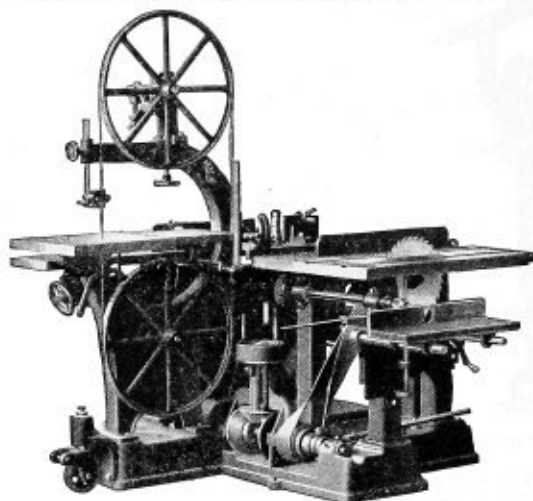


FIG. 5110

The regular machine may be ordered with a 26 or 32-inch band saw, or without any band saw. The jointer may be either 8, 12 or 16-inch.

Machine number ...	51	52	53	54	55	56	57	58	59
Jointer, inches cut...	8	8	8	12	12	12	16	16	16
Band saw, size wheel	26	32	none	26	32	none	26	32	none
Floor space, over all	75x80	83x80	68x80	75x86	83x86	68x86	75x90	83x90	69x90
Shipping weight ...	3,200	3,300	2,900	3,325	3,425	3,025	3,450	3,550	3,150
Price, regular	\$625.00	\$655.00	\$505.00	\$660.00	\$700.00	\$540.00	\$690.00	\$730.00	\$570.00

At price given, machine on cars at factory in Ohio.

Equipment of Regular Machine.—The jointer is equipped with a pair of (two) knives, one fence, one hold-down spring, jointer guard and one wrench. The shaper is equipped with a pair of 2-inch straight knives, two guide pins, collars to fill the spindle, two throat collars, one wrench, one hold-down spring, one hold-over spring, one short fence and one pin to hold spindle. The saw table is equipped with a 12-inch rip saw, one ripping fence and one cut-off gage. The borer is equipped with a self-centering chuck, and sliding table (no bits). The band saw is equipped with one non-friction guide, one plain guide, brazing clamp, brazing tongs and one saw blade. Leather belting is included for driving each of the machines. The main drive belt from line shaft or from motor is not furnished. The above parts are all included regularly with each machine.

Special equipment can be furnished as follows, at prices indicated: Ripping fence for band saw, \$15; guards for band saw wheels, pair \$18; re-saw gage for band saw, \$30; tenoning attachment for shaper, \$30; panel raiser attachment for shaper, \$35; saw guard for saw table, \$40; No. 4 Dado head, \$20; knife grinder attachment, \$15; disk grinder attachment, \$12; plain emery wheel attachment, \$12; hollow chisel mortiser attachment, \$27; set of three square hollow chisels with bits to fit $\frac{3}{8}$, $\frac{1}{2}$ and $\frac{5}{8}$ inch, \$16.50.

The machine can be belted from above or from below, or from rear or on an angle between these points. The average amount of power required for running is from 5 to 7 horsepower. If four of the machines are used all at the same time, about 10 horsepower will be required. The main drive pulley is 10 inches diameter, 6 inch face and is to run 1,120 revolutions per minute.

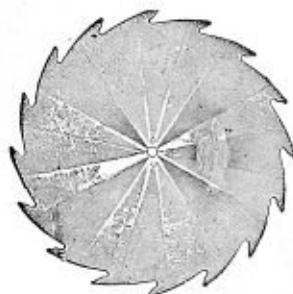


FIG. 5111

CIRCULAR SAWS

SOLID TOOTH

Circular, Edger, Rip and Cut-off.

Diameter, Inches	Thickness, Gauge	Size Hole, Inches	Price Each	Extra for Each Gauge Heavier	Beveling New Saws, Per Gauge	Net Prices Extra for Setting and Sharpening It		Diameter, Inches	Thickness, Gauge	Size Hole, Inches	Price Each	Extra for Each Gauge Heavier	Beveling New Saws, Per Gauge	Net Prices Extra for Setting and Sharpening It	
						Rip	Cross- cut							Rip	Cross- cut
1	24	$\frac{3}{8}$	\$1.00	\$0.01	\$0.06	\$0.03	\$0.04	36	9	$1\frac{1}{8}$	\$31.00	\$1.80	\$1.70	\$0.55	\$0.70
1	24	$\frac{3}{8}$	1.00	.01	.07	.03	.05	38	9	$1\frac{1}{8}$	35.00	2.00	1.85	.60	.75
2	22	$\frac{3}{8}$	1.00	.01	.08	.04	.05	40	9	$1\frac{1}{8}$	41.00	2.30	2.00	.65	.80
2	22	$\frac{3}{8}$	1.00	.02	.09	.04	.06	42	8	$1\frac{1}{8}$	47.00	2.60	2.20	....	.85
3	21	$\frac{1}{2}$	1.00	.02	.10	.05	.06	44	8	$1\frac{1}{8}$	55.00	3.00	2.40	..	.90
3	20	$\frac{1}{2}$	1.00	.03	.12	.05	.07	46	8	$1\frac{1}{8}$	65.00	3.50	2.60	....	1.00
4	19	$\frac{1}{2}$	1.20	.03	.14	.06	.07	48	8	$1\frac{1}{8}$	75.00	4.00	2.80	....	1.10
5	19	$\frac{3}{4}$	1.50	.04	.16	.06	.08	50	7	$1\frac{1}{8}$	85.00	4.50	3.00	....	1.20
6	18	$\frac{3}{4}$	1.80	.05	.18	.07	.10	52	7	$1\frac{1}{8}$	95.00	5.00	3.25	....	1.30
7	18	$\frac{3}{4}$	2.10	.06	.20	.08	.11	54	7	$1\frac{1}{8}$	105.00	6.00	3.50	....	1.40
8	18	$\frac{7}{8}$	2.40	.08	.22	.10	.13	56	7	$1\frac{1}{8}$	120.00	7.00	3.75	....	1.50
9	17	$\frac{7}{8}$	2.80	.10	.25	.11	.14	58	7	$1\frac{1}{8}$	135.00	8.00	4.05	....	1.60
10	16	1	3.30	.12	.28	.12	.16	60	6	$1\frac{1}{8}$	150.00	9.00	4.35	....	1.70
11	16	1	3.90	.16	.30	.13	.18	62	6	$1\frac{1}{8}$	170.00	10.00	4.65	....	1.80
12	15	1	4.40	.20	.35	.15	.20	64	6	$1\frac{1}{8}$	190.00	12.00	5.00	....	1.90
14	14	$1\frac{1}{8}$	5.30	.25	.40	.18	.23	66	6	$1\frac{1}{8}$	210.00	15.00	5.35	....	2.00
16	14	$1\frac{1}{8}$	6.50	.30	.50	.20	.25	68	5	$1\frac{1}{8}$	235.00	18.00	5.75	....	2.10
18	13	$1\frac{1}{8}$	8.00	.40	.60	.23	.28	70	5	$1\frac{1}{8}$	265.00	21.00	6.15	....	2.20
20	13	$1\frac{1}{8}$	9.50	.50	.70	.25	.32	72	5	$1\frac{1}{8}$	300.00	24.00	6.55	....	2.30
22	12	$1\frac{1}{8}$	11.50	.60	.90	.28	.35	74	5	$1\frac{1}{8}$	340.00	27.00	7.00	....	2.40
24	11	$1\frac{1}{8}$	13.50	.70	.90	.31	.40	76	5	$1\frac{1}{8}$	390.00	30.00	7.50	....	2.50
26	11	$1\frac{1}{8}$	16.00	.85	1.05	.35	.45	78	5	$1\frac{1}{8}$	465.00	34.00	8.10	....	2.60
28	10	$1\frac{1}{8}$	18.50	1.00	1.20	.38	.50	80	5	$1\frac{1}{8}$	550.00	38.00	8.80	....	2.70
30	10	$1\frac{1}{8}$	21.00	1.15	1.30	.42	.55	82	5	$1\frac{1}{8}$	640.00	43.00	9.60	....	2.80
32	10	$1\frac{1}{8}$	24.00	1.30	1.40	.45	.60	84	5	$1\frac{1}{8}$	730.00	48.00	10.50	....	3.00
34	9	$1\frac{1}{8}$	27.00	1.50	1.55	.50	.65	....	....	....	....	....	....	....	....

Grinding or beveling old saws extra.

No extra charge for saws one gauge thicker than list.

Saws 38 inches and under beveled one gauge without extra charge.

Saws 40 inches and over beveled two gauges without extra charge.

We furnish lathe saws for handle turning machines, and similar work, at special prices.

Saws 48 inches in diameter and larger, thinner than ten gauge, add ten per cent, for each gauge thinner and no warrant.

In ordering state speed, and right or left hand.

**CIRCULAR SAWS
CHISEL TOOTH, NO. 33**



FIG. 5112

ADAPTED FOR ALL GENERAL SAWING

Diam. Inches	Thickness Gauge	No. of Teeth	Size of Hole Inch	Price Each	Extra for Each Gauge Heavier	Beveling New Saws (Grinding or Beveling Old Saws Extra) Per Gauge	No. of Extra Points sent with Each Saw	Extra Hold- ers given with Each Saw
12	11	10	1	\$ 19.50	\$0.20	\$0.35	50	2
14	11	10	1½	23.00	.25	.40	50	2
16	10	12	1½	27.00	.30	.50	50	2
18	10	14	1½	30.00	.40	.60	50	2
20	9	14	1½	34.00	.50	.70	50	2
22	9	16	1½	38.50	.60	.80	100	2
24	9	18	1½	42.00	.70	.90	100	2
26	9	18	1½	46.00	.85	1.05	100	2
28	9	20	1½	50.00	1.00	1.20	100	2
30	9	20	1½	54.00	1.15	1.30	100	2
32	8	22	1½	61.00	1.30	1.40	150	2
34	8	22	1½	66.00	1.50	1.55	150	2
36	8	24	1½	72.00	1.80	1.70	150	2
38	8	24	1½	78.00	2.00	1.85	150	2
40	8	26	2	84.00	2.30	2.00	150	2
42	8	28	2	94.00	2.60	2.20	200	3
44	7	30	2	102.00	3.00	2.40	200	3
46	7	30	2	110.00	3.50	2.60	200	3
48	7	32	2	120.00	4.00	2.80	200	3
50	7	34	2	134.00	4.50	3.00	200	3
52	6	36	2	156.00	5.00	3.25	300	3
54	6	38	2	174.00	6.00	3.50	300	3
56	6	40	2	194.00	7.00	3.75	300	3
58	6	42	2	212.00	8.00	4.05	300	3
60	5	42	2	230.00	9.00	4.35	300	3
62	5	44	2	260.00	10.00	4.65	300	3
64	5	44	2	290.00	12.00	5.00	300	3
66	5	48	2	320.00	15.00	5.35	300	3
68	5	48	2	350.00	18.00	5.75	300	3
70	4	52	2	380.00	21.00	6.15	300	3
72	4	52	2	420.00	24.00	6.55	300	3

A wrench is included with each saw.

Always give number of saw when ordering duplicate teeth and holders.

**CIRCULAR SAWS
CHISEL TOOTH, NO. 6**



FIG. 5113

Numerous calls have been made on us for Chisel Tooth Saws with a greater number of teeth than Nos. 33 or 44 permit, which would be adapted to heavy feed mills. The following are prices on No. 6 Tooth, showing extra Points, extra Holders and Wrench sent with each saw. These prices also apply to saws carrying the No. 4 $\frac{1}{2}$ Pattern Tooth.

Diam. Inches	Thickness Gauge	No. of Teeth	Size of Hole Inch	Price Each	Extra for Each Gauge Heavier	Beveling New Saws (Grinding or Beveling Old Saws Extra) Per Gauge	No. of Extra Points sent with Each Saw	Extra Hold- ers given with Each Saw
10	12	8	1	\$ 15.50	\$0.12	\$0.28	50	2
12	11	12	1	19.50	.20	.35	50	2
14	10	14	1 $\frac{1}{8}$	23.00	.25	.40	50	2
16	10	16	1 $\frac{1}{8}$	27.00	.30	.50	50	2
18	10	18	1 $\frac{1}{4}$	31.00	.40	.60	50	2
20	9	20	1 $\frac{1}{16}$	36.00	.50	.70	50	3
22	9	22	1 $\frac{1}{16}$	42.00	.60	.80	100	2
24	9	24	1 $\frac{3}{8}$	46.00	.70	.90	100	2
26	9	26	1 $\frac{3}{8}$	52.00	.85	1.05	100	2
28	9	28	1 $\frac{1}{2}$	56.00	1.00	1.20	100	2
30	9	30	1 $\frac{1}{2}$	60.00	1.15	1.30	100	2
32	8	32	1 $\frac{5}{8}$	68.00	1.30	1.40	150	2
34	8	36	1 $\frac{5}{8}$	75.00	1.50	1.55	150	2
36	8	38	1 $\frac{5}{8}$	85.00	1.80	1.70	150	2
38	8	40	1 $\frac{5}{8}$	95.00	2.00	1.85	150	2
40	7	42	2	105.00	2.30	2.00	150	2
42	7	44	2	115.00	2.60	2.20	200	3
44	7	46	2	125.00	3.00	2.40	200	3
46	7	48	2	135.00	3.50	2.60	200	3
48	7	50	2	148.00	4.00	2.80	200	3
50	6	52	2	162.00	4.50	3.00	200	3
52	6	56	2	178.00	5.00	3.25	300	3
54	6	58	2	198.00	6.00	3.50	300	3
56	6	60	2	210.00	7.00	3.75	300	3
58	5	62	2	230.00	8.00	4.05	300	3
60	5	64	2	258.00	9.00	4.35	300	3
62	5	66	2	280.00	10.00	4.65	300	3
64	5	68	2	310.00	12.00	5.00	300	3
66	5	72	2	340.00	15.00	5.35	300	3
68	5	76	2	380.00	18.00	5.75	300	3
70	5	78	2	420.00	21.00	6.15	300	3
72	5	80	2	460.00	24.00	6.55	300	3

Always give number of saw when ordering duplicate teeth and holders.

SAW TEETH

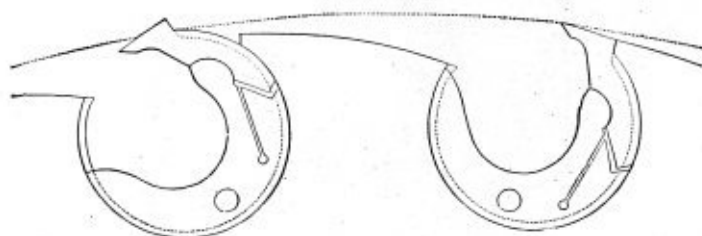


FIG. 5114

WE CAN FURNISH SAW BITS OF ALL MAKES AND SIZES.

INSERTED TOOTH SAW WRENCHES

For All Makes of Saws.

SAW BIT SHANKS OF ALL MAKES.

CIRCULAR SAW MANDRELS



FIG. 5115



FIG. 5116

Size	Diameter Pulley	Face Pulley	Length Shaft	Diameter Shaft	Size Hole in Saw	Price Pulley on End	Price Pulley in Center
0	2	3	16	$\frac{7}{8}$	$\frac{3}{4}$	\$ 3.20	\$ 3.70
1	$2\frac{1}{2}$	$3\frac{1}{2}$	$16\frac{1}{2}$	$1\frac{1}{8}$	1	4.00	4.50
2	3	4	19	$1\frac{1}{8}$	$1\frac{1}{8}$	4.50	5.00
3	$3\frac{1}{2}$	$4\frac{1}{2}$	$21\frac{1}{2}$	$1\frac{1}{8}$	$1\frac{1}{4}$	6.50	7.00
4	4	5	24	$1\frac{3}{8}$	$1\frac{3}{8}$	7.60	8.10
5	$4\frac{1}{2}$	$5\frac{1}{2}$	26	$1\frac{3}{8}$	$1\frac{3}{8}$	9.00	9.50
6	5	6	28	$1\frac{3}{8}$	$1\frac{3}{8}$	9.50	10.00
7	$5\frac{1}{2}$	$6\frac{1}{2}$	$30\frac{1}{2}$	$1\frac{3}{8}$	$1\frac{3}{8}$	10.00	10.50
8	6	7	$32\frac{1}{2}$	$1\frac{3}{8}$	$1\frac{1}{2}$	12.00	12.50
9	7	8	37	$1\frac{1}{2}$	$1\frac{1}{2}$	14.00	14.50
10	8	8	41	$1\frac{1}{2}$	$1\frac{1}{2}$	16.00	16.50
11	9	10	48	$2\frac{1}{2}$	2	24.00	24.50

WIDE BAND SAWS

FOR LOG MILLS AND RESAWING MACHINES



FIG. 5117

Saws of odd widths, not listed, take price of next wider size listed.

For saws of heavier gauge than listed add 5 per cent to list for each gauge heavier.

No extra charge for saws one or two gauges thinner than list; when more than two gauges thinner add 5 per cent to list for each gauge.

Double edge Band-Saws. List price per foot, all widths, advance 10 per cent over list prices of single edge saws as above.

Toothed blanks. Same price as finished saws.

Band-Saw Blanks. Bright, of any width, furnished to order but not warranted.

Width, In.	Usual Gauge	Per Foot	Width, In.	Usual Gauge	Per Foot
2	18 to 20	\$0.80	9	14 to 16	\$3.60
2½	18 to 20	1.00	10	14 to 16	4.00
3	18 to 20	1.20	11	14 to 16	4.50
3½	18 to 20	1.40	12	13 to 15	5.00
4	17 to 19	1.60	13	13 to 15	6.00
4½	17 to 19	1.80	14	13 to 15	7.00
5	17 to 19	2.00	15	12 to 14	8.50
5½	17 to 19	2.20	16	12 to 14	10.00
6	17 to 19	2.40	17	12 to 14	14.00
7	16 to 18	2.80	18	12 to 14	18.00
8	14 to 16	3.20			

NARROW BAND-SAWS

FOR RESAWING AND SCROLL SAWING



FIG. 5118

BAND SAWS SET AND FILED, NOT JOINED

In effect June 1, 1916

Inches Wide	Gauge	Per Foot	Net Prices for Joining Each	Inches Wide	Gauge	Per Foot	Net Prices for Joining Each
¼	21 or 22	\$0.16	\$0.20	1	20 or 21	\$0.27	\$0.30
⅜	21 or 22	.17	.20	1½	20	.29	.30
½	21 or 22	.18	.20	1¾	19 or 20	.31	.30
⅝	21 or 22	.20	.25	1⅞	19 or 20	.35	.35
¾	20 or 21	.22	.25	1½	19 or 20	.38	.35
⅞	20 or 21	.25	.25	1¾	19	.41	.35

Give full particulars when ordering whether saws are wanted brazed, set and filed.

Filing and setting 4 cents per foot extra.

Narrow Band-Saws with beveled backs, advance list 50 per cent for first gauge and 10 per cent for each additional gauge.

For Band-Saws with knife edge, add 10 cents per foot to list. We make a specialty of Band-Saws in coils, any length desired.

BRAZING

¼ to ½ inch.....	\$0.20	1 to 1¼ inch.....	\$0.30
⅝ to ¾ inch.....	.25	1½ to 1¾ inch.....	.35

SIMONDS CRESCENT GROUND CROSS-CUT SAWS

The Simonds saw, crescent ground, will cut ten per cent more timber, same time and labor being used, than any other brand of saw made in the United States.

No. 13



FIG. 5119

No. 22



FIG. 5120

No. 77



FIG. 5121

CRESCENT-GROUND FELLING SAWS

No. 325



FIG. 5122

List Prices on Above

Length	feet	5	5½	6	6½	7	7½	8
List price	each	\$4.30	5.10	5.90	6.80	7.80	8.90	10.00

SIMONDS ONE MAN CROSS-CUT SAWS

No. 111. Straight Ground



FIG. 5123

Length	feet	3	3½	4	4½	5
List price	each	\$1.92	2.24	2.56	2.88	3.20

BAY STATE CROSS-CUT SAWS

No. 205



FIG. 5125

No. 205. Length.....	feet	5	5½	6	6½	7
List price	each	\$2.60	2.86	3.12	3.88	3.64

No. 210



FIG. 5126

No. 210. Length.....	feet	5	5½	6	6½	7
List price	each	\$1.40	1.54	1.68	1.82	1.96

SIMONDS IMPROVED CRESCENT SAW TOOL

No. 342



FIG. 5127

This tool insures quick, accurate and rigid adjustment of the raker gage, as well as easy adjustment of the jointing file. There is no chance to dislocate slide when once set in position. Hardened steel plates and screws are furnished on all wearing surfaces, and all parts of the tool are interchangeable.

Price, without Hammer	per set	\$1.20
Drop forged, cast steel Hammers.....	each	.50

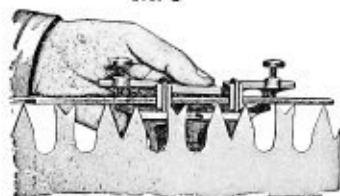
SIMONDS CRESCENT SAW TOOLS

No. 340

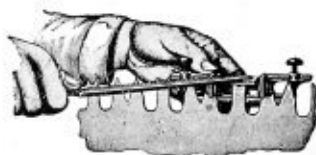


FIG. 5130

No. 2



No. 3



No. 4



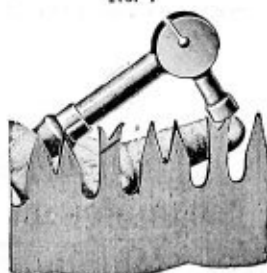
No. 5



No. 6



No. 7



Illustrations Nos. 2 to 7 show methods of using tool.

No. 2—Joining the Saw.

No. 3—Filing Raker or Cleaner Teeth.

No. 4—Setting the Teeth.

No. 5—Regulating the Set.

No. 6—Spring Set.

No. 7—Swaging Raker Teeth.

Price, per dozen sets, without Hammer.....\$10.50
 Drop-forged Tool Steel Hammers, per dozen..... 4.80

CROSS-CUT SAW HANDLES

Atkins No. 3



FIG. 5137

Atkins No. 4

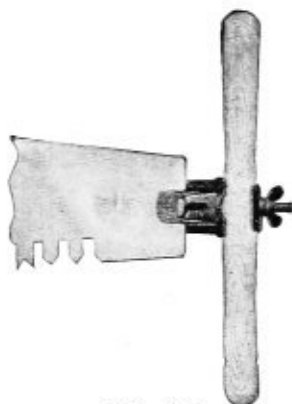


FIG. 5138

Atkins No. 8



FIG. 5139

ATKINS NO. 3 HANDLE

Ten inches long irrespective of loops. Malleable casting and swivel washer cast to socket. Spot electric welded loop of high tensile strength, cold drawn steel. Capacity three to four and one-half inches. Japanned black.

Priceper pair \$0.50

ATKINS NO. 4 HANDLE

Fourteen inches long. Reversible. Saw may be attached to either the end or middle of handle. All castings malleable. Carefully selected hardwood stock. Dexter Pattern.

Priceper pair \$0.60

ATKINS NO. 8 HANDLE

Ten inches long irrespective of loops. Loop of extra strong high tensile strength steel. Spot electric weld. Japanned black. Malleable nuts.

Priceper pair \$0.45

ATKINS NO. 8 SHORT PATTERN HANDLE

Same as regular No. 8, only 7½ inches long.

Priceper pair \$0.45

NO. 51 "PROUTY" HANDLE



FIG. 5140

No. 51 Prouty—Self-adjustable, case hardened bottom. cross-cut saw handle with Norway iron loops. These handles are favorites with lumbermen.

Priceper pair \$0.40

"BESTOVALL" **HAND, PANEL AND RIP SAWS**

RIP



FIG. 5142

The tempering of this saw is so uniform and perfect that the blade may be bent into a circle, yet will spring back perfectly straight.

Highest grade crucible steel; extra polished and fancy etched blade; carved and varnished apple wood handle, fastened with nickel-plated screws; taper ground thin back blade; teeth bevel filed by hand and accurately set.

"BESTOVALL" RIP—GRADUATED TEETH, SKEW BACK WITH 4 SCREWS

Length cutting edge.....inches	26	28
Width of blade at point....."	$2\frac{1}{4}$	$2\frac{5}{8}$
Greatest width of blade....."	$7\frac{3}{4}$	$7\frac{3}{4}$
Points to the inch.....	$4\frac{1}{2}$, 5, $5\frac{1}{2}$, 6	$4\frac{1}{2}$, 5, $5\frac{1}{2}$, 6
List.....per dozen	\$21.00	24.00

"BESTOVALL" HAND



FIG. 5143

HAND—SKEW BACK WITH FOUR SCREWS

Length of cutting edge.....inches	26	28
Width of blade at point....."	$2\frac{1}{2}$	$2\frac{5}{8}$
Greatest width of blade....."	$7\frac{3}{4}$	$7\frac{3}{4}$
Points to the inch.....	6, 7, 8, 9, 10, 11, 12	5, 6, 7
List.....per dozen	\$21.00	24.00

"BESTOVALL" PANEL



FIG. 5144

SKEW BACK WITH 3 SCREWS

Length of cutting edge, in.	18	20	22	24
Width of blade at point, "	$2\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{1}{2}$
Points to the inch.....	8, 9, 10, 11, 12	8, 9, 10, 11, 12	8, 9, 10, 11, 12	8, 9, 10, 11, 12
List.....per dozen	\$15.00	16.50	18.50	20.00

"FORT PITT" **HAND, PANEL AND RIP SAWS**

RIP



FIG. 5145

Ground, thin back blade; bevel-filed and accurately set teeth.
Special crucible steel, polished and etched blade; carved and varnished spring cherry handle, fastened with special nickel plated screws.

"FORT PITT" RIP--GRADUATED TEETH, STRAIGHT BACK WITH 4 SCREWS

Length of cutting edge.....inches	26	28
Greatest width of blade.....inches	$7\frac{3}{8}$	$7\frac{3}{4}$
Width of blade at point....."	$2\frac{3}{4}$	$2\frac{3}{8}$
Points to the inch....."	$4\frac{1}{2}$, 5, $5\frac{1}{2}$	$6\frac{1}{2}$, 5, $5\frac{1}{2}$, 6
List.....per dozen	\$21.00	24.00

HAND

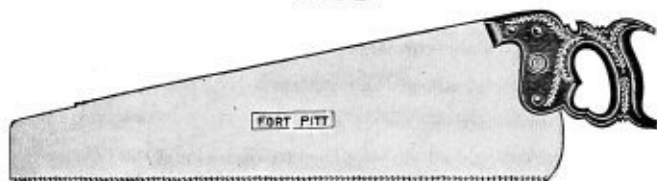


FIG. 5146

"FORT PITT" HAND--STRAIGHT BACK WITH 4 SCREWS

Length of cutting edge.....inches	26	28
Greatest width of blade.....inches	$7\frac{3}{8}$	$7\frac{3}{4}$
Width of blade at point....."	$2\frac{3}{4}$	$2\frac{3}{8}$
Points to the inch....."	6, 7, 8, 9, 10, 11, 12	5, 6, 7
List.....per dozen	\$21.00	24.00

PANEL



FIG. 5147

"FORT PITT" PANEL--STRAIGHT BACK WITH 4 SCREWS

Length of cutting edge, in.	18	20	22	24
Greatest width of blade, "	$5\frac{1}{4}$	$5\frac{1}{8}$	$6\frac{1}{4}$	$6\frac{3}{4}$
Width of blade at point, "	$2\frac{1}{4}$	$2\frac{1}{8}$	$2\frac{3}{4}$	$2\frac{1}{2}$
Points to the inch....."	8, 9, 10, 11, 12	8, 9, 10, 11, 12	8, 9, 10, 11, 12	8, 9, 10, 11, 12
List.....per dozen	\$15.00	16.50	18.50	20.00

**"MONARCH"
HAND, PANEL AND RIP SAWS**
RIP

Medium grade, but will give good service

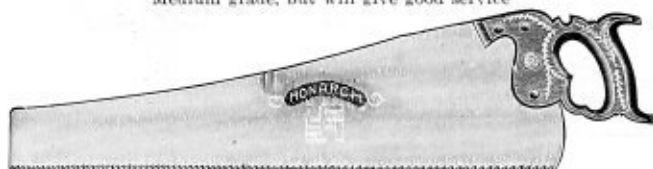


FIG. 5148

Special spring steel, polished and etched blade; plain beechwood handle, with varnished edges; brass screws; thin back blade; teeth set and filed.

"MONARCH" RIP, SKEW BACK, WITH FOUR SCREWS

Length of cutting edge.....inches	28
Greatest width of blade.....inches	7 $\frac{3}{4}$
Width of blade at point....."	2 $\frac{3}{4}$
Points to the inch.....	4 $\frac{1}{2}$, 5, 5 $\frac{1}{2}$, 6
Weight per dozen about.....pounds	27
List per dozen.....	\$15.00

HAND



FIG. 5149

"MONARCH" HAND, SKEW BACK, WITH FOUR SCREWS

Length of cutting edge.....inches	26
Greatest width of blade.....inches	6 $\frac{3}{4}$
Width of blade at point....."	2 $\frac{1}{4}$
Points to the inch.....	6, 7, 8, 9
Weight per dozen about.....pounds	25
List per dozen.....	\$13.00

PANEL



FIG. 5150

"MONARCH" PANEL, SKEW BACK, WITH THREE SCREWS

Length of cutting edge.....inches	18	20	22
Greatest width of blade.....inches	6	6 $\frac{1}{8}$	6
Width of blade at point....."	2	2	2 $\frac{1}{4}$
Points to the inch.....	8, 9, 10, 11	8, 9, 10, 11	8, 9, 10, 11
Weight per dozen about.....pounds	15	16	18
List per dozen.....	\$7.00	9.00	11.00

HAND, RIP AND PANEL SAWS

DISSTON'S



FIG. 5151

Skew back; spring steel, patent ground and tempered; carved apple handle; five improved screws.

No.	Description	List, per dozen
D100	Disston's Hand, 26 inch; points 7, 8, 9, 10, 11 and 12.....	\$25.00
D100	" Rip, 28 " " 4½, 5, 5½ and 6.....	28.00
D100	" Panel, points 8, 9, 10, 11 and 12 {	18 inch.....
		20 ".....
		22 ".....

DISSTON'S



FIG. 5152

Straight back; extra refined London spring steel, polished blade, patent ground and tempered; highly polished and carved handle; four improved brass screws.

No.	Description	List, per dozen
12	Disston's Hand, 26 inch, points 7, 8, 9, 10, 11 and 12.....	\$29.00
12	" Rip, 28 " " 4½, 5, 5½ and 6.....	33.00
12	" Panel, points 8, 9, 10, 11 and 12 {	18 inch.....
		20 ".....
		22 ".....

DISSTON'S ACME



FIG. 5153

Skew back; extra London spring steel, grained and polished blade; carved and polished handle; five rivets; warranted.

No. 120. Acme, Disston's Hand; 26 inch, assorted points, 8, 9, 10, 11 and 12;

List.....per dozen, \$32.00

One-third dozen in a box.

HAND, RIP AND PANEL SAWS

DISSTON'S



FIG. 5154

Cast steel. Grained Blade. Etched. Beech handle. Four improved screws.

No.	Description	List Price, Per Dozen
7	Disston's Hand, 26 inch; points 6, 7, 8, 9, 10 and 11.....	\$20.00
7	" Rip, 28 " " 4 1/2, 5, 5 1/2 and 6.....	23.50
7	" Panel, 18 " " 8, 9, 10, 11 and 12.....	14.00
7	" " 20 " " 8, 9, 10, 11 " 12.....	16.00
7	" " 22 " " 8, 9, 10, 11 " 12.....	18.00

DISSTON'S



FIG. 5155

Spring steel. Warranted. Skew back. Etched Blade. Apple handle. Polished edge. Five improved screws. Rip saws with graduated teeth.

No.	Description	List Price, Per Dozen
D8	Disston's Hand, 26 inch; points 6, 7, 8, 9, 10, 11 and 12.....	\$22.50
D8	" Rip, 28 " " 4, 4 1/2, 5, 5 1/2 and 6.....	25.50
D8	" Panel, 18 " " 8, 9, 10, 11 " 12.....	16.25
D8	" " 20 " " 8, 9, 10, 11 " 12.....	18.00
D8	" " 22 " " 8, 9, 10, 11 " 12.....	20.00

One-third dozen in cardboard box.

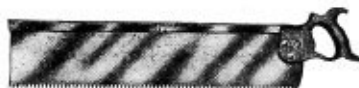


FIG. 5156

ATKINS MITRE BOX SAWS

No. 1. Made of Atkins Silver Steel. The teeth will hold their points and set. Applewood handles and polished edges.

Length	inches	18	20	22	24	26	28	30	32
Price, 4 in. under back....	per doz.	\$25.25	27.50	29.75	32.00	34.25	36.50	38.75	41.00
Price, 5 in. under back....	per doz.	.....	.....	32.00	35.00	38.00	41.00	44.00	47.00
Price, 6 in. under back....	per doz.	.....	.....	35.50	39.00	42.50	46.00	49.50	53.00



FIG. 5157

ATKINS COMPASS SAWS

No. 2. Silver Steel. Saw screw and medallion, carved and polished apple handle.

Length	inches	10	12	14	16	18
Price, Saws complete.....	per doz.	\$5.00	5.25	5.50	5.75	6.00
Price, Blades only.....	per doz.	3.00	3.25	3.50	3.75	4.00

ATKINS KEYHOLE SAWS



FIG. 5158

No. 5. Sheffield Saw Works, beech handle, 10 and 12 inch lengths.....	price, per dozen	\$2.50
No. 6. E. C. Atkins & Co. Saw Screw and Medallion. Apple handle, 10 and 12 inch lengths.....	price, per dozen	\$4.50

ATKINS NEST OF SAWS



FIG. 5159

Set consists of Keyhole, Compass and Pruning Saw, Blade and Handle.

Description	Price, Per Dozen		
	No. 1	No. 2	No. 3
Handles and Screws.....	\$2.00	2.00	3.50
Keyhole Blades, 10 inches long.....	.....	2.00	.....
Keyhole Blades, 12 inches long.....	2.00	.....	2.00
Compass Blades, 12 inches long.....	.....	2.75	.....
Compass Blades, 14 inches long.....	3.00	.....	3.00
Compass Blades, 16 inches long.....	.....	3.25	.....
Pruning Blades, 18 inches long.....	5.50	.....	.....
Special Nail Cutting Blades, 18 inches long.....	.....	.....	11.50
Total for nests.....	\$12.50	10.00	20.00
Weight, per dozen sets.....	pounds 11¾	10	14

Nos. 1 and 2 Nests can be furnished with our patent adjustable handle as follows: No. 1 Nest, \$14.00 per dozen, and No. 2 Nest, \$11.50 per dozen.

MORRILL SAWSETS



FIG. 5160

Length, 6½ in. Weight, 10 oz.

"SPECIAL" for Hand Saws ½ in. or over in width, not over 16 gauge. Polishedper dozen \$24.00

Length, 6¾ in. Weight, 10 oz.

No. 1 for Hand Saws ½ in. or over in width, not over 16 gauge. Polishedper dozen 22.50

No. 1 OLD STYLE for Hand, Band and Jig Saws, any width, not over 16 gauge. Polishedper dozen 18.00



FIG. 5161

Length, 9¾ in. Weight, 1¼ lbs.

No. 3 Pointed Plunger for Cross Cut and Circular Saws, single tooth, 14 to 20 gauge. Cast finished.....per dozen \$36.00

No. 4 Square Plunger for Cross Cut M and Champion Saws, double teeth, 14 to 20 gauge. Cast finished.....per dozen 36.00



FIG. 5162

Length, 15 in. Weight, 3 lbs.

No. 5 for Timber and Board saws from 6 to 14 gauge. Cast finished...per doz. \$54.00

ATKINS UPSET SWAGES

Used on All Kinds of Saws

In ordering, specify type of saw and gage on which Swage is to be used.

No. 2



FIG. 5163

No. 2. Swage for band and cylinder saws.....price, each \$2.25

Nos. 0, 1, 2, and 3



FIG. 5164

- No. 0. Swage for large circular saws, from 5 to 10 gage.....price, each \$3.00
 No. 1. Swage for large circular saws, from 8 to 12 gage.....price, each 2.75
 No. 2. Swage for small circular saws and mill saws of thinner gage.....
price, each 2.25
 No. 3. Swage for small circular saws.....price, each 1.75



FIG. 5165

The above cut shows inside construction of Atkins Swages listed above.

MIXTER'S SWAGES

Nos. 0, 1, 2, and 3



FIG. 5166

- No. 0. Swage for small thin saws.....price, each \$4.00
 No. 1. Swage for all thinner saws.....price, each 5.00
 No. 2. Swage for saws from 8 to 12 gage.....price, each 6.00
 No. 3. Swage for saws from 5 to 10 gage.....price, each 7.00

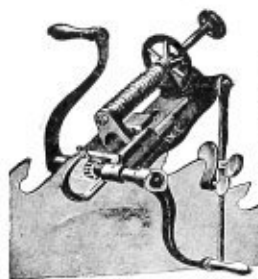


FIG. 5167

"IXL" SAW GUMMER

Has a changeable self-feed, but is not automatic. It is pronounced first-class and a very quick worker by those using it, and we sell it as such. It is designed especially as a low priced Gummer; is strong, and will do its work thoroughly.

WARRANTED

The "IXL" Saw Gummer, complete, with three arbors, two cranks and wrench, with three Solid Cutters, any size on list, and one cutter grinder.

List.....each, \$15.00

"STANDARD" SAW GUMMER

Has an automatic changeable self-feed, is very simple in construction, and beyond question a very complete and superior machine.

WARRANTED

The "Standard" Saw Gummer, complete, with three arbors, two cranks and wrench, with four Solid Cutters, any size on list, and one Cutter Grinder. List.....each, \$20.00



FIG. 5168



FIG. 5169

SOLID CUTTERS

Of the highest standard of quality, and warranted. Of sizes to suit all the different Gummers in use, including above machines. In ordering, please give the name of Gummer that Cutters are for, or give the length, diameter and size of hole, or send an impression on paper.

Size, Diameter, in.	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	1 $\frac{1}{8}$	1 $\frac{1}{4}$	1 $\frac{3}{8}$	1 $\frac{1}{2}$
List.....each	\$9.50	50	50	60	70	80	90	1.00	1.25	1.25

LESLIE PATENT SAW SWAGE AND SHARPENER

**SHARPENS AND FINISHES THE TEETH PERFECTLY
TRUE AND ALL ALIKE**

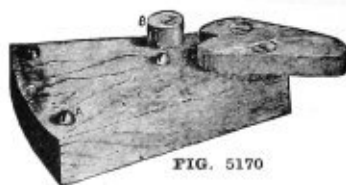


FIG. 5170

This Swage has been used by many of the best sawyers in the country for a number of years, and gives perfect satisfaction. The bit has a three-fold convex surface, which spreads the tooth from the center, leaving the corner strong and full. The set screws (A) are to adapt the Swage to a saw of any thickness. The tooth should be worked in the center of the Swage, unless it is necessary to draw one corner longer than the other to change the lead of the saw.

The edge of the teeth will need no filing, except occasionally a slight touch with a half-worn file. The eccentric (B) is to adapt the Swage to the pitch of the tooth. The Swage is tempered by a process which renders the surface of the jaws as hard as diamond, while the body remains tough. The jaws will not batter on the hardest saws.

List.....\$5.00

ATKINS IDEAL SAW SWAGES

For all types of saws, including band re-saws, circular saws of all sizes and shapes of teeth, shingle saws, cylinder saws, etc.

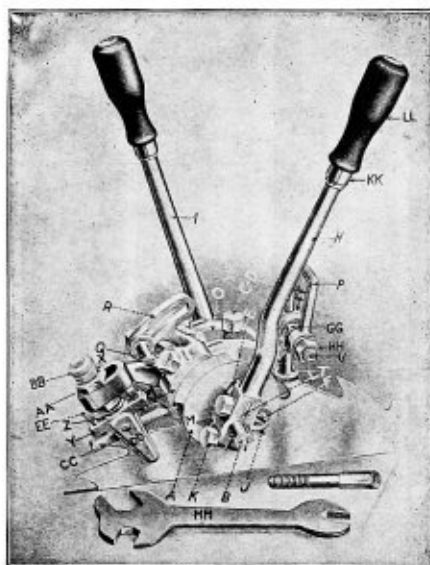


FIG. 5171

Ideal Swage No.	Size Die Inches	Depth of Tooth Not Less Than Inches	Gage and Thickness of Saws	Made For	List Prices Each
0	$\frac{1}{16}$	Shallow	19 gage and thinner	Band saws	\$37.50
00	$\frac{3}{16}$		16, 17, 18, 19	*Band saws	37.50
1	$\frac{1}{8}$		13, 14, 15, 16	Band and gang saws	37.50
9	$\frac{1}{16}$		12, 13, 14, 15	Band saws	45.00
2	$\frac{5}{16}$		8, 9, 10, 11, 12	Circular saws	45.00
5	$\frac{5}{16}$		12, 13, 14	Band and gang saws	45.00
3	$\frac{3}{4}$		6, 7, 8, 9, 10	Circular saws	52.50
6	$\frac{3}{4}$		11, 12, 13, 14	†Band saws	52.50
4	$\frac{1}{2}$		14, 15, 16, 17, 18, 19	‡Shingle saws	37.50
7	$\frac{1}{2}$	$\frac{7}{16}$	11, 12, 13, 14	Circular saws	37.50
8	$\frac{1}{2}$	$\frac{7}{16}$	11, 12, 13, 14, 15, 16	Cylinder saws	37.50

*Also applies to shingle saws for which a special front fork is provided.

†Heavy duty swaging.

‡Edgers and lath saws.

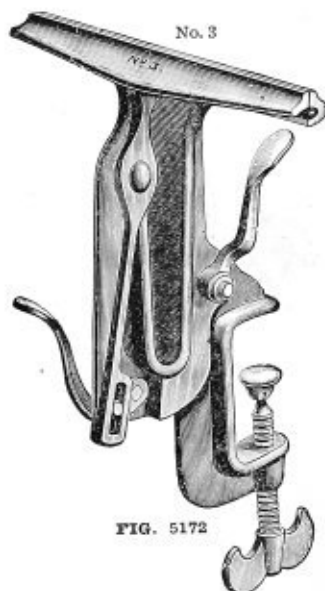


FIG. 5172

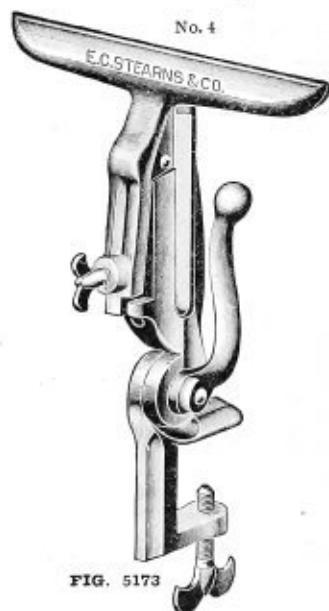


FIG. 5173

Stearns SAW VISES

NO. 3

No. 3. 9 1/2-inch jaws. May be readily removed from bench or adjusted to light while filing.

List price.....per dozen, \$16.00

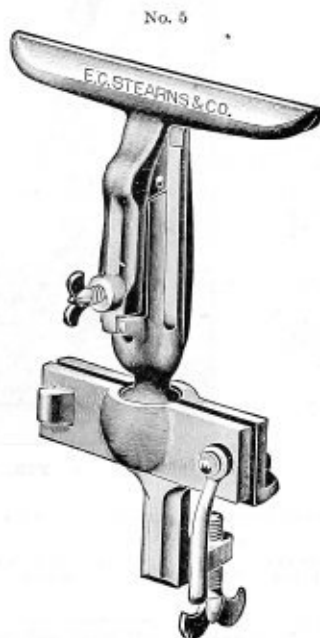


FIG. 5174

NO. 4. 9 1-2-INCH JAWS

May be readily detached from bench. Heavy pattern.

List price.....per dozen, \$18.00

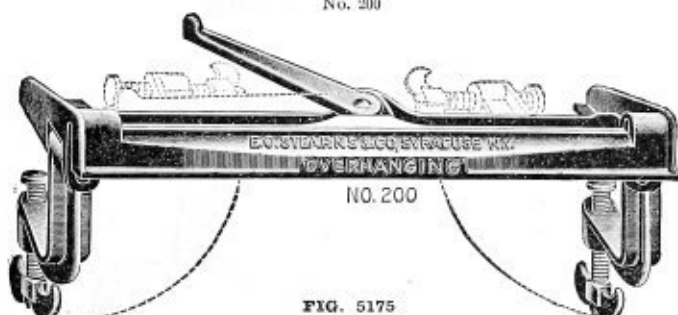
NO. 5. 9 1-2-INCH JAWS

Ball and socket adjustment; holds the saw at any angle for convenience in filing. May be readily detached from bench. Heavy pattern.

List price.....per dozen, \$25.00

"OVERHANGING" FOLDING SAW VISE

No. 200

**FIG. 5175**

This is the most complete Folding Saw Vise on the market, and the only one having a noiseless rubber jaw.

It may be fastened to the bench or any other suitable place, either by means of the clamps or by screws. It takes no more room in the tool chest than a carpenter's plane.

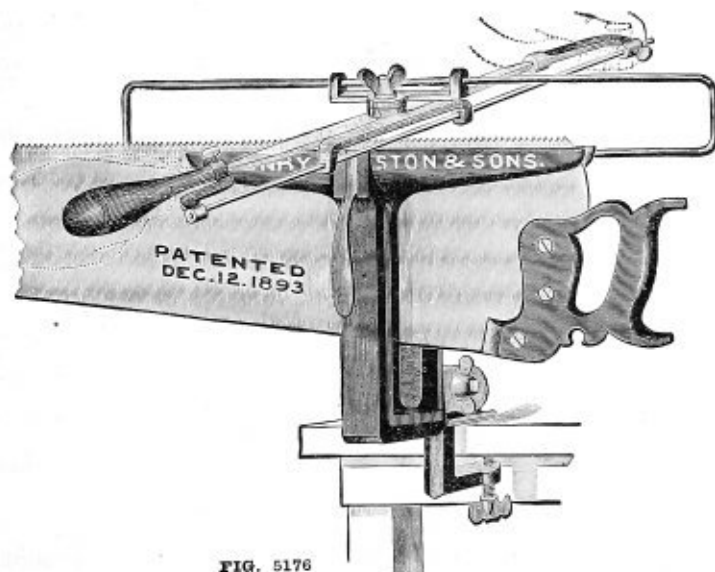
The front jaw is faced with a rubber strip, which prevents all noise and vibration.

List price, japanned.....per dozen, \$18.00

Packed one-twelfth dozen in pasteboard box. Four dozen in a case.

SAW FILING GUIDE

ESPECIALLY DESIGNED TO ASSIST THOSE NOT SKILLED IN THE ART OF SAW-FILING TO FILE A SAW CORRECTLY

**FIG. 5176**

This Guide attached to our No. 3 clamp. Length of jaw, 12½ inches. Price includes clamp, Filing Guide, file and handle.

D3 Guide and clamp, complete.....per dozen, \$30.00

Packed one in a box.

ZIMMERMAN PATENT WHEEL-GUARD AND TRACK CLEANERS

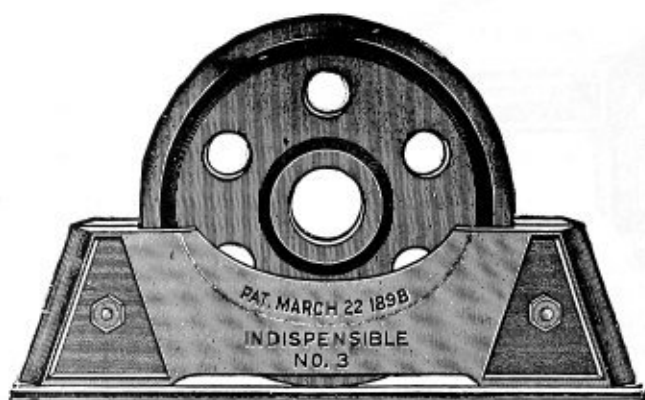


FIG. 5177

FOR 14 AND 16-INCH DIAMETER WHEELS

Price, for 2 Block Carriage (4 Shoes).....	per set	\$40.00
" " 3 " " (up to and including 6 Shoes).....	" "	50.00
" " 4 " " (up to and including 8 Shoes).....	" "	65.00
" " 5 " " (up to and including 10 Shoes).....	" "	75.00

The above prices apply only to 14 and 16-inch diameter sizes.

All wheels on sawside of carriage being equipped, as we never furnish these guards except in full sets, or one for each wheel on sawside of carriage.

For 18 and 20-inch sizes, add 20 per cent to above prices. For 10 and 12-inch sizes, deduct 15 per cent from above prices.

The Zimmerman Patent Wheel-Guard and Track Cleaner is the only device ever invented that insures a clean track, smooth running carriage, hence better running saws and even lumber. No possible interference with offset of band-mill carriage. No trouble to put on. No repairs to follow.

Made for both flat and V track.

The spoked or armed wheels require the same opening in the guard as the web center with ribs or brackets on sides. The plain web, as shown in above cut, requires less opening, and will not admit the spoked or ribbed web; hence the importance of knowing which kind you have.

The Zimmerman Patent Wheel-Guard and Track Cleaners are now in use by thousands of the best sawmills in the South and the Pacific Coast.

Special instructions to observe in ordering, so there can be no possible chance for misfit:

- 1st. Give diameter of wheel and width of face of track.
- 2nd. Give style of wheels; whether they are plain, web center or spoke.
- 3rd. If web center, state whether webs have brackets or ribs to strengthen them.
- 4th. State if flat or V track.
- 5th. If for V track, give diameter of wheel over all.

COLEMAN IMPROVED SLAB CONVEYOR CLEAT
FOR HANDLING SLABS, SAWDUST, OR SHAVINGS

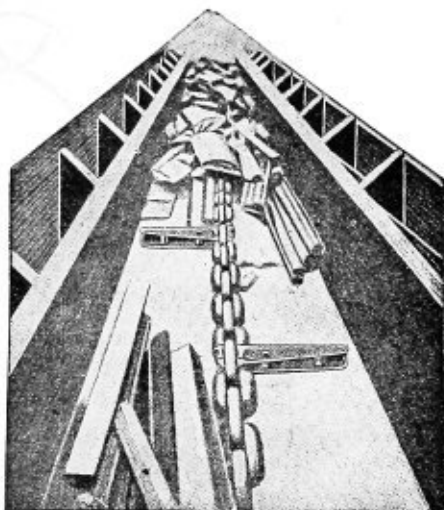


FIG. 5178

The Improved "Coleman" Conveyor Cleats are manufactured out of a high grade of malleable iron, and will last for years. Any sawmill using wooden cleats will spend as much on them in ninety days as a full set of Improved "Coleman" Conveyor Cleats will cost them.

They should be attached to the chain every three feet; we make them to fit any size of chain and any width of trough.

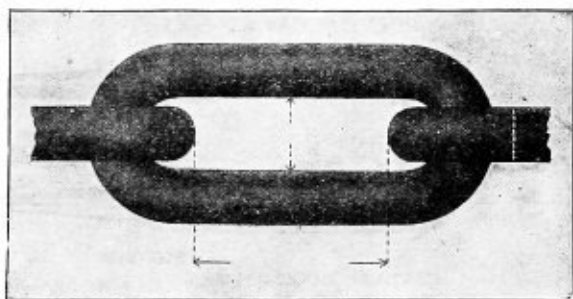


FIG. 5179

Special instructions to observe in ordering, so there may be no misfit:

- 1st. Give diameter of chain link.....See sketch
- 2nd. Give inside width of chain.....See sketch
- 3rd. Give length in clear.....See sketch
- 4th. Give width of conveyor trough.

Prices upon application.

LOG CALIPERS, GAGES, ETC.

LOG CALIPERS

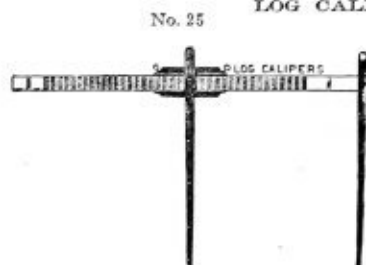


FIG. 5180



FIG. 5181

Price No. 25 Brass tipped clear cedar frame, maple jaws, burnt figures...each \$12.00
 Price No. 26 Nickel plated, for 36-inch logs.....each 22.50

No. 25 gives contents of log in board feet; No. 26 gives diameters only.
 No. 27 same as 26, but for larger logs, to order.

LUMBER GAGES



FIG. 5182

For measuring thickness of lumber. Made of nicely finished aluminum, very light and convenient.

No. 0 1, 1 1/4, 1 1/2, 1 3/4, 2 inches.....per dozen \$6.00
 No. 00 3/4, 1, 1 1/4, 1 1/2, 1 3/4, 2 inches....." " 6.00
 No. 000 3/4, 1, 1 1/4, 2, 2 1/2 inches....." " 6.50

Beaded Boot Calks



FIG. 5183

Calk Set



FIG. 5184

Calk Set and Punch Combined

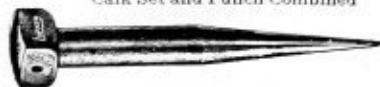


FIG. 5185

BEADED BOOT CALKS

Description.....	Extra Small	Small Ball	Small Ball	Medium Ball	Large Ball	Small Heel	Large Heel
Number	000	00	0	1	2	3	4
Price .....1000	\$.....	6.00	6.00	7.00	8.00	10.00	10.00

CALK SETS

Priceper dozen \$3.00

CALK SET AND PUNCH COMBINED

Priceper dozen \$5.00

MALLEABLE SOCKET PEAVIES
DUCK-BILL HOOKS, HICKORY HANDLES



FIG. 5186

SPLIT SOCKET PEAVIES

No. 36. $2\frac{1}{8}$ x5 ft. Hickory Handles.....per dozen, \$26.90

SOLID SOCKET PEAVIES

No. 51. $2\frac{1}{8}$ x5 ft. Hickory Handles.....per dozen, 26.90

CHAMPION STEEL SOCKET PEAVIES

WITH DUCK-BILL HOOKS, HICKORY OR MAPLE HANDLES

No. 66.	$2\frac{1}{8}$ x5 ft. Maple Handles.....	per dozen, \$28.10
No. 69.	$2\frac{3}{4}$ x5 " " " " " " " " " " " "	" " 31.70
No. 81.	$2\frac{1}{8}$ x5 ft. Hickory " " " " " " " " " " " "	" " 29.50
No. 84.	$2\frac{3}{4}$ x5 " " " " " " " " " " " "	" " 33.40

CHAMPION MALLEABLE CLASP CANT HOOKS
DUCK-BILL HOOKS, WITH HICKORY OR MAPLE HANDLES



FIG. 5187

No. 223.	$2\frac{1}{8}$ x5 ft. Maple Handles.....	per dozen, \$19.80
No. 226.	$2\frac{3}{4}$ x5 " " " " " " " " " " " "	" " 22.90
No. 234.	$2\frac{1}{8}$ x5 ft. Hickory " " " " " " " " " " " "	" " 22.50
No. 237.	$2\frac{3}{4}$ x5 " " " " " " " " " " " "	" " 25.80

PROUTY CANT HOOKS AND PEAVIES



FIG. 5188

NO. 46 PEAVEY

Size	inches	2 $\frac{1}{8}$	2 $\frac{1}{4}$	2 $\frac{3}{8}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	3
Ironwood Handles.....	per dozen	\$27.50	27.50	27.50	27.50	30.00	30.00
Hickory Handles	per dozen	27.00	27.00	27.00	27.00	29.50	29.50
Maple Handles	per dozen	26.25	26.25	26.25	26.25	28.75	28.75

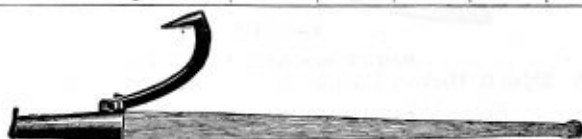


FIG. 5189

NO. 44 SOCKET CANT HOOK

Size	inches	2 $\frac{1}{8}$	2 $\frac{1}{4}$	2 $\frac{3}{8}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	3
Ironwood Handles.....	per dozen	\$23.50	23.50	23.50	23.50	25.50	25.50
Hickory Handles	per dozen	23.00	23.00	23.00	23.00	25.00	25.00
Maple Handles	per dozen	22.25	22.25	22.25	22.25	24.25	24.25

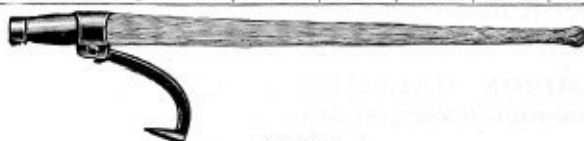


FIG. 5190

NO. 45 CLIP CANT HOOKS

Size	inches	2 $\frac{1}{8}$	2 $\frac{1}{4}$	2 $\frac{3}{8}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	3
Ironwood Handles	per dozen	\$19.00	19.00	19.00	20.00	20.00	20.00
Hickory Handles	per dozen	18.50	18.50	18.50	19.50	19.50	19.50
Maple Handles	per dozen	17.75	17.75	17.75	18.75	18.75	18.75



FIG. 5191

NO. 43 SOCKET PEAVEY

Size	inches	2 $\frac{1}{8}$	2 $\frac{1}{4}$	2 $\frac{3}{8}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	3
Ironwood Handles.....	per dozen	\$27.50	27.50	27.50	27.50	30.00	30.00
Hickory Handles	per dozen	27.00	27.00	27.00	27.00	29.50	29.50
Maple Handles	per dozen	26.25	26.25	26.25	26.25	28.75	28.75

PROUTY HANDLES



FIG. 5192

No. 38—Cant hook handles chucked to fit our clip cant hooks of $2\frac{1}{4}$ and $2\frac{1}{2}$ inches so that they can be repaired very quickly when broken. Made in ironwood, hickory or first-class butts of white maple, and in any length.

Ironwood. List.....	per dozen,	\$4.75
Hickory. ".....	" "	4.25
Maple. ".....	" "	3.50



FIG. 5193

No. 39—Spud handles made from selected timber and chucked to fit all standard sizes of spuds.

Either style	per dozen,	\$0.75
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FIG. 5194



FIG. 5195

No. 40—Peavie handles chucked and bored in the following sizes: $2\frac{1}{8}$, $2\frac{1}{4}$, $2\frac{3}{8}$, $2\frac{1}{2}$, $2\frac{3}{4}$, and made in lengths to suit the different requirements. These handles are made from ironwood, hickory and first-class white maple butts, finished to fit our irons so that any ordinary woodsman can rehandle our peavies in less than ten minutes.

Ironwood. List.....	per dozen,	\$4.75
Hickory. ".....	" "	4.25
Maple. ".....	" "	3.50



FIG. 5196

No. 41—Peavie handles turned in the old way for the blacksmith trade from the different kinds of wood, and in lengths and sizes to suit the trade.

Ironwood. List.....	per dozen,	\$4.75
Hickory. ".....	" "	4.25
Maple. ".....	" "	3.50

Standard length for all peavies and cant hook handles is $4\frac{1}{2}$ feet. Larger than sizes given and longer than $4\frac{1}{2}$ feet will be charged extra in proportion.

TIMBER CARRIER

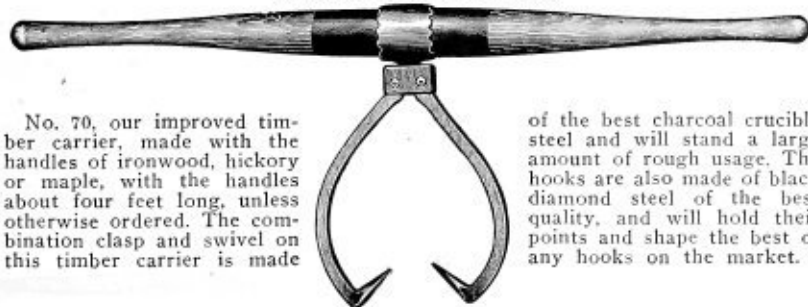


FIG. 5197

No. 70, our improved timber carrier, made with the handles of ironwood, hickory or maple, with the handles about four feet long, unless otherwise ordered. The combination clasp and swivel on this timber carrier is made

of the best charcoal crucible steel and will stand a large amount of rough usage. The hooks are also made of black diamond steel of the best quality, and will hold their points and shape the best of any hooks on the market.

Price put up with ironwood handles, $2\frac{1}{2} \times 4\frac{1}{2}$	per dozen,	\$25.00
Price put up with hickory handles, $2\frac{1}{2} \times 4\frac{1}{2}$	per dozen,	24.50
Price put up with maple handles, $2\frac{1}{2} \times 4\frac{1}{2}$	per dozen,	23.75

CANT HOOK AND PEAVEY HANDLES



FIG. 5198

No. 752.	2 1/2 x 5	feet, hickory handles	per dozen,	\$7.60
No. 753.	2 1/2 x 5 1/2	"	"	8.40
No. 754.	2 1/2 x 6	"	"	9.00
No. 756.	2 3/4 x 5	"	"	8.80
No. 757.	2 3/4 x 5 1/2	"	"	10.00
No. 758.	2 3/4 x 6	"	"	11.20
No. 759.	3 x 5	"	"	10.20
No. 760.	3 x 5 1/2	"	"	11.80

PIKE AND HOOK



FIG. 5199

No. 406.	10 feet	per dozen,	\$18.00
No. 407.	12 "	"	20.30
No. 408.	14 "	"	24.50
No. 409.	16 "	"	31.30
No. 410.	18 "	"	39.90
No. 411.	20 "	"	52.00

STRAIGHT PIKE



FIG. 5200

No. 412.	10 feet	per dozen,	\$15.80
No. 413.	12 "	"	18.10
No. 414.	14 "	"	22.30
No. 415.	16 "	"	29.10
No. 416.	18 "	"	37.70
No. 417.	20 "	"	49.80



FIG. 5201

NO. 595—PIKE POLE PIKES

Curved.....per dozen, \$8.00

NO. 596—PIKE

Per dozen.....\$4.80



FIG. 5202

PIKE POLE FERRULES

No. 597.per dozen sets, \$3.50

MALLEABLE SHORT TOE RINGS



FIG. 5203

No. 579. For $2\frac{1}{2}$, $2\frac{3}{4}$, or 3-inch tools..... per dozen, \$1.20

FORGED STEEL TOE RINGS



FIG. 5204

No. 581. For all size tools..... per dozen, \$2.20

MALLEABLE EXTENSION TOE RINGS



FIG. 5205

No. 580. For all size tools..... per dozen, \$1.90

CANT HOOK AND PEAVEY BOLTS



FIG. 5206

No. 592. $\frac{7}{16}$ x $1\frac{1}{4}$ hexagon head..... per 100, \$5.20

' 385. $\frac{1}{2}$ x $1\frac{3}{4}$ " " " " 5.60

' 386. $\frac{1}{2}$ x 2 " " " " 6.00



FIG. 5207

MALLEABLE CANT HOOK CLASPS

No. 573. $2\frac{1}{2}$ -inch..... per dozen, \$3.70

" 574. $2\frac{3}{4}$ " " " 4.40

" 575. 3 " " " 5.30

HAND FORGED
STEEL CANT HOOK CLASPS

No. 576. $2\frac{1}{2}$ -inch..... per dozen, \$6.00

" 577. $2\frac{3}{4}$ " " " 6.50

" 578. 3 " " " 7.00



FIG. 5208

BARK SPUD



FIG. 5209

- No. 638. Complete with hard maple handles, 12 to 15 inches....per dozen \$14.70
 No. 639. Without handlesper dozen 13.60

AXE HANDLE HOOKAROONS



FIG. 5210

- No. 421. Light single pick, solid eye.....per dozen \$10.40
 No. 422. Heavy single pick, solid eye.....per dozen 13.20

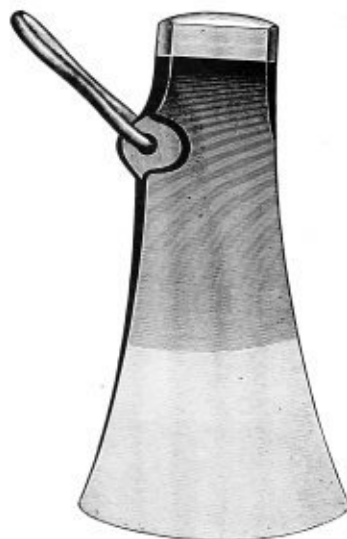


FIG. 5211

NO. 53 CRUCIBLE CAST
STEEL SAW WEDGE

With Wrought Iron Links

In sizes from 2½ to 5 pounds each.

Priceper pound \$0.18

ALL METAL TIMBER TRUCKS



FIG. 5212

No. 551. Steel frame, 15x17. Cast roller, 5 inches diameter.....each \$11.00

HORSE SHOE DOLLIES

With Wrought Steel Frame

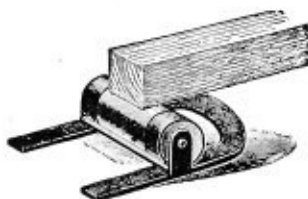


FIG. 5213

Price, with 4x14-inch Rock Maple Roller.....each	\$4.40
Price, with 6x14-inch Cast Iron Roller.....each	6.00

CAR DOOR ROLLERS

END DOOR ROLLER



FIG. 5314

SIDE DOOR ROLLER



FIG. 5315

END DOOR ROLLERS

Price	each	\$4.40
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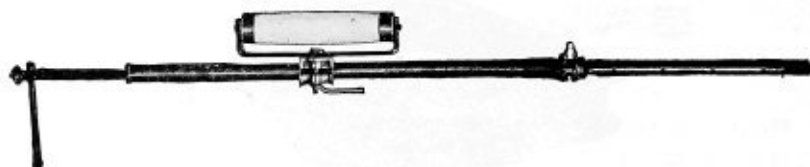
SIDE DOOR ROLLERS

Price	each	\$7.80
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Length of wood, 4½ ft.; screw, 16 ins.; entire length, 5 ft. 10 ins.; width of Roller, about 15 ins.

OSHKOSH DOUBLE EXTENSION LUMBER ROLLER

Extended Total Length, 8 feet



Contracted Total Length, 4½ feet



FIG. 5218

This Double Extension Lumber Roller costs you only a reasonable sum and enables you to load or unload cars in one-half the time formerly required and you lose no boards from splitting or breaking.

It is made of 2 inch steel pipe and will not sag under any reasonable load. Cars of timbers weighing 550 pounds each have been loaded with the small roller in the middle of the beam when fully extended—without the beam sagging.

The roller fits any door from 5 to 8 feet in width, as well as the end of a gondola. It is equipped with a telescopic pipe that can be set in multiples of 6 inches on one end and with a 1½ inch steel screw with heavy square cut threads and 18 inches long on the other. The small wooden roller is adjustable to any position on the beam and can be used at any angle. If desired, a small iron roller can be supplied in place of the wooden roller for a small additional charge.

No. 1. With 18 inch wood roller. Weight, 42 pounds.....list price, each \$15.00

No. 2. With 16 inch iron roller. Weight, 45 pounds.....list price, each 16.00

LANGAN'S PATENT GRAB HOOKS



FIG. 5219

The cut shows the Langan Drop Forged Steel Grab Hook used by all the leading lumbermen and considered the nearest perfect of any grab hook on the market. Made of special steel for the purpose and guaranteed against flaws and poor workmanship. The small tooth should be driven first, that puts the large tooth in a position to drive so it will not be on a strain after driving.

- | | | |
|--------|---|------------------|
| No. 4. | Can be used as crotch grabs or trailers, in ties, pulpwood or small hardwood logs. Weight, 27 ounces..... | per dozen \$5.00 |
| No. 2. | Regular hardwood trailers, also for medium size hemlock. Weight, 32 ounces..... | per dozen 5.25 |
| No. 3. | A regular soft wood grab. Weight, 37 ounces..... | per dozen 5.50 |
| No. 5. | For large soft wood. Weight, 40 ounces..... | per dozen 5.75 |

LOAD OR LOG BINDER

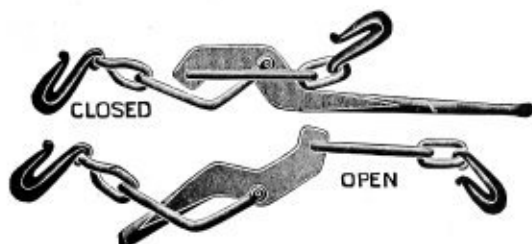


FIG. 5220

No. 651 Hand forged and unbreakable.....per dozen \$30.00

TRAILERS, GRABS, ETC.

No. 663 Trailer

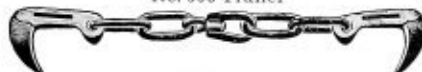


FIG. 5221

No. 662 Grab

No. 661 Grab



FIG. 5222



FIG. 5223

No. 664 Maul



FIG. 5224

No. 661	Crotch Grabs, hand forged.....	per dozen	\$42.00
No. 662	Carting Grabs, hand forged.....	" "	61.00
No. 663	Trailers with forged swivels.....	" "	32.00
No. 664	Grab Hauls	" "	16.00

LUMBERMEN'S AND BLACKSMITHS' APRONS AND HAND LEATHERS

No. 461



FIG. 5229

No. 561



FIG. 5230

No. 562



FIG. 5231

No. 563



FIG. 5232

Hand Leather



FIG. 5233

LUMBERMEN'S APRONS

Description.....	6-Inch Bibb and 33-Inch Neckstrap with Buckle	Plain	3-Inch Bibb	Shaped Top
Number	461	561	562	563
Size .....inches	26x27	26x21	26x24	26x21
Price .....per dozen	\$54.00	42.00	45.00	36.00

Our aprons are made from heavy russet stuffed split leather with one-inch hip straps and roller buckles. All straps fastened with rivets having smooth heads on both sides; above styles furnished with straight or scallop bottom.

HAND LEATHERS

6x9 inches, with opening for wrist.

Description	Light Split	Heavy Split	Extra Heavy Split
Number	590	591	592
Price .....per dozen pairs	\$2.70	3.60	4.50

CANVAS GLOVES

No. 100 with Gauntlet

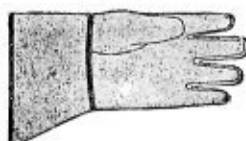


FIG. 5234

No. 200 Plain



FIG. 5235

No. 300 with Wristband



FIG. 5236

No. 100	price, per dozen	\$2.50
No. 200	price, per dozen	2.00
No. 300	price, per dozen	2.25

SCYTHE SNATHS



FIG. 5237

Fastening No. 45 and No. 50



FIG. 5238

Fastening No. 55



FIG. 5239

Price List Snaths

Ring Bush No. 100	No. 45. Grass Snath, Patent Loop, Adjustable Socket, Brass Ferrules .....price, per dozen	\$12.75
	No. 50. Grass Snath, Patent Loop, Adjustable Socket, Iron Trimmed .....price, per dozen	12.00
FIG. 5240	No. 55. Grass Snath, Patent Loop, Solid Plate, Iron Trimmed.....price, per dozen	12.00
	No. 100. Bush Snath, Two Rings.....price, per dozen	12.50
	No. 105. Bush Snath, Patent Loop.....price, per dozen	13.50
	Dutch, Mulay or Jersey Bend Snaths, list price, extra.....per dozen	1.25

Straight Snaths take the same list price as Bent Snaths with like trimmings.
All painted Snaths 25 cents net additional per dozen.

GRASS OR LAWN SCYTHES



FIG. 5241

Cutting Edge Polished

Lengths, assorted	inches	28 to 32	30 to 34	32 to 36
List price	per dozen	\$.....	.....	.....

Lengths are determined by measuring from outside of heel on a straight line to the point.

WEED SCYTHES



FIG. 5242

Heavy single bead blade enameloid finish; edge of back and cutting edge polished.

Lengths, assorted	inches	24 to 26	26 to 28	28 to 32
List price	per dozen	\$.....	.....	.....

BUSH HOOKS



FIG. 5243

FORGED TOOL STEEL, carefully tempered, well finished and properly handled. The blade is so shaped that it reinforces each part, making a strong tool throughout.

STRAPPED EYE HANDLED BUSH HOOKS

Numbers	9	10	11
Type	Light	Medium	Heavy
Weight, not including handle.....pounds	1¾	2¼	3
Length of handle.....inches	32	34	36
List price	per dozen	\$.....	.....

TWO RING UNHANDLED BUSH HOOKS

Numbers	12	112
Weight	pounds	2¾ 1¾
List price	per dozen	\$....

LAWN MOWERS

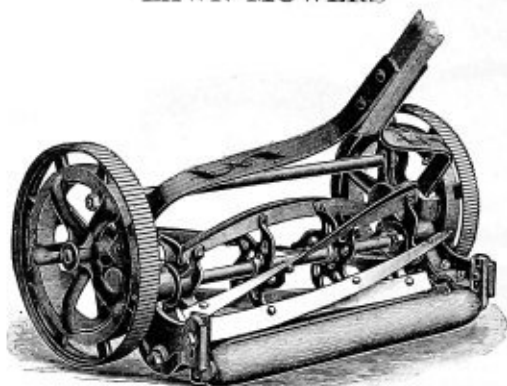


FIG. 5244

"BESTOVALL" BALL BEARING LAWN MOWERS

Ten inch raised rim open wheels. Five blade 6 inch reel. Highest grade ball bearings, thoroughly hardened. Micrometer tested, polished balls, protected by dust-proof cap. Best quality crucible steel blades. Lipped edge steel cutting bar. Durable. Easy running.

Size cut	inches	14	16	18	20
Price	each	\$17.00	18.00	19.00	20.00

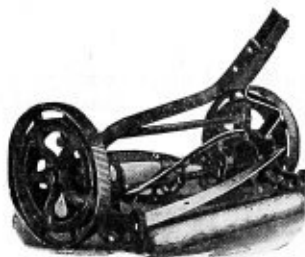
"GAGE SPECIAL" BALL BEARING LAWN MOWERS

FIG. 5245

Wheels, 9 inches in diameter, with raised rim. Four blade cutting reel, running in high-grade, dust-proof ball bearings. Polished ball of the best quality. All adjustments are simple and accurate. Durable, easy running.

Size cut.....	inches	14	16	18
Price	each	\$14.00	14.50	15.00

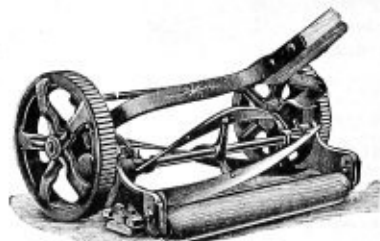
"MONARCH" LAWN MOWER

FIG. 5246

A Good Mower at a Low Price.

Open wheels, 8 $\frac{3}{4}$ inches. Three blade, 5 $\frac{1}{4}$ inch cutting cylinder, continuous shearing. Well made, accurately adjusted. High-grade brass bearings.

Size cut	inches	12	14	16
Price	each	\$9.00	9.50	10.00

PHILADELPHIA LAWN MOWERS STYLE "A" LAWN MOWER

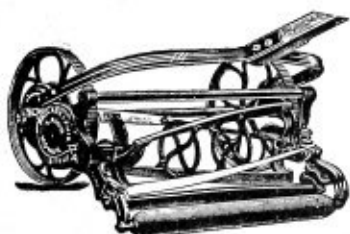


FIG. 5247

All steel. Cylinder with four blades. Driving wheel, 10 inches. Diameter of cylinder, $6\frac{1}{2}$ inches. Train of three gears on one side. Double ratchet.

This Mower is beyond criticism. It has a front girth or tie rod, and train of gears on one side only, which operates a double ratchet on the opposite side. Either wheel will drive cylinder. That this mower has fully met all requirements and satisfied men "who know" is demonstrated by the fact that there are more style "A" all steel mowers cutting grass in public and private parks, cemeteries and golf links throughout the

world than all other makes combined, because it does its work perfectly, and is practically indestructible. Equipped with self-oiling cups and Vanadium Crucible Steel blades.

Size	inches	15	17	19	21
List price	each	\$25.00	28.00	31.00	34.00

STYLE "E" LAWN MOWER

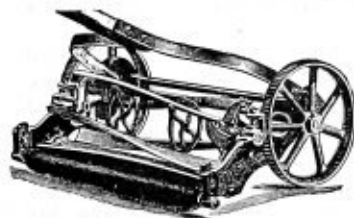


FIG. 5248

Cylinder with four blades. Driving wheel, 10 inches. Diameter of cylinder, $6\frac{1}{2}$ inches. Train of three gears on one side. Double ratchet. Removable box caps to take out cylinder for sharpening.

An exceptionally superior lawn mower made of the highest grade grey iron castings (our own alloy) and built in the sturdiest manner to successfully meet heavy and hard work under all conditions. All bearings are bored for extreme accuracy and are $\frac{1}{2}$ inch in diameter and $1\frac{3}{4}$ and 2 inches long, thus giving unusually long wear. The box caps are removable so that

cylinder can be taken out without disturbing frame or other adjustments. This mower is very popular among professional gardeners because of its many superior qualities. All blades are of Vanadium Crucible Steel. It is also equipped with self-oiling oil cups.

Size	inches	15	17	19	21
List price	each	\$25.00	28.00	31.00	34.00

STYLE "K" LAWN MOWER

Both Plain and Roller Bearing

Cylinder with five blades. Driving wheel, 10 inches. Diameter of cylinder, $6\frac{1}{2}$ inches. Single pinion. Geared both sides.

Made to meet the demand for a perfect general lawn mower giving the highest grade results. Bearings are $1\frac{3}{4}$ to $2\frac{1}{4}$ inches long and $\frac{1}{2}$ inch in diameter, bored for extreme accuracy. Operated by single pinion gears on each side. Made of highest grade grey iron castings (our own alloy). Unquestionably one of the most widely used mowers among professionals and laymen in the United States, and becoming more popular every year because of its wonderful

qualities. All blades made of Vanadium Crucible Steel.

Size	inches	14	16	18	20
List price, Plain Bearings	each	\$20.00	22.00	24.00	26.00
List price, Roller Bearings	each	20.00	22.00	24.00	26.00

PHILADELPHIA IMPROVED "EAGLE" HORSE MOWER

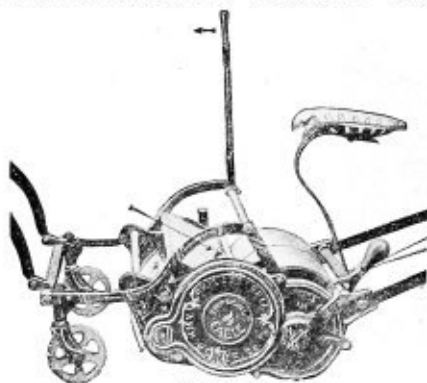


FIG. 5250

DESCRIPTION—Cylinder open, with five blades. Diameter of cylinder, $7\frac{1}{4}$ inches. Height of driving roller, 14 inches. Flexible frame.

This horse mower will cost you less for repairs, because we have eliminated useless parts, putting strength where needed. You can cover more ground because of the adjustments for handling the machine while working. The driver need never leave his seat, except to hitch or unhitch his horse. The Eagle is the only FLEXIBLE FRAME horse mower made.

The equipment can also be used as a lawn roller only, when desired.

To raise the frame, push the lever in direction of arrow, until the cross bar drops into the notch of the upright arm. This will cause the cylinder to clear the ground and keep it from running into any obstruction, making a clearance of $3\frac{1}{2}$ inches and thus preventing damage being done to the knives.

To let the frame down, push the lever in the direction of the arrow and at the same time push back the trip with the left heel, as shown by arrow. This will cause the frame to drop into position for use in the grass.

Another feature of this adjustment, not found in any other mower, is that by raising the frame, the tops of high grass can be cut and then by re-adjustment can be made to cut low grass.

This improved adjustment is easy, sure and positive.

The Improved Eagle Horse Mower is made of the best grey iron and steel castings it is possible to procure. It has a large, sturdy cylinder, $7\frac{1}{4}$ inches in diameter, with five Vanadium Crucible Steel Knives riveted to the spiders, insuring very close cutting and being specially adapted for golf links, parks, cemeteries, public institutions, etc.

The guaranty of the manufacturer is against all defects in workmanship and materials. We know if you will invest in one you will find your dividends in service very satisfactory.

Sold with Seat, Shafts and Side-Draft Attachments Only

Size	inches	30	35	40
List price	each	\$100.00	125.00	150.00

COLDWELL COMBINATION ROLLER AND MOTOR LAWN MOWERS

WALK TYPES—MODELS "G" AND "H"



FIG. 5251

In using this machine you simply have to guide the mower, by hand, negotiating any grade that a horse mower can be used on, and running a keen 30 inch or 35 inch cutter over six to eight acres per day. The operating handles are also used for raising and lowering the cutter unit over obstacles.

Model "G." 1,000 pounds, on
35 inch rollers.....price \$350.00

Model "H." 900 pounds, on 30
inch rollersprice 300.00



FIG. 5252

RIDE TYPE—MODEL "J"

is guaranteed to do the work of three men with three horse mowers. It is much lighter than any other "ride type" motor lawn mower ever manufactured. Consequently, it can be handled much more easily and its weight is just right for rolling the lawn.

Two Machines in One—For Rolling the Lawn and Cutting the Grass

Dimensions as follows: Width of cut, 40 inches; length over all, 7 feet; width over all, 4 feet; diameter of rollers, 15 inches; weight on drive rollers, 1,100 pounds. Continental engine (4 cyl.) 18 horsepower. Gasoline, $\frac{1}{2}$ to 1 gallon per hour. Hill climbing ability, 25 per cent grades. Cutting capacity, $1\frac{1}{2}$ -2 $\frac{1}{4}$ acres per hour. Height, 4 feet 3 inches.

Priceeach \$1,300.00

LAWN AND LAND ROLLERS

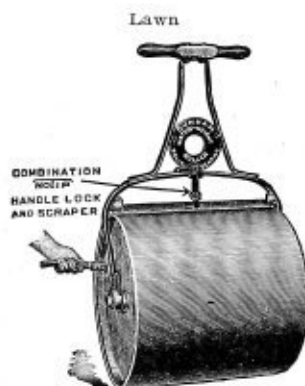


FIG. 5253

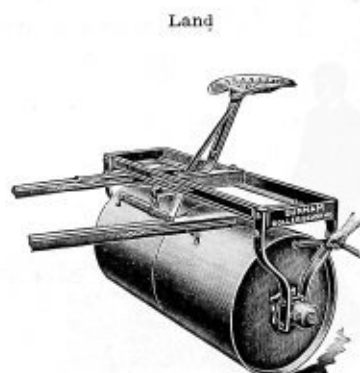


FIG. 5254

WATERWEIGHT[™] LAWN ROLLERS

Fitted with No-Tip Lock and Scraper.

No.	Diameter Inches	Length Inches	Sections	Weight Empty	Filled with Water	Price
WB 3	14	20	1	65 lbs.	200 lbs.	\$11.00
WB 5	18	24	1	80 lbs.	310 lbs.	13.00
WB 7	24	24	1	115 lbs.	500 lbs.	17.00
WB 9	24	32	1	130 lbs.	650 lbs.	19.00
WB 11	18	24	2	100 lbs.	330 lbs.	18.00
WB 13	24	32	2	160 lbs.	650 lbs.	24.00
WB 15	24	24	2	140 lbs.	500 lbs.	22.00

NOTE—We recommend "WB" 5 or "WB" 7 as the standard sizes.

"WATERWEIGHT" LAND ROLLERS

This roller is made on the same principle as the hand roller and is equipped with the famous Dunham Roller Bearings and furnished with shafts and singletree.

To give additional strength each of the drums has four heads. The two inside heads hold the water while the outside heads support the weight. This feature is necessary in the horse roller.

No.	Diameter Inches	Length Inches	Sections	Weight Empty	Filled with Water	Price
HWR 20	24	48	2	400 lbs.	1000 lbs.	\$55.00

SALAMANDERS

No. 1

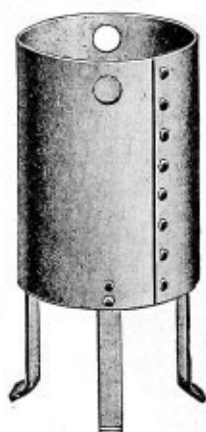


FIG. 5255

No. 2



FIG. 5256

Salamanders are used for heating cellars, buildings and contract work in course of construction—drying plaster and concrete, heating factories, etc—for burning paper, rubbish and disposing of garbage.

NO. 1 SALAMANDER

Made of 16 gage steel, 18 inches in diameter; length of shell, 2 feet; total height, 3 feet.

Extra Heavy Grate weighing about 30 pounds.

A bar inserted through the two holes at the top permits the Salamander to be easily moved while a hot fire is burning therein.

Price	each \$7.50
Extra Grates	each 2.00

NO. 2 SALAMANDER

Standard size, 16 inches in diameter; length body, 14 inches; total height, 28 inches. Has ash pan riveted to legs, with sliding door to remove ashes quickly.

Price	each \$8.50
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THE "BESTOVALL" SAND DRYING STOVE

FOR RAILROADS, TROLLEY LINES, CONTRACTORS,
COAL COMPANIES, ETC.



FIG. 5257

The above is a cut of the COMPLETE SAND DRIER. The wet sand is shoveled into the skirting, and as it dries, will of itself run through the holes in the ring at the bottom of the skirting. The amount of sand the stove will dry depends on how wet the sand is and on the condition of the fire in the stove. The stove may be fed with hard or soft coal, coke or wood. Clear sand only can be used. Earth or clay would bake hard, and so fail to run through holes in the ring.

Capacity under ordinary conditions: No. 1 dries about 10 tons daily. No. 2, about 5 tons daily. No. 1 weighs nearly 1,200 pounds. No. 2 weighs nearly 700 pounds. No. 3 is two-thirds the size and capacity of No. 2.

For sizes and prices, see following page.

THE "BESTOVALL" SAND DRYING STOVE

With Grating



FIG. 5258

Detail Cut Showing Name of Parts

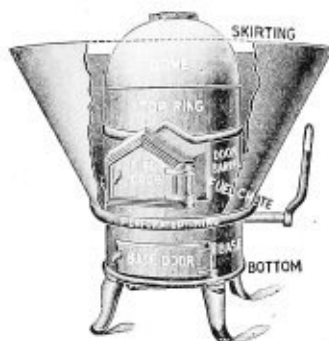


FIG. 5259

The above cut represents the Upright Cast Iron Grating with which we surround the main body of our Sand Drier to prevent the wet sand from coming into immediate contact with the hot furnace. There is an open air space of about $1\frac{1}{2}$ inches between the grating and the main body of the stove. As soon as the sand is dry it runs through this grating into the hot air space and then out through the perforated ring on which the skirting rests. This permits the wet sand to dry much more rapidly than when it comes into immediate contact with the hot stove. Some of our customers claim that it fully doubles the amount of sand that can be dried in the same length of time.

The grating adds greatly to the life of the stove by preventing baking of the sand and consequent burning of the castings. It is well worth the additional cost in this respect alone. The whole construction is for service and durability, and we feel confident that there is no stove for the purpose made superior in any respect to the one we herewith present.

No. Stove	1	2	3
Extreme height of Sand Dryers.....inches	58	49 $\frac{1}{2}$	48 $\frac{3}{4}$
Height from base to top.....inches	48	40	38 $\frac{1}{4}$
Height of legs.....inches	10	10	10
Size of fire-door.....inches	10x12	10x12	11x11
Inside diameter.....inches	23	17	15
Grate diameter.....inches	22	15	12 $\frac{1}{2}$
Skirting at top, diameter.....inches	52	40	39
Distance from inside fire-door to back of stove.....inches	33	27	23 $\frac{1}{4}$
Thickness of castings.....inches	1 $\frac{3}{4}$	7 $\frac{1}{2}$	3 $\frac{1}{2}$
Approximate capacity, cubic feet of sand.....	18 $\frac{1}{2}$	8 $\frac{1}{2}$	7 $\frac{1}{2}$
Weight, plain.....pounds	1,050	550	450
Weight, with external gratings.....pounds	1,235	675	550
Prices.....each	\$75.00	60.00	40.00
Gratings.....each	20.00	12.00	10.00

Gratings not furnished with the stoves unless so ordered. Parts may be ordered by designating names as shown in cut above.

PUNXSUTAWNEY SAND DRYING STOVE



FIG. 5260

Total height, 59½ inches. Greatest width of skirt, 55 inches. Weight, 1,425 pounds. Capacity, 1,600 to 1,800 pounds of damp sand to the charge.

This Sand Dryer consists of a very heavy cast-iron stove made in sections, so that the parts are easily renewed. The stove is enclosed by a heavy sheet iron skirt, resting on a perforated ring. Damp sand is shoveled into the skirt, and as it dries it falls through the holes in the perforated ring, so that the action of the Dryer is continuous.

The Dryer will furnish four to five tons of dry sand per day.

List price\$75.00

MOGUL HEATING STOVES

FOR STATIONS, SHOPS, CARS, OFFICES, ETC.

Will burn hard or soft coal, wood or natural gas.

Leg Base
Dome and Shelf Style

FIG. 5261

Closed Base
Dome and Shelf Style

FIG. 5262

Flat Top
Closed Base Style

FIG. 5263

Caboose Stove
With Fastenings for
Door and Ashpan, and
Lugs for bolting to floor
of Caboose.

FIG. 5264

These stoves are made from new patterns, and are superior in design and finish to any stove of the class on the market. Castings well fitted, free from burnt sand.

All stoves are furnished with Ashpan, Shaking and Dumping Grate, Lever, Shelf and Damper.

Weights and Dimensions on all Mogul Stoves:

No.	Diameter	Height	Weight
1	15 in.	40 in.	250
2	17 in.	45 in.	350
3	19 in.	50 in.	450

	Dome and Shelf style, Leg Base or Closed Base	Flat Top, Leg Base or Closed Base	Caboos	Long Bolts for Caboos Stoves, Per Set, Extra
No. 1	\$25.00	\$28.00	\$27.00	\$2.00
No. 2	35.00	38.00	37.25	2.25
No. 3	42.50	45.50	45.00	3.00

HEATING STOVES

"Terror"



FIG. 5265

"Modoc"



FIG. 5266

"TERROR" HEATING STOVE

A dwarf cannon stove. Extra heavy. Triple motion round basket grate. Basket in bottom of fire pot. Popular with railroads, warehouses, etc.

No.	1	2
List Price.....	each \$15.75	\$24.50
Height	28 inches	32
Diameter of fire pot.....	12 inches	15
Size pipe.....	6 inches	6
Weight	110 lbs.	164

"MODOC" HEATING STOVE

Shaking and dumping grate. A popular stove.

No. 16.	Height 27 inches, Diameter Top of Fire Pot 9 inches.....	\$ 6.75
No. 17.	Height 28 inches, Diameter Top of Fire Pot 10 inches.....	8.00
No. 18.	Height 30 inches, Diameter Top of Fire Pot 11 inches.....	10.25
No. 19.	Height 32 inches, Diameter Top of Fire Pot 12 inches.....	11.75
No. 20.	Height 34 inches, Diameter Top of Fire Pot 13½ inches.....	14.50
No. 21.	Height 36 inches, Diameter Top of Fire Pot 15 inches.....	17.75
No. 22.	Height 38 inches, Diameter Top of Fire Pot 17 inches.....	21.50

The Nos. 16 and 17 take 5-inch pipe.

The Nos. 18, 19, 20 and 21 take 6-inch, and No. 22 requires 7-inch.

HEATING AND LAUNDRY STOVES

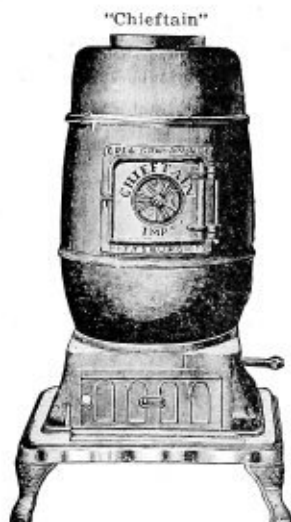


FIG. 5267



FIG. 5268

"CHIEFTAIN" HEATING STOVE

Gas and smoke consumer. An extra heavy, powerful heating stove. Flat top. Feet bolt fast to bottom. Loose cover in the top.

This stove is adapted to heating stores, warehouses and factories. It is especially popular with "public service" corporations.

Triple motion round basket grate. Hot blast cone super-heater saves fuel, increases heat. Basket in bottom of fire pot.

No.	14	16	18	20
List	each \$22.50	\$29.50	\$37.00	\$48.50
Diameter of fire pot.....inches	14	16	18	20
Height	inches 36	39	42	45
Weight	lbs. 166	233	292	406
Size of pipe collar.....inches	6	7	7	7

"CLIMAX GOOD LUCK" LAUNDRY STOVE

For coal. Dump and shaking grate. Large, high ash pit.

Height of stove, 21 inches; length of top, 21 inches; width of top, 19 inches. Use 6-inch pipe.

No. 15. Two 8-inch holes.....	\$13.50
-------------------------------	---------

HEATING STOVES



FIG. 5269

JUNIOR GOOD LUCK OAK

For hard coal, soft coal or wood.

Neatly designed, substantially made, automatic smoke plate, dump and shaking grate, feet 6 $\frac{3}{4}$ inches high, complete with ash pan.

The following parts are nicked: Top ring, name plate, lift-off foot rails, screw draft valve and door handles. The body is made of Wood's cold rolled steel, 18 gage.

List price,
each

No. 111.	Height to Urn Base 39 inches. Diameter of Fire Pot 11 inches.	\$16.00
No. 112.	Height to Urn Base 40 inches. Diameter of Fire Pot 12 inches.	 18.00
No. 113.	Height to Urn Base 44 inches. Diameter of Fire Pot 13 inches.	 20.00

GALVANIZED SPRINKLING CANS

Spout double-seamed to body.
Zinc top head.

"REMCO" one-piece handle (pat. app. for) makes this Sprinkling Pot easier to fill, easier to carry, easier to pour. No. 526 has boss on handle.

New No.	Size, inches	Trade Case cap'y, lots,		Price, doz.
		qt.	doz.	
514	6 $\frac{1}{4}$ x 6 $\frac{3}{4}$	4	$\frac{1}{2}$	\$....
516	7 $\frac{1}{4}$ x 7 $\frac{3}{4}$	6	$\frac{1}{2}$	....
518	7 $\frac{3}{4}$ x 9	8	$\frac{1}{2}$	....
520	8 $\frac{1}{4}$ x 9 $\frac{3}{4}$	10	$\frac{1}{2}$	....
522	9 $\frac{1}{4}$ x 10 $\frac{1}{2}$	12	$\frac{1}{4}$	....
526	10 $\frac{1}{4}$ x 11	16	$\frac{1}{4}$	....

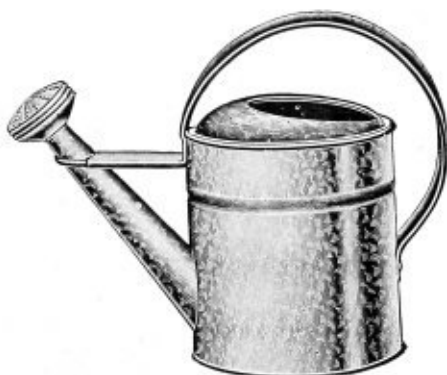


FIG. 5270

GALVANIZED COAL HODS



FIG. 5271

Open. Square nose. New and attractive design. Wide, half-oval bail.

No.	Size, inches	Bundle lots	Price, doz.
515	15	$\frac{1}{2}$ doz.	\$....
516	16	$\frac{1}{2}$ doz.	....
517	17	$\frac{1}{2}$ doz.	....
518	18	$\frac{1}{2}$ doz.	....
520	20	$\frac{1}{2}$ doz.	....

GALVANIZED COAL HODS

Extra Heavy.

Square nose. New and attractive design. Hollow steel back handle. Heavy wrought ears. Wide, half-oval bail. Two red bands. Attractive lithographed label on each article in this line.

No.	Size, inches	Bundle lots	Price, doz.
916	16	$\frac{1}{2}$ doz.	\$....
917	17	$\frac{1}{2}$ doz.	....
918	18	$\frac{1}{2}$ doz.	....



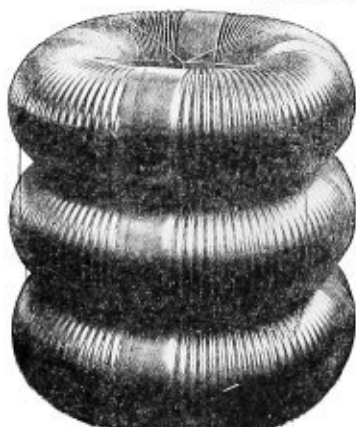
FIG. 5272

"SECURITY" NESTED STOVE PIPE**FIG. 5273**

Even Color Blue (Oiled).

No rivets necessary. To finish pipe, groove or hammer down seam. Projection in seam prevents opening. Can be cut at any length without affecting the strength.

Stock Sizes: 3, 4, 5, 5½, 6, 7 inches, 25 joints per crate. One-half lengths and taper joints.

"SECURITY" ELBOWS**FIG. 5274**

Even Blue Color.

One Piece Crimped (Oiled).

These Elbows are riveted both ends. Made to match "Security" Stove pipe in color and finish; handsome in appearance.

Stock Sizes: 3, 4, 5, 5½, 6 and 7 inches. Packed one dozen in a bundle, securely wired.

GRATES

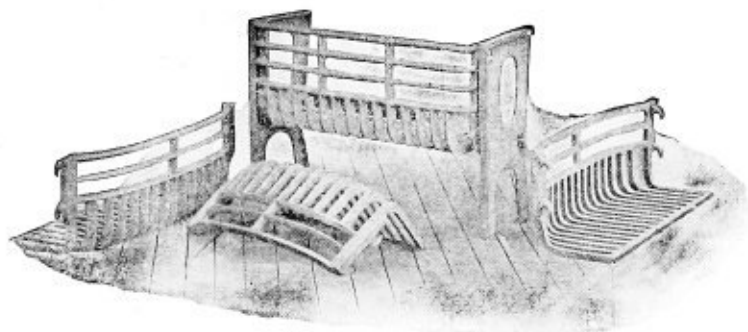


FIG. 5275

JAMB GRATES

Length, 16 inches.	Weight, 29 lbs.
Length, 18 inches.	Weight, 32 lbs.
Length, 20 inches.	Weight, 34 lbs.
Length, 22 inches.	Weight, 36 lbs.
Length, 24 inches.	Weight, 38 lbs.
Length, 30 inches.	Weight, 42 lbs.
Price	per lb. \$.

COMMON BASKET GRATES

With Two Lugs on Each Side.

Length, 16 inches.	Weight, 14½ lbs.
Length, 18 inches.	Weight, 17 lbs.
Length, 20 inches.	Weight, 18 lbs.
Length, 22 inches.	Weight, 19 lbs.
Length, 24 inches.	Weight, 20 lbs.
Price	per lb. \$.

KEYSTONE GRATES

No. 470. Open View.



FIG. 5275A

No. 472. Closed View



FIG. 5275B

These Grates use either hard or soft coal, coke or wood and are rapidly replacing gas fires and obsolete open fires.

Grate No. 470 has Frame $30\frac{1}{2}$ inches wide by $30\frac{1}{4}$ inches high, opening 24 inches, 12 inches deep. Shaker handle and rocker bar.

Grate No. 472 has Frame $24\frac{1}{2}$ inches wide by $30\frac{1}{4}$ inches high, opening 20 inches, 12 inches deep. Shaker handle and rocker bar.

Made in the following finishes:

List Prices

		No. 470 | No. 472	
Style 3.	Entire Front Surface Antique Bronze Electro Plate.....	\$28.00	\$30.00
Style 4.	Entire Front Surface Antique Brass Electro Plate.....	28.00	30.00
Style 9.	Entire Front Surface Berlin Black with Brass Knobs...	24.00	27.00

KEYSTONE GRATES Nos. 470 AND 472

"INSIDE INFORMATION"

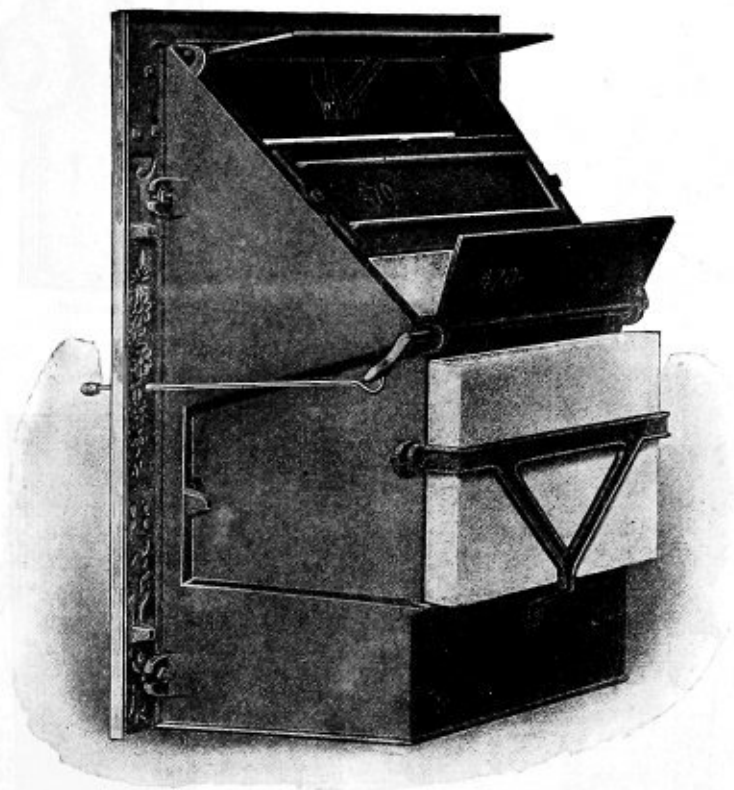


FIG. 5275C

Above illustration shows rear view construction of Keystone Grates.

For hard coal, soft coal, coke or wood. Double adjustable control dampers. Shaking and dumping grate. As easily installed as a stove and equally as cleanly. Very heavy tile back wall. Ventilated side walls. Durability is assured.

CARVELL DESIGN

Bit-Key Front Door Set
Showing Seamless Knob
CV656-5561
CV956-5521

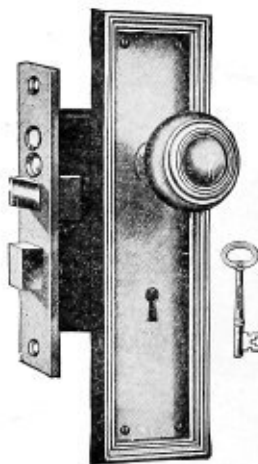


FIG. 5276

See Opposite Page for
Description

Cylinder Front Door Set
Showing Seamless Knob
CV696-9500

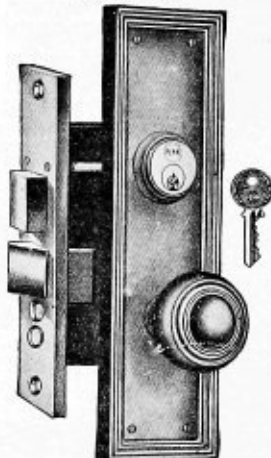


FIG. 5277

Bit-Key Inside Door Set
Showing Two-Piece Knob
CV925-2327

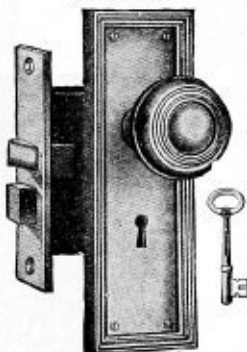


FIG. 5278

Push Plate
CV975

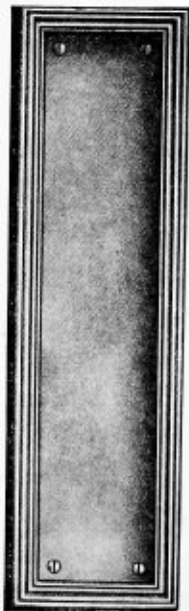


FIG. 5282

Flush Sash Lift
CV955



FIG. 5280

Electric Push Button



FIG. 5281

Sliding Door Set
CV914-1420
CV914-1421

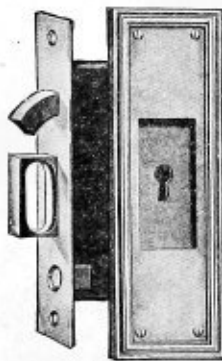


FIG. 5279

CARVELL DESIGN
WROUGHT BRONZE METAL AND WROUGHT STEEL
CYLINDER FRONT DOOR SETS
WROUGHT BRONZE METAL

Set Number	Lock		Knobs 2 $\frac{1}{4}$ Inch	Escutcheons		Price Per Set
	No.	Inch		Outside	Inside	
				Inch	Inch	
CV 606-9500	9500	5 $\frac{1}{2}$ x 3 $\frac{3}{4}$	Seamless	10 $\frac{1}{2}$ x 3	8 x 2 $\frac{5}{8}$	.....
CV 605-9500	9500	5 $\frac{1}{2}$ x 3 $\frac{3}{4}$	Two Piece	10 $\frac{1}{2}$ x 3	8 x 2 $\frac{5}{8}$	.....

BIT-KEY FRONT DOOR SETS
WROUGHT BRONZE METAL

Set Number	Lock		Knobs 2 $\frac{1}{4}$ Inch	Escutcheons		Price Per Set
	No.	Inch		Outside	Inside	
CV 656-5561	5561	5 x 3 $\frac{1}{2}$	Seamless	10 $\frac{1}{2}$ x 3	8 x 2 $\frac{5}{8}$	.....
CV 655-5561	5561	5 x 3 $\frac{1}{2}$	Two Piece	10 $\frac{1}{2}$ x 3	8 x 2 $\frac{5}{8}$	.....

WROUGHT STEEL

CV 956-5521	5521	$5 \times 3\frac{1}{2}$	Seamless	$10\frac{1}{2} \times 3$	$8 \times 2\frac{5}{8}$	.....
CV 955-5521	5521	$5 \times 3\frac{1}{2}$	Two Piece	$10\frac{1}{2} \times 3$	$8 \times 2\frac{5}{8}$	.....

INSIDE DOOR SETS
WROUGHT STEEL

Set Number	Lock		Knobs 2 ¹ / ₄ Inch	Two Escutcheons		Price Per Dozen Sets
	No.	Inch		No.	Inch	
CV 926-2327	2327	3 ⁵ / ₈ x 3 ¹ / ₂	Seamless	CV 908	8 x 2 ⁵ / ₈	.....
CV 925-2327	2327	3 ⁵ / ₈ x 3 ¹ / ₂	Two Piece	CV 908	8 x 2 ⁵ / ₈	.....

SLIDING DOOR SETS
WROUGHT STEEL

Set Number	Lock			Flush Cap Escutcheons		Price Per Set
	No.	Inch	Front	No.	Inch	
				No.	Inch	
CV 914-1420	1420	$5\frac{1}{2} \times 3\frac{1}{4}$	Flat-Single	2-CV 908S	$8 \times 2\frac{5}{8}$	.....
CV 914-1421	1421	$5\frac{1}{2} \times 3\frac{1}{4}$	Flat-Double	4-CV 908S	$8 \times 2\frac{5}{8}$	.....
CV 914-1422	1422	$5\frac{1}{2} \times 4\frac{1}{8}$	Astragal	4-CV 908S	$8 \times 2\frac{5}{8}$	.....

MISCELLANEOUS HARDWARE

Number		Inch		Price Per Dozen
Wrought Bronze Metal	Wrought Steel			
CV 640	.....	$3\frac{3}{4} \times 1\frac{3}{4}$	Electric Push Button	.....
.....	CV 955	$1\frac{3}{4} \times 3\frac{3}{4}$	Flush Sash Lift	.....
.....	CV 975	$10\frac{1}{2} \times 3$	Push Plates	.....

Finishes suitable { Antique Copper
 { Dull Brass Relieved
 { Sanded Brass
 (Specify Finish)

Packing { Lock Sets—One Set in a Box.
 { Inside Door Sets—Five Doz.
 in a Case.

CORNING DESIGN

Bit-Key Front Door Set
CN655-5561
CN955-5521

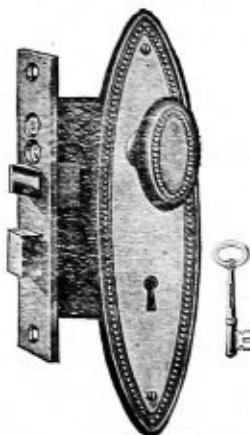


FIG. 5283

See Opposite Page for
Description

Cylinder Front Door Set
CN695-9500

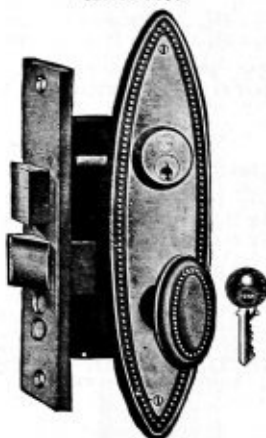


FIG. 5284

Bit-Key Inside Door Set
CN925-9718 1/8



FIG. 5285

Push Plate
CN975

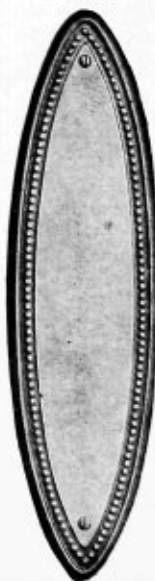


FIG. 5289

Flush Sash Lift
CN955



FIG. 5287

Sliding Door Set
CN914-1420
CN914-1421

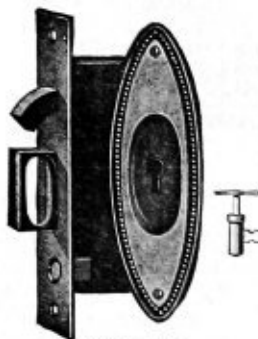


FIG. 5286

Electric Push Button
CN640



FIG. 5288

DERBY DESIGN

See Opposite Page for Description

Bit-Key Front Door Set
Showing Two-Piece Knob
DB 655-5561
DB 955-5521

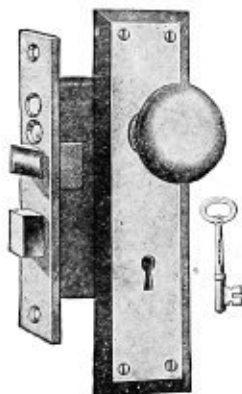


FIG. 5290

Cylinder Front Door Set
Showing Seamless Knob
DB696-9500

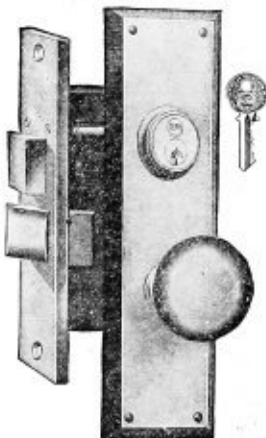


FIG. 5291

Bit-Key Inside Door Set
Showing Seamless Knob
DB926-9718 1/8

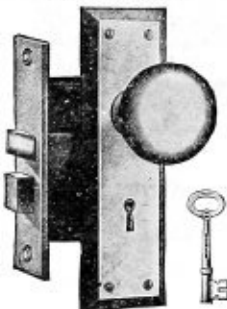


FIG. 5292

Push Plate
DB975

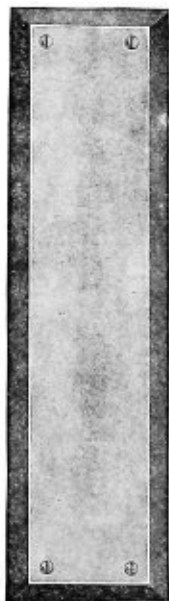


FIG. 5296

Flush Sash Lift
DB955



FIG. 5294

Sliding Door Set
DB914-1420
DB914-1421



FIG. 5293

Electric Push Button
DB640



FIG. 5295

DERBY DESIGN
WROUGHT BRONZE METAL AND WROUGHT STEEL

CYLINDER FRONT DOOR SETS
WROUGHT BRONZE METAL

Set Number	Lock		Knobs 2 $\frac{1}{4}$ Inch	Escutcheons		Price Per Set
	No.	Inch		Outside Inch	Inside Inch	
DB696-9500	9500	5 $\frac{1}{2}$ x3 $\frac{3}{4}$	Seamless Two Piece	10 $\frac{1}{2}$ x2 $\frac{3}{4}$	7x2 $\frac{1}{4}$	.....
DB695-9500	9500	5 $\frac{1}{2}$ x3 $\frac{3}{4}$		10 $\frac{1}{2}$ x2 $\frac{3}{4}$	7x2 $\frac{1}{4}$	.....

BIT-KEY FRONT DOOR SETS
WROUGHT BRONZE METAL

Set Number	Lock		Knobs 2 1/4 Inch	Escutcheons		Price Per Set
	No.	Inch		Outside Inch	Inside Inch	
DB656-5561	5561	5x3 1/2	Seamless Two Piece	10 1/4 x 2 3/4	7x2 1/4	.....
DB655-5561	5561	5x3 1/2		10 1/4 x 2 3/4	7x2 1/4	.....

WROUGHT STEEL

DB956-5521	5521	5x3 $\frac{1}{2}$	Seamless	10 $\frac{1}{2}$ x23 $\frac{3}{4}$	7x2 $\frac{1}{4}$	.....
DB955-5521	5521	5x3 $\frac{1}{2}$	Two Piece	10 $\frac{1}{2}$ x23 $\frac{3}{4}$	7x2 $\frac{1}{4}$	.....

INSIDE DOOR SETS
WROUGHT STEEL

Set Number	Lock		Knobs 2 1/4 Inch	Two Escutcheons		Price Per Dozen Sets
	No.	Inch		No.	Inch	
DB926-97181 1/4 S	97181 1/4 S	3 1/4 x 3 1/4	Seamless Two Piece	DB907	7 x 2 1/4	.....
DB925-97181 1/4 S	97181 1/4 S	3 1/4 x 3 1/4		DB907	7 x 2 1/4	.....

SLIDING DOOR SETS
WROUGHT STEEL

Set Number	Lock			Flush Cup Escutcheons		Price Per Set
	No.	Inch	Front	No.	Inch	
DB914-1420	1420	5 1/2 x 3 1/4	Flat Single	2-DB907S	7 x 2 1/4	.....
DB914-1421	1421	5 1/2 x 3 1/4	Flat Double	4-DB907S	7 x 2 1/4	.....
DB914-1422	1422	5 1/2 x 4 1/8	Astragal	4-DB907S	7 x 2 1/4	.....

MISCELLANEOUS HARDWARE

Number		Inch	Price Per Dozen
Wrought Bronze Metal	Wrought Steel		
DB640		3 1/4 x 1 5/8	Electric Push Button
	DB955	1 9/8 x 3 1/4	Flush Sash Lift
	DB975	1 0 1/2 x 2 3/4	Push Plate

Finishes Suitable { Natural Finish Packing { Lock Sets, One Set in a Box.
 { Antique Copper { Inside Door Sets, 5 Doz. in a Case.
 { Dull Brass, Specify Finish.

DOUGLASS DESIGN

Bit-Key Front Door Set

DL655-5561

DL955-5521

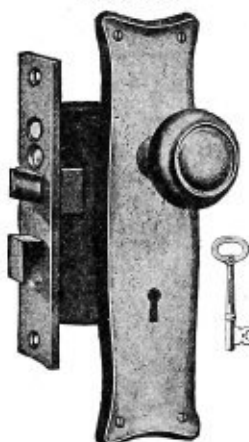


FIG. 5297

See Opposite Page for Description

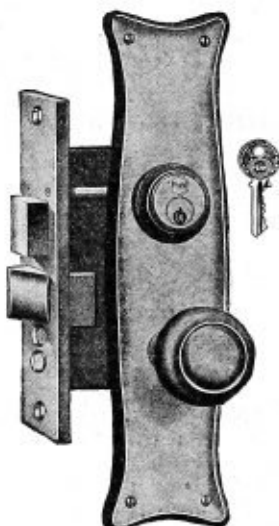
Cylinder Front Door Set
DL695-9500

FIG. 5298

Bit-Key Inside Door Set
DL925-2327

FIG. 5299

Push Plate
DL975

FIG. 5303

Sliding Door Set

DL914-1426

DL914-1421

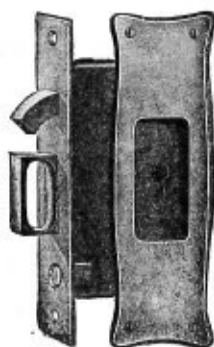


FIG. 5300

Flush Sash Lift
DL955

FIG. 5301

Electric Push Button
DL640

FIG. 5302

DOUGLASS DESIGN
WROUGHT BRONZE METAL AND WROUGHT STEEL
CYLINDER FRONT DOOR SET
WROUGHT BRONZE METAL

Set Number	Lock		Knobs 2 $\frac{1}{4}$ Inch	Escutcheons		Price Per Set
	No.	Inch		Outside Inch	Inside Inch	
DL695-9500	9500	5 $\frac{1}{2}$ x3 $\frac{1}{4}$	Two Piece	10x2 $\frac{3}{4}$	7 $\frac{3}{4}$ x2 $\frac{1}{2}$	.....

BIT-KEY FRONT DOOR SET
WROUGHT BRONZE METAL

Set Number	Lock		Knobs 2 $\frac{1}{4}$ Inch	Escutcheons		Price Per Set
	No.	Inch		Outside Inch	Inside Inch	
DL655-5561	5561	5x3 $\frac{1}{2}$	Two Piece	10x2 $\frac{3}{4}$	7 $\frac{3}{4}$ x2 $\frac{1}{2}$	

WROUGHT STEEL

DL955-5521	5521	5x3 $\frac{1}{2}$	Two Piece	10x2 $\frac{3}{4}$	7 $\frac{3}{4}$ x2 $\frac{1}{2}$	
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INSIDE DOOR SET
WROUGHT STEEL

Set Number	Lock		Knobs 2 $\frac{1}{4}$ Inch	Two Escutcheons		Price Per Dozen Sets
	No.	Inch		No.	Inch	
DL925-2327	2327	3 $\frac{3}{4}$ x3 $\frac{1}{4}$	Two Piece	DL907 $\frac{3}{4}$	7 $\frac{3}{4}$ x2 $\frac{1}{2}$	.....

SLIDING DOOR SETS
WROUGHT STEEL

Set Number	Lock			Flush Cup Escutcheons		Price Per Set
	No.	Inch	Front	No.	Inch	
DL914-1420	1420	5 $\frac{1}{2}$ x3 $\frac{1}{4}$	Flat, Single	2-DL907 $\frac{3}{4}$ S	7 $\frac{3}{4}$ x2 $\frac{1}{2}$	.....
DL914-1421	1421	5 $\frac{1}{2}$ x3 $\frac{1}{4}$	Flat, Double	4-DL907 $\frac{3}{4}$ S	7 $\frac{3}{4}$ x2 $\frac{1}{2}$	.....
DL914-1422	1422	5 $\frac{1}{2}$ x4 $\frac{1}{8}$	Astragal	4-DL907 $\frac{3}{4}$ S	7 $\frac{3}{4}$ x2 $\frac{1}{2}$	.....

MISCELLANEOUS HARDWARE

Number		Inch		Price Per Dozen
Wrought Bronze Metal	Wrought Steel			
DL640	.....	3 $\frac{3}{4}$ x1 $\frac{1}{2}$	Electric Push Button Flush Sash Lift Push Plate	.....
.....	DL955	1 $\frac{1}{2}$ x3 $\frac{3}{4}$		.....
.....	DL975	10x2 $\frac{3}{4}$		.....

Finishes suitable { Antique Copper
 { Dull Brass

Packing { Lock Sets—One Set in a Box
 { Inside Door Sets—Five Doz.
 in a Case

Specify Finish

STORE DOOR HANDLE SETS

SEE OPPOSITE PAGE FOR DESCRIPTION

Carvell Design
CV668-6542

FIG. 5304

Derby Design
DB669-6542

FIG. 5305

Dunkirk Design
DK962-6181

FIG. 5306

Carvell Design
CV668-6185
CV968-6181

FIG. 5307

STORE DOOR HANDLE SETS
WROUGHT BRONZE METAL AND WROUGHT STEEL

CYLINDER STORE DOOR HANDLE SETS
TWO HANDLES COMPLETE AND TWO CYLINDERS

Set Number	Design	Lock		Two Plates	Two Grips	Price Per Set
		No.	Inch	Wrought Bronze Metal	Centre to Centre	
CV668 6542	Carvell	6542	4x3 $\frac{1}{2}$	14 $\frac{1}{2}$ x3 $\frac{1}{4}$ ins.	5 $\frac{3}{8}$ ins.	.....
DB669 6542	Derby	6542	4x3 $\frac{1}{2}$	14 $\frac{1}{2}$ x3 $\frac{1}{8}$ ins.	5 $\frac{3}{8}$ ins.	.....

Keys—3 German Silver

Cylinders for Doors 1 $\frac{3}{4}$ to 2 $\frac{1}{4}$ ins. thick

One Set in a Box

FLAT-KEY STORE DOOR HANDLE SETS
TWO HANDLES COMPLETE

Set Number	Design	Lock		Two Plates	Two Grips	Price Per Set
		No.	Inch	Wrought Bronze Metal	Centre to Centre	
CV668-6185	Carvell	6185	4x3 $\frac{1}{8}$	14 $\frac{1}{2}$ x3 $\frac{1}{8}$ ins.	5 $\frac{3}{8}$ ins.	.....
DB669-6185	Derby	6185	4x3 $\frac{1}{8}$	14 $\frac{1}{2}$ x3 $\frac{1}{8}$ ins.	5 $\frac{3}{8}$ ins.	.....

TWO HANDLES COMPLETE

Set Number	Design	Lock		Two Plates	Two Grips	Price Per Set
		No.	Inch	Wrought Bronze Metal	Centre to Centre	
CV968-6181	Carvell	6181	4x3 $\frac{1}{8}$	14 $\frac{1}{2}$ x3 $\frac{1}{8}$ ins.	5 $\frac{3}{8}$ ins.	.....
DB969-6181	Derby	6181	4x3 $\frac{1}{8}$	14 $\frac{1}{2}$ x3 $\frac{1}{8}$ ins.	5 $\frac{3}{8}$ ins.	.....
DK962-6181	Dunkirk	6181	4x3 $\frac{1}{8}$	12x3 ins.	4 $\frac{7}{8}$ ins.	.....

Keys—2 Nickel Plated Flat Steel—One Set in a Box

Finishes Suitable

Carvell Design	{	Antique Copper	Derby Design	{	Natural Finish
		Dull Brass Relieved			Antique Copper
		Sanded Brass			Dull Brass

Specify Finish

CYLINDER STORE DOOR LOCK	FLAT-KEY STORE DOOR LOCK
No. 6542 — 4x3 $\frac{1}{2}$ x3 $\frac{3}{4}$ Inch	No. 6185—4x3 $\frac{1}{8}$ x3 $\frac{1}{8}$ Inch
Front—Flat 6 $\frac{1}{2}$ x1 $\frac{1}{4}$ Inch Cast Bronze	Front—Flat 6 $\frac{1}{2}$ x1 $\frac{1}{8}$ Inch Cast Bronze
Case—Japanned Iron	Case—Japanned Iron
Bolts—Cast Bronze	Bolts—Cast Bronze
Reversible—By removing Cap	Reversible—By removing Cap
Keys—3 German Silver, Changes Unlimited	Keys—2 Nickel Plated Flat Steel 72 Changes
Spacing—3 $\frac{1}{4}$ Inch	Spacing—2 $\frac{3}{8}$ Inch
Backset—2 $\frac{1}{2}$ Inch	Backset—2 $\frac{3}{8}$ Inch
Operation—Latch Bolt from both sides by Thumb Piece—Dead Bolt by Key from both sides	Operation—Latch Bolt from both sides by Thumb Piece—Dead Bolt by Key from both sides

No. 6181 Lock Same as No. 6185 But with Cast Iron Plated Front and Bolts

No. 949J-6602

MILL HANDLE SETS

No. 949J-6185



FIG. 5308

EXTRA HEAVY—JAPANNED
FOR MILL AND FACTORY DOORS

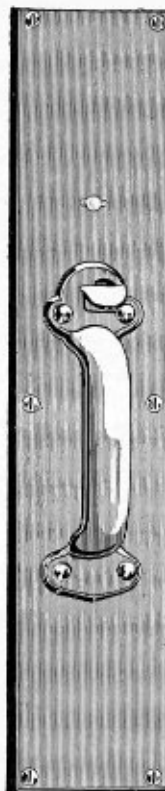


FIG. 5309

CYLINDER MILL HANDLE SET

Set Number	Lock		Cylinders	Two Plates		Two Grips	Per Set
	No.	Inch	Two	Wrought Steel	Inch	Size Over All	
949J-6602	6602	5½x3¾	Bronze Metal	Japanned	20x4	Cast Iron 8¾ inch	.....

FLAT KEY MILL HANDLE SET

Set Number	Lock		Two Plates		Two Grips	Per Set
	No.	Inch	Wrought Steel	Inch	Size Over All	
949J-6185	6185	4x3	Japanned	20x4	Cast Iron-8¾ inch	.....

One set in a box. Complete with machine bolts.

DOOR HANDLE LATCHES EITHER RIGHT OR LEFT HAND—FOR MILL AND FACTORY DOORS

Nos. 850A and 850



FIG. 5310

No. 209

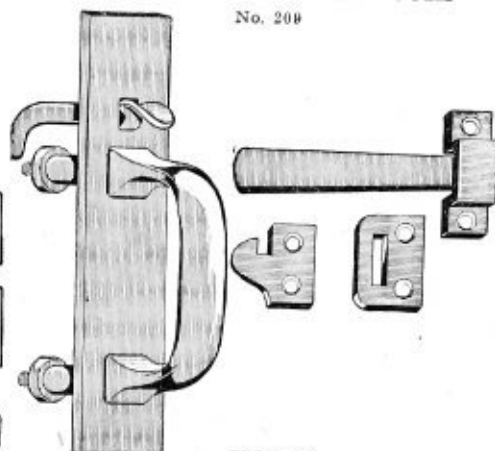


FIG. 5311

CAST IRON—EXTRA HEAVY

Number	Plate	Latch	Thumb Piece	Grip Centre to Centre	Finish	Price Per Dozen
850A	9 3/4 x 2 1/4 in.	3 7/8 in.	5 3/4 in.	5 5/8 in.	Amber	.....
850	9 3/4 x 2 1/4 in.	3 7/8 in.	5 3/4 in.	5 5/8 in.	Plated, Black Background	.....
209	10 x 2 1/2 in.	Wrgt 6 1/4 in.	6 3/8 in.	4 3/4 in.	Japanned	.....

Quarter Dozen in a Box

THUMB LATCHES CAST IRON—WITH SCREWS

Nos. 36 and 38

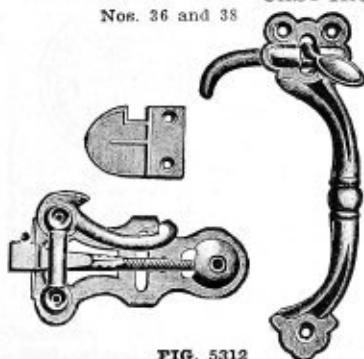


FIG. 5312

No. 840A



FIG. 5313

Number	Length of Handle	Length of Latch	Finish	Price Per Doz.
36	5 3/4 in.	4 in.	Japanned	.....
38	6 1/2 in.	4 1/8 in.	Japanned	.....
840A	6 1/2 in.	4 1/4 in.	Amber	.....

One Dozen in a Box

CYLINDER RIM NIGHT LATCHES

For Doors:
 $\frac{1}{2}$ to 3 inches
 Thick
 Backset:
 $2\frac{1}{4}$ inches

REVERSIBLE

No. 321

Operation:
 By key outside
 and by
 Turn Knob
 inside. Bolt
 may be held
 back by stop.



Class 506



Rev. Bevel Strike

Rim Strike

FIG. 5314

Cast Bronze Metal

Number	Size Inch	Case Cast Iron	Stop and Bolt	Turn Knob	Three Keys	Changes	Per Doz.
321	2x3	Japanned	Iron Bronze Plated	Steel Bronze Plated	German Silver	7500	.....

Complete with screws. One in a box. Six dozen in a case.

Class 510

Rev. Bevel
StrikeRim
Strike

Nos. 372 and 372AC

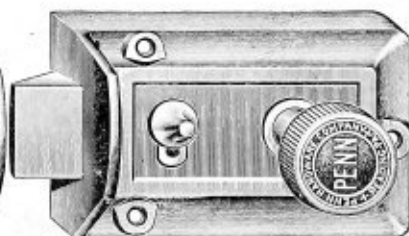
Cylinder
Cast Bronze Metal

FIG. 5315

Number	Size Inch	Case Cast Iron	Cylinder Stop and Bolt	Turn Knob	Three Keys	Changes	Per Doz.
372	$2\frac{1}{4} \times 3\frac{3}{8}$	Japanned	Cast Bronze	Bronze	German Silver	Unlim- ited	.....
372AC	$2\frac{1}{4} \times 3\frac{3}{8}$	Ant. Copper	Cast Bronze	Bronze	German Silver	Unlim- ited	.....

Complete with screws.

One in a box.

Six dozen in a case.

For doors $\frac{1}{2}$ to 3 inches thick.Backset $2\frac{3}{4}$ inches.

OPERATION

Double Stop Action: Operated by key outside and by turn knob inside. Bolt may be held back by stop. The bolt may also be dead-locked by stop, either in or out, so it cannot be operated by the key.

MASTER KEYING

Can be furnished master keyed and grand master keyed, with master key to pass all sets.

TUBULAR RIM NIGHT LATCHES

REVERSIBLE

Nos. 233, 233DB and 233AC



FIG. 5316

OPERATION

By key outside, by turn knob inside. An extra turn of knob serves as stayback for bolt.

Number	Size Inches	Case	Bolt	Iron Turn Knob	Two Keys	Changes	Per Dos.
233	2x3	Japanned	Pol'd Iron	Brass Plated	NP Flat St'l	36	.....
233DB	2x3	Dull Brass Pltd	Brass Pltd Iron	Dull Brass Pltd	NP Flat St'l	36	.....
233 AC	2x3	Ant. Copper "	Brass Pltd Iron	Ant. Copper "	NP Flat St'l	36	.....

Complete with screws. One in a box. Six dozen in a case.

Nos. 265 to 269

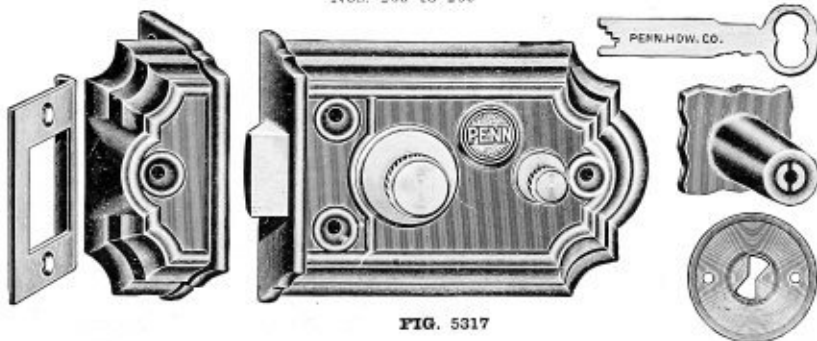


FIG. 5317

Operation: By key outside and by knob inside. Bolt may be set by stop in or out.

Number	Size Inches	Case	Bolt	Slide Knob and Stop	Two Keys	Changes	Per Dos.
265	3x4	Japanned	Iron	NP Brass	NP Flat Steel	150	.....
267	3x4	Japanned	Brass Pltd Iron	NP Brass	NP Flat Steel	150	.....
269	3x4	Japanned	Brass	NP Brass	NP Flat Steel	150	.....

Complete with screws. One in a box. Six dozen in a case.

YALE CYLINDER RIM NIGHT LATCHES CUTS ONE-THIRD SIZE

No. 42

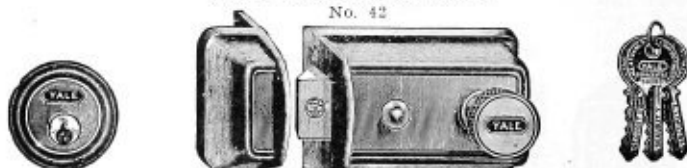


FIG. 5318

No. 42. Case $2\frac{3}{8} \times 3\frac{1}{2} \times 1$ in.; iron, old copper finish; bronze bolt, cylinder and knobs; 5 pin-tumblers; back-set $2\frac{3}{8}$ inches; 3 paracentric keys, changes practically unlimited. Operated from outside by key, from inside by knob. Bolt may be held back by stop.....dozen \$33.60

Packed each in a box with screws.

No. 44

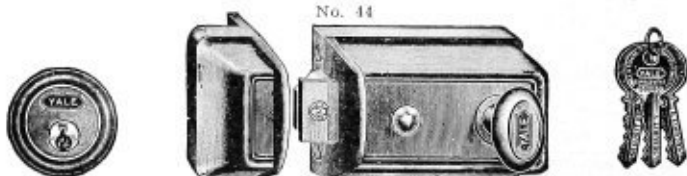


FIG. 5319

No. 44. Case $2\frac{3}{8} \times 3\frac{1}{2} \times 1\frac{1}{4}$ in.; iron, old copper finish; bronze bolt, cylinder and knobs; 5 pin-tumblers; back-set $2\frac{3}{8}$ inches; 3 paracentric keys, changes practically unlimited. Operated from outside by key, from inside by knob. Bolt may be held back by stop.....dozen \$38.65

Packed each in a box with screws.

No. 37

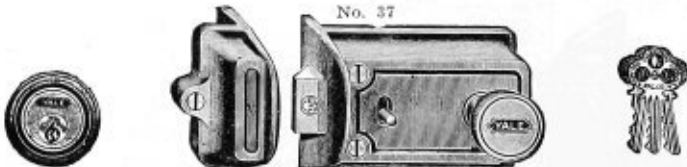


FIG. 5320

No. 37. Case $2 \times 3\frac{3}{8} \times 1$ in.; iron, japanned; bronze bolt, cylinder and knobs; 4 pin-tumblers; 3 corrugated keys, 1500 changes; back-set $2\frac{3}{8}$ inches. Operated from outside by key, from inside by knob. Bolt may be held back by stop...doz. \$23.10

Packed each in a box with screws.

No. 34

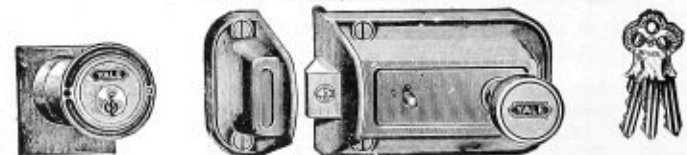


FIG. 5321

No. 34. Case $2\frac{1}{4} \times 3\frac{1}{2} \times \frac{7}{8}$ in.; iron, japanned; bronze bolt, cylinder and knobs; 4 pin-tumblers; back-set $2\frac{3}{8}$ inches; 3 corrugated keys, 1500 changes. Operated from outside by key, from inside by knob. Bolt may be held back by stop...doz. \$21.15

Packed each in a box with screws.

DOOR KNOBS

MINERAL, PORCELAIN AND JET

Rim Knob



FIG. 5322

No. 92 1/4



FIG. 5323

COMPLETE WITH SCREWS

Number		Size 2 1/4 Inch	Shank 3/8 Inches	Roses 2 Inch	Finish	Per Doz.
Rim	Mortise					
110	100	Mineral	Cast Iron	Cast Iron	Japanned	.....
210	200	Porcelain	Cast Iron	Cast Iron	Japanned	.....
310	300	Jet	Cast Iron	Cast Iron	Japanned	.....
92 1/4	92 1/4	Wright Steel	Wright Steel	Wright Steel	Nat'l Color	.....

One dozen pairs in a box. 12 dozen pairs in a case.

HORIZONTAL RIM KNOB LATCHES

REVERSIBLE

No. 281

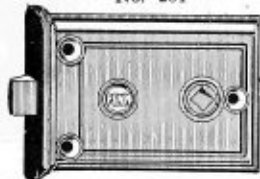


FIG. 5324

No. 284

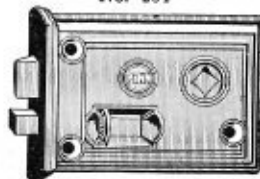


FIG. 5325

COMPLETE WITH SCREWS

Number	Size Inches	Case	Bolts	Strike	Without Knobs Per Doz.
281	2 5/8 x 3 1/4	Japanned Iron	Iron	Iron	.....
284	2 5/8 x 3 1/4	Japanned Iron	Iron	Iron	.....

One-half dozen in a box. 20 dozen in a case.

HORIZONTAL RIM KNOB LOCKS REVERSIBLE

With Stop
Nos. 801 and 806

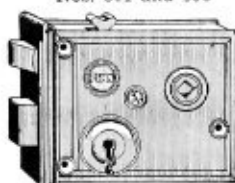


FIG. 5326

With Slide Bolt
Nos. 811 and 816



FIG. 5327

WITHOUT KNOBS

Number	Size Inches	Bolts	One Key	Changes	Without Knobs Per Dozen
801	3 $\frac{3}{8}$ x4 $\frac{1}{4}$	Iron	Tinned Malleable Iron	6	.....
806	3 $\frac{3}{8}$ x4 $\frac{1}{4}$	Brass Plated Iron	Brass	6	.....
811	3 $\frac{3}{8}$ x4 $\frac{1}{4}$	Iron	Tinned Malleable Iron	6	.....
816	3 $\frac{3}{8}$ x4 $\frac{1}{4}$	Brass Plated Iron	Brass	6	.....

Complete with screws. Ten dozen in a case.

RIM LOCK SETS

Set Number	Lock	Size Inches	With One Pair Knobs	Per Dozen
801x110	801	3 $\frac{3}{8}$ x4 $\frac{1}{4}$	No. 110 Mineral	.....
801x210	801	3 $\frac{3}{8}$ x4 $\frac{1}{4}$	No. 210 Porcelain	.....
801x310	801	3 $\frac{3}{8}$ x4 $\frac{1}{4}$	No. 310 Jet	.....
865x92 $\frac{1}{4}$	801	3 $\frac{1}{4}$ x5	No. 92 $\frac{1}{4}$ Wrought Steel	.....

Complete with screws. One set in a box. Five dozen in a case.

No. 846, With Stop
No. 856, With 3 Bolts

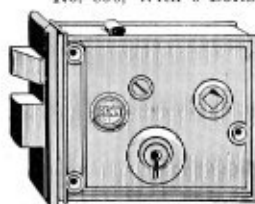


FIG. 5328

HORIZONTAL RIM KNOB LOCKS

REVERSIBLE

No. 865



FIG. 5328A

WITHOUT KNOBS

Set Number	Size Inches	Bolts	One Key	Changes	Without Knobs Per Dozen
846	3 $\frac{1}{4}$ x4 $\frac{1}{2}$	2 Brass Plat. Iron	Brass	12	.....
856	3 $\frac{1}{4}$ x4 $\frac{1}{2}$	3 Brass Plat. Iron	Brass	12	.....
853	4x5 $\frac{1}{2}$	3 Iron	Tinned Malleable Iron	12	.....
858	4x5 $\frac{1}{2}$	3 Brass Plat. Iron	Nickel Plated Steel	12	.....
859	4x5 $\frac{1}{2}$	3 Brass	Nickel Plated Steel	12	.....
865	3 $\frac{1}{4}$ x5	2 Iron	Nickel Plated Iron	6	.....

Complete with screws. Ten dozen in a case.

UPRIGHT RIM KNOB LOCKS REVERSIBLE

With Stop
Nos. 621 and 626



FIG. 5329

With Slide Bolt
Nos. 631 and 636



FIG. 5330

Number	Size, Inches	Bolts	One Key	Changes	Without Knobs Per Doz.
621	4x3 $\frac{1}{4}$	Iron	Tinned Malleable Iron	6	.....
626	4x3 $\frac{1}{4}$	Brass Plated Iron	Brass	6	.....
631	4x5 $\frac{1}{4}$	Iron	Tinned Malleable Iron	6	.....
636	4x3 $\frac{1}{4}$	Brass Plated Iron	Brass	6	.....

Complete with screws. Ten dozen in a case.

RIM LOCK SETS

Set Number	Lock	Size, Inches	With One Pair Knobs	Per Doz.
621x110	621	4x3 $\frac{1}{4}$	No. 110 Mineral	.....
621x210	621	4x3 $\frac{1}{4}$	No. 210 Porcelain	.....
621x310	621	4x3 $\frac{1}{4}$	No. 310 Jet	.....

Complete with screws. One set in a box. Five dozen in a case.

UPRIGHT RIM KNOB LOCKS REVERSIBLE

Nos. 751 to 759



FIG. 5331

Number	Size, Inches	Bolts	One Key	Changes	Without Knobs Per Doz.
751	5x3 $\frac{1}{2}$	Iron	Tinned Malleable Iron	12	.....
755	5x3 $\frac{1}{2}$	Brass Plated Iron	Nickel Plated Steel	12	.....
759	5x3 $\frac{1}{2}$	Brass	Brass	12	.....

Complete with screws. Ten dozen in a case.

HORIZONTAL RIM DEAD LOCKS **FOR STORE DOORS** **REVERSIBLE**

Nos. 194 and 194½



FIG. 5332

Number	Size Inches	Bolt	Two Keys	Steel Tumblers	Changes	Per Dozen
194	4x6	Heavy Iron	Nickel Plated Steel Folding	One	24	.....
194½	4x6	Heavy Iron	Nickel Plated Steel Folding	Three	50	.....

Complete with screws. One in a box.

UPRIGHT RIM DEAD LOCKS **FOR STORE DOORS** **REVERSIBLE**

Nos. 134 and 134½



FIG. 5333

Nos. 154 and 154½



FIG. 5334

Number	Size Inches	Bolt	Two Keys	Steel Tumblers	Changes	Per Dozen
134	4½x2½	Heavy Iron	Nickel Plated Steel Folding	One	24	.....
134½	4½x2½	Heavy Iron	Nickel Plated Steel Folding	Three	50	.....
154	5x3	Heavy Iron	Nickel Plated Steel Folding	One	24	.....
154½	5x3	Heavy Iron	Nickel Plated Steel Folding	Three	50	.....

Complete with screws. One in a box.

KEYS



FIG. 5335



FIG. 5336



FIG. 5337



FIG. 5338



FIG. 5339



FIG. 5340



FIG. 5341



FIG. 5342



FIG. 5343



FIG. 5344



FIG. 5345

Class Number	Material	For	Price
28	Tinned Malleable Iron	Locks—801, 811, 621, 631	Per doz.....
38	Tinned Malleable Iron	Lock —953	Per doz.....
34	Tinned Malleable Iron	Lock —751	Per doz.....
68	Brass	Locks—806, 816, 626, 636	Per doz.....
78	Brass	Locks—846, 856, 759	Per doz.....
54	Nickel-plated Iron	Lock —865	Per doz.....
250	Nickel-plated Steel	Lock —755	Per doz.....
258	Nickel-plated Steel	Locks—958, 959	Per doz.....
164	Nickel-plated Steel, Folding	Locks—134, 154, 194	Each.....
165	Nickel-plated Steel, Folding	Locks—134½, 154½, 194½	Each.....
140	Nickel-plated Steel, Flat	Latches—265, 267, 369	Per doz.....
142	Nickel-plated Steel, Flat	Latches—233, 233 DB, 233 AC	Per doz.....
506	German Silver	Latch 321	Each.....
510	German Silver	Latches—372, 372 AC	Each.....
506B	German Silver	Blank—Uncut	Each.....
510B	German Silver	Blank—Uncut	Each.....

BARREL BOLTS

No. 13

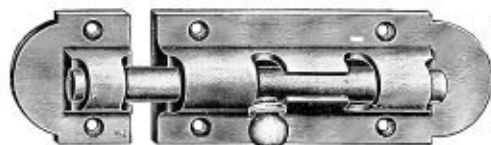


FIG. 5346

Brass Plated Malleable Iron Knobs

No.	In.	3	4	5	6	7	8	10
13	PrDz							

Without Screws. 1 Doz in a Box

No. 41



FIG. 5347

CHAIN BOLTS
CAST IRON-STEEL CHAIN

Number	Case, Bolt and Strike	Inch			Per Doz.
		4	6	8	
41	Japanned	.....	.....	.....	.....
8542J	Japanned	.....	.....	.....	.....
8542A	Amber	.....	.....	.....	.....
8542	Polished Plated	.....	.....	.....	.....
8542AC	" Ant. Copper	.....	.....	.....	.....
8542DB	" Dull Brass	.....	.....	.....	.....

One Dozen in a Box

Japanned without Screws — all others with Screws

No. 8342



FIG. 5348

No. 20



FIG. 5349

SPRING LEVER FOOT BOLTS

CAST IRON POLISHED BOLT

Number	Finish	Inch			Per Doz.
		4	6	8	
20	Japanned	.....	.....	.....	.....
8525J	Japanned	.....	.....	.....	.....
8525A	Amber	.....	.....	.....	.....
8525	Polished Plated	.....	.....	.....	.....
8525AC	" Ant. Copper	.....	.....	.....	.....
8525DB	" Dull Brass	.....	.....	.....	.....

One-half Dozen in a Box

Japanned without Screws—all others with Screws

No. 8525

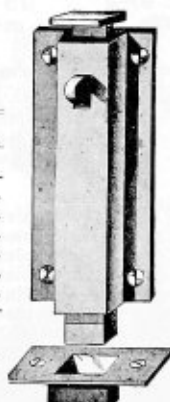


FIG. 5350

CUPBOARD TURNS

No. 8461A

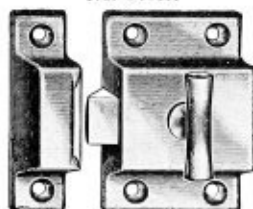


FIG. 5351

No. 8462A

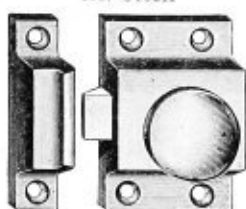


FIG. 5352

CAST IRON

Number	Size of Case	Case and Strike	Handle and Knob	Finish	Per Dozen
	Inch				
8461A	2 1/4 x 1 1/2	Cast Iron	T Handle Iron	Amber	.....
8461	2 1/4 x 1 1/2	Cast Iron	T Handle Iron	Natural Color Plated	.....
8461AC	2 1/4 x 1 1/2	Cast Iron	T Handle Iron	Antique Copper	.....
8461DB	2 1/4 x 1 1/2	Cast Iron	T Handle Iron	Dull Brass	.....
8462A	2 1/4 x 1 1/2	Cast Iron	Knob Iron	Amber	.....
8462	2 1/4 x 1 1/2	Cast Iron	Knob Iron	Natural Color Plated	.....
8462AC	2 1/4 x 1 1/2	Cast Iron	Knob Iron	Antique Copper	.....
8462DB	2 1/4 x 1 1/2	Cast Iron	Knob Iron	Dull Brass	.....

Complete with screws. One dozen in a box.

No. 9461A

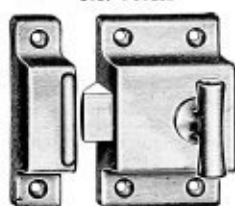


FIG. 5353

No. 9462A

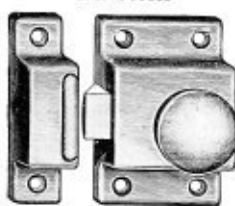


FIG. 5354

No. 9463A

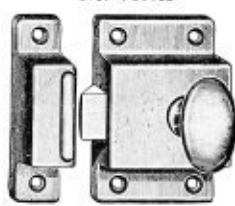


FIG. 5355

WROUGHT STEEL

Number			Size of Case Inch	Case and Strike	Finish	Per Dozen
T Handle	Round Knob	Oval Knob				
9461A	9462A	9463A	2 1/4 x 1 3/8	Wrought Steel	Amber	.....
9461T	9462T	9463T	2 1/4 x 1 3/8	Wrought Steel	Natural Color Plated	.....
9461TAC	9462TAC	9463TAC	2 1/4 x 1 3/8	Wrought Steel	Antique Copper	.....
9461TDB	9462TDB	9463TDB	2 1/4 x 1 3/8	Wrought Steel	Dull Brass	.....

Complete with screws. One dozen in a box.

SASH LIFTS

HOOK SASH LIFT



FIG. 5356

Number	Inch	Wrought Steel	Per Gross
		Finish	
957A	1 1/2 x 1 3/4	Amber	.....
957T	1 1/2 x 1 3/4	Unpolished Plated	.....
957TAC	1 1/2 x 1 3/4	" Ant. Copper	.....
957TDB	1 1/2 x 1 3/4	" Dull Brass	.....

Complete with Screws

Quarter Gross in a Box



FIG. 5357

FLUSH SASH LIFTS

Number	Inch	Wrought Steel	Per Doz.
		Finish	
DB955A	1 5/8 x 3 1/4	Amber	.....
DB955T	1 5/8 x 3 1/4	Unpolished Plated	.....
DB955TAC	1 5/8 x 3 1/4	" Ant. Copper	.....
DB955TDB	1 5/8 x 3 1/4	" Dull Brass	.....

Complete with Screws

One Dozen in a Box



FIG. 5358

BAR SASH LIFTS

Number	Inch	Cast Iron	Per Doz.
		Finish	
853A	1 3/8 x 5	Amber	.....
853T	1 3/8 x 5	Unpol'd Plated	.....
853TAC	1 3/8 x 5	" Ant. Copper	.....
853TDB	1 3/8 x 5	" Dull Brass	.....

Complete with Screws. One Doz. in Box

SASH FASTENERS

FITCH STYLE



FIG. 5359

Number	Inch	Cast Iron	Per Gross
		Finish	
878CD	7/8 x 2 1/2	Coppered	.....
878A	7/8 x 2 1/2	Amber	.....
878T	7/8 x 2 1/2	Unpolished Plated	.....
878TAC	7/8 x 2 1/2	" Ant. Copper	.....
878TDB	7/8 x 2 1/2	" Dull Brass	.....

Complete with Screws

One Dozen in a Box

HAT AND COAT HOOKS

WIRE HAT AND COAT HOOKS

No. 60

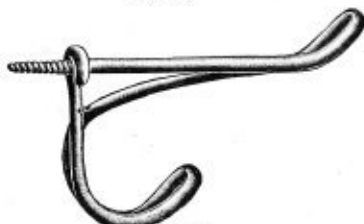


FIG. 5360

Size, In.	Weight Per gross about lbs.	Japanned Steel		Coppered Steel Wire		Nickel Plated Steel Wire	
		No.	Per Gross	No.	Per Gross	No.	Per Gross
2 1/2	6	60	...	160	...	...	...
3	9	70	...	170	...	170N	...
3 1/2	11	80	...	180	...	...	...

One-half Gross in a Box. 12 Gross in a Case

CAST IRON HAT AND COAT HOOKS

No. 853 J



FIG. 5361

Number	Projection	Finish	Per Gross
853J	3 1/4 Inch	Jap'd without Screws	.....
853A	3 1/4 Inch	Amber with Screws	.....
853T	3 1/4 Inch	Nat. Color Plated "	.....
853TAC	3 1/4 Inch	Antique Copper "	.....
853TDB	3 1/4 Inch	Dull Brass "	.....

One-quarter Gross in a Box

CAST IRON HAT AND COAT HOOKS

No. 854 J



FIG. 5362

Number	Projection	Finish	Per Gross
854J	3 3/8 Inch	Jap'd without Screws	.....
854A	3 3/8 Inch	Amber with Screws	.....
854T	3 3/8 Inch	Nat. Color Plated "	.....
854TAC	3 3/8 Inch	Antique Copper "	.....
854TDB	3 3/8 Inch	Dull Brass "	.....

One-quarter Gross in a Box

YALE DRAWER AND CHEST LOCKS

CUTS ONE-HALF SIZE

No. 955



FIG. 5363

No. 955. Size $1\frac{1}{4} \times 1\frac{1}{2}$ inches; brass; solid screwed cap; broad heavy bolt; brass-buffed nose; 2 lever-tumblers; 2 nickel-plated flat steel keys, 12 changes. For $\frac{7}{8}$ -inch wood.....per dozen \$11.08

Packed one dozen in a box with strikes.

No. 5618

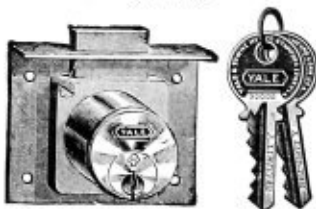


FIG. 5364

No. 5618. Size $1\frac{1}{8} \times 2\frac{1}{4}$ inches; all brass; solid screwed box; broad heavy bolt; square selvedge; 1-inch drop; 2 paracentric keys, changes practically unlimited. For $\frac{3}{4}$ -inch wood.....per dozen \$39.72

Packed each in a box.

No. R300

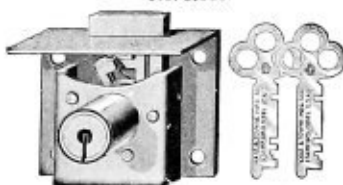


FIG. 5365

Size $1\frac{1}{8} \times 2$ inches; material as below; broad heavy brass bolt; square selvedge; $\frac{7}{8}$ -inch drop; 2 lever-tumblers; 2 nickel-plated flat steel keys, 12 changes. For $\frac{7}{8}$ -inch wood:

No.	Material	Per Dozen
R 300	Iron	\$ 8.40
RA 300	Brass	10.04

Packed one dozen in a box.

No. S86

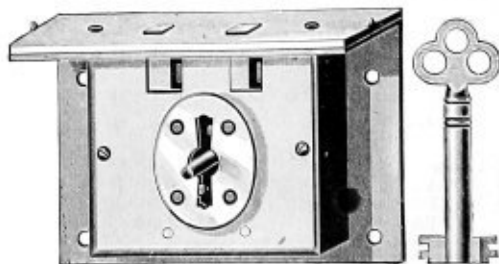


FIG. 5366

No. S86. Size $2\frac{3}{4} \times 4$ in.; solid iron screwed cap; iron double link, self-locking, iron plate; brass escutcheon; square selvedge; secret wards; 4 hooks; $1\frac{3}{8}$ -in. drop; 1 flat boy, malleable iron double bitted key, 12 changes.....per dozen \$14.30

Packed half-dozen in box, with escutcheons.

COMBINATION CHEST LOCKS

CUT FULL SIZE

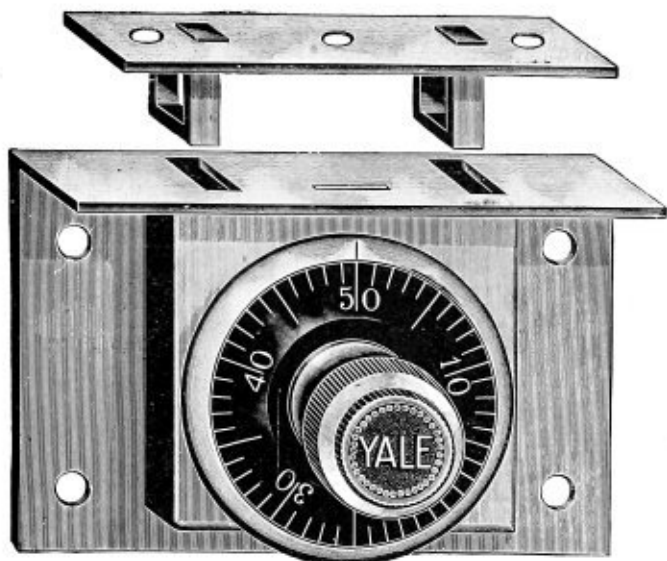


FIG. 5367

NO. 0326 SERIES

MATERIAL—All steel, brass plated, except links and dial.

BOX—Solid, square.

LINK—Brass, double.

SELVEDGE—Square, polished.

DIAL—1½ in. diameter. Brass, black enameled, with white numerals; brass knob and ring. May be furnished all nickel plated to special order and at an additional price.

DROP—Distance from edge of selvedge to center of dial, 1¼ in.

COMBINATION—May be changed without removing lock.

FOR MATERIAL—From ½ in. to 2 in., with ⅜ in. adjustability. Specify thickness wanted when ordering, and whether for wood or metal.

OPERATION—In spring bolt locks, the links catch automatically, when cover is closed, and to open again the dial must be turned.

Dead bolt locks permit of closing and opening cover as many times as desired, until the dial is turned twice to lock.

With Dead Bolt					With Spring Bolt: Self-Locking				
No.	Size	Tumblers	Changes	List Price per doz.	No.	Size	Tumblers	Changes	List Price per doz.
0326	2 ½ x 3 ¾ in.	3	500	\$49.55	0326S	2 ½ x 3 ¾ in.	3	500	\$50.95
0336	2 ½ x 3 ¾ in.	4	11000	50.70	0336S	2 ½ x 3 ¾ in.	4	11000	52.10

Packed each in a box, with screws and directions for operating and changing combination.

COMBINATION DRAWER LOCKS

CUTS FULL SIZE

Nos. 0200 and 0210

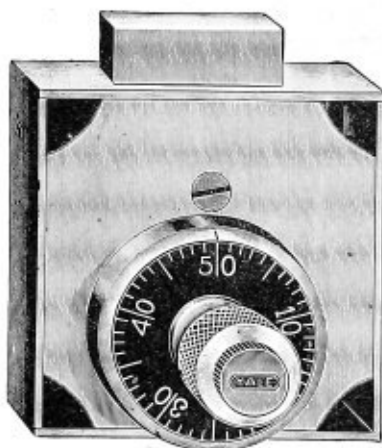


FIG. 5368

Nos. 0300 and 0310

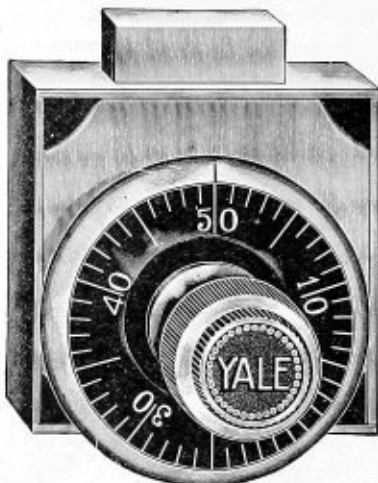


FIG. 5369

NO. 0200 SERIES

MATERIAL—All brass.

BOLT—Dead bolt lock, laminated steel and brass combined.

Spring bolt lock, brass; $\frac{5}{8}$ in. throw.

DIAL—Brass, black enameled, with white numerals; brass knob and ring. May be furnished all nickel plated to special order and at an additional price.

DROP—Distance from edge of lock to center of dial, $1\frac{1}{2}$ in.

COMBINATION—May be changed without removing lock.

FOR MATERIAL—From $\frac{1}{8}$ in. to 2 in., with $\frac{3}{8}$ in. adjustability. Specify thickness wanted and whether for wood or metal.

WITH 1 5-16 INCH DIAL

With Dead Bolt					With Spring Bolt				
No.	Size	Tumblers	Changes	List Price Per Doz.	No.	Size	Tumblers	Changes	List Price Per Doz.
0200	2x2 in.	3	500	\$31.15	0200S	2x2 in.	3	500	\$36.35
0210	2x2 in.	4	11000	32.30	0210S	2x2 in.	4	11000	37.50

WITH 1 1/4 INCH DIAL

0300	2x2 in.	3	500	\$33.95	0300S	2x2 in.	3	500	\$39.15
0310	2x2 in.	4	11000	35.15	0310S	2x2 in.	4	11000	40.35

Packed each in a box, with screws and directions for operating and changing combination.

COMBINATION CASH BOX LOCKS

CUT FULL SIZE

Nos. 0376 and 0386

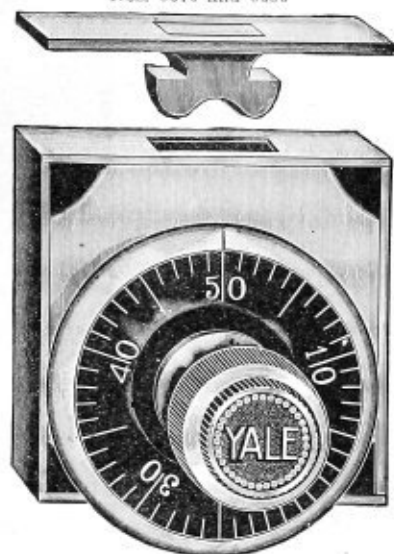


FIG. 5370

NO. 0276 SERIES

MATERIAL—All brass.

LINK—Double.

DIAL—Brass, black enameled, with white numerals; brass knob and ring. May be furnished all nickel plated to special order and at an additional price.

DROP—Distance from edge of seldedge to center of dial, $1\frac{1}{2}$ in.

COMBINATION—May be changed without removing lock.

FOR MATERIAL—From $\frac{1}{8}$ in. to 2 in., with $\frac{3}{8}$ in. adjustability. Specify thickness wanted and whether for wood or metal.

OPERATION—In spring bolt locks, the links catch automatically when cover is closed, and to open again the dial must be turned. Dead bolt locks do not catch until dial is turned.

WITH 1 5-16 INCH DIAL

With Dead Bolt					With Spring Bolt: Self-Locking				
No.	Size	Tumblers	Changes	List Price Per Dos.	No.	Size	Tumblers	Changes	List Price Per Dos.
0276	2x2 in.	3	500	\$32.55	0276S	2x2 in.	3	500	\$33.95
0286	2x2 in.	4	11000	33.75	0286S	2x2 in.	4	11000	35.15
WITH 1 7-8 INCH DIAL									
0376	2x2 in.	3	500	\$35.40	0376S	2x2 in.	3	500	\$36.80
0386	2x2 in.	4	11000	36.55	0386S	2x2 in.	4	11000	38.00

Packed each in a box, with screws and directions for operating and changing combination.

YALE PADLOCKS
CUTS ONE-HALF SIZE

No. 745V

No. 534J



FIG. 5371

YALE "DEFENDER" PADLOCKS

No. 745V. 2 inch; wrought brass, dipped bright case; steel, nickel-plated shackle; 4 pin-tumblers; 2 nickel-plated corrugated nickel-bronze keys, 144 changes.....per dozen \$25.80

No. 745½V. Furnished with 9 inches of sash chain, otherwise same as above.....per dozen \$28.80

Master-keyed.

No. 745VMK. 2 inch; wrought brass, dipped bright case; steel, nickel-plated shackle; 4 pin-tumblers; 2 nickel-plated corrugated nickel-bronze keys.....per dozen \$31.75

No. 19575



FIG. 5373

YALE "LEVER-TUMBLER" PADLOCKS

No. 19575. 2 inch; wrought bronze case, dipped bright and lacquered; cast bronze shackle, wheel finish; 6 lever-tumblers; 2 malleable iron barrel keys, nickel plated, 144 changes.....dozen \$15.70

No. 19575½. Furnished with 9 inches of "Triumph" chain, otherwise same as above.....per dozen \$19.70

Master-keyed.

No. 19575MK. Same as No. 19575.....per dozen \$19.65

All above are packed ½ dozen in a box.



FIG. 5372

YALE "INTREPID" PADLOCKS

No. 534J. 1½ inch; steel, japanned case; steel brass-plated shackle; 4 lever-tumblers; 2 nickel-plated flat steel keys, 12 changes.....per dozen \$10.50

No. 534½J. Furnished with 9 inches of sash chain, otherwise same as above Per dozen.....12.90

Master-keyed.

No. 534JMK. 1½ inch; steel, japanned case; steel brass-plated shackle; 4 lever-tumblers; 2 nickel-plated flat keys, 4000 changes....per dozen \$14.45

No. 692J



FIG. 5374

YALE "WROUGHT-STEEL" PADLOCKS

No. 692J. 1½ inch; steel, japanned case; steel, nickel-plated shackle; 3 lever-tumblers; 2 nickel-plated flat steel keys, 12 changes.....per dozen \$5.35

Master-keyed.

No. 692JMK. 1½ inch; steel, japanned; steel nickel-plated shackle; 3 lever-tumblers; 2 nickel-plated flat steel keys, 3000 changes....per dozen \$10.65

YALE PADLOCKS—CONTINUED

CUTS ONE-HALF SIZE

No. 853



FIG. 5375

YALE "STANDARD" PADLOCKS

Cast bronze case and shackle; 4 lever-tumblers; 2 fluted keys, changes as below.

No.	Size	Changes	Dozen
813	1 in.	48	\$20.00
823	1 1/4 in.	48	22.00
833	1 1/2 in.	48	25.00
843	1 3/4 in.	72	28.05
853	2 in.	144	31.00
863	2 1/4 in.	144	38.50
873	2 1/2 in.	144	54.60

Packed 1/2 dozen in a box.

No. 805F



FIG. 5377

YALE "IRONSIDES" PADLOCKS

No. 805F. 2 inch; cast iron, bower barred case; bronze buffed shackle; 4 lever-tumblers; 2 nickel-plated flat steel keys, 144 changes.....per dozen \$17.90

No. 805 1/2 F. Furnished with 9 inches of sash chain, otherwise same as above.....per dozen \$20.90

Packed 1/2 dozen in a box.

No. 840



FIG. 5376

YALE "PIN-TUMBLER" PADLOCKS

No. 840. 1 1/4 inch; cast bronze case; steel shackle; 5 pin-tumblers; 2 paracentric keys, changes practically unlimited.....per dozen \$35.75

No. 840 1/2. Furnished with 9 inches of 7B chain, otherwise same as above.....per dozen \$38.75

Master-keyed.

No. 840MK. 1 1/4 inch; cast bronze case; steel shackle; 6 pin-tumblers; 2 paracentric keys. Any number of these padlocks up to 4,000 can be furnished with keys all different and all controlled by one master key.....per dozen \$41.75

Packed each in a box.

No. 8454



FIG. 5378

YALE "MONITOR" PADLOCKS

No. 8454. 2 inch; steel, bower barred case and shackle; 4 lever-tumblers; 2 nickel-plated corrugated steel keys, 144 changes.....per dozen \$20.85

No. 8454 1/2. Furnished with 9 inches of sash chain, otherwise same as above.....per dozen \$23.85

Packed each in a box.



CORBIN PADLOCKS CUTS ONE-HALF SIZE

No. 2880



FIG. 5380

With Corbin Ball Bearing, Pin-tumbler Cylinder.

Made from solid block of extruded brass metal, bored out to receive mechanism. Finely finished. No two locks alike. Changes unlimited; 2 German silver gold-plated bow keys with each lock. Can be furnished alike or all different, and master-keyed in sets, if desired. Also with 9-inch chain.

Price per
dozen

No. 2879. 1 x 1 1/8 inch.....\$.....

No. 2880. 1 3/8 x 1 3/8 inch.....

No. 2881. 1 1/2 x 1 1/2 inch.....

No. 2882. 1 3/4 x 1 1/2 inch.....

No. 2883. 2 x 1 1/2 inch.....

No. 990



FIG. 5381

With Corbin Ball Bearing, Pin-tumbler Cylinder.

Heavy case. Self-locking, cast bronze coined shackle. Bronze mechanism; 2 flat steel keys to each lock. No two locks alike. Number of changes unlimited.

No. 9889. 1 1/2 inch, Iron Case, Rustless finish.....price per doz. \$.....

No. 9889C. 1 1/2 inch, same, with 9-inch steel chain.....price per doz.

No. 990. 2 inch, Iron Case, Rustless finish.....price per doz.

No. 990C. 2 inch, same, with 9-inch steel chain.....price per doz.

No. 2967



FIG. 5382

2 inch. Seamless drawn steel case, rustless finish. Drop-forged steel spring shackle; 4 secure levers; 2 nickel-plated steel keys to each lock. Bronze mechanism. Made regularly with 144 changes.

No. 2967. Steel.....price per doz. \$.....

No. 2967C. Steel, 9-inch galvanized steel chain.....price per doz.

No. 9865



FIG. 5383

Seamless drawn steel case. Wrought steel nickel-plated spring shackle; 3 secure levers; 2 nickel-plated flat steel keys to each lock. Made regularly with 48 changes.

No. 9863. 1 1/2 inch.....price per doz. \$.....

No. 9863C. 1 1/2 inch, 9-inch nickel-plated steel chain.....price per doz.

No. 9865. 2 inch.....price per doz.

No. 9865C. 2 inch, 9-inch nickel-plated steel chain.....price per doz.

No. 0995



FIG. 5384

No. 02861 1/2



FIG. 5385



FIG. 5386

No. 0995 and 0995C
Cast

FIG. 5387

CORBIN PADLOCKS—

CONTINUED

CUTS ONE-HALF SIZE

2 1/4 inch. Gun metal, polished. Heavy spring shackle; 6 secure levers; 2 nickel-plated flat steel keys to each lock; 3,000 changes possible. Can be furnished alike or all different and master-keyed in sets, if desired.

No. 0995. Gun metal...price per doz. \$.....

No. 0995C. Gun metal, 9-inch steel chainprice per doz.

Cast bronze, polished. Heavy bronze spring shackle; 3 wards; 2 levers. Phosphor bronze springs; 2 nickel plated flat steel keys to each lock. All different in a dozen.

No. 02861 1/2. 1 3/4 in...price per doz. \$.....

No. 02865 1/2. 2 1/4 in...price per doz.

Cast brass case. Heavy wrought steel nickel-plated spring swivel shackle; 2 nickel-plated flat steel keys to each lock, all different in a dozen.

No. 09827. 1 1/4 inch.....price per doz. \$.....

No. 09828. 1 3/8 inch.....price per doz.

No. 02829. 2 1/8 inch.....price per doz.

No. 02830. 2 1/2 inch.....price per doz.

Champion—2 1/4 inch. Heavy spring shackle; 6 secure levers; 2 nickel-plated flat steel keys to each lock, all different in a dozen; 3,000 changes possible, or 1,000 changes with master key. Key blank No. 5537.

No. 0995. Gun metal, polished.....price per doz. \$.....

No. 0995C. Gun metal, polished, with 9-inch steel chain No. 7.....price per doz.

CORBIN PADLOCKS—CONTINUED CUTS ONE-HALF SIZE

No. 1968C

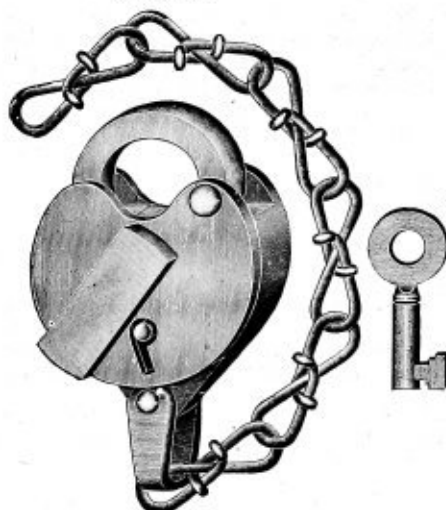


FIG. 5388

RAILWAY SWITCH LOCKS

Cast bronze, polished. Heavy spring shackle; 2 tumblers; 9-inch black japanned chain. Polished bronze key.

No. 1968C. 2½ inch.

.....price per doz. \$.....

No. 960C

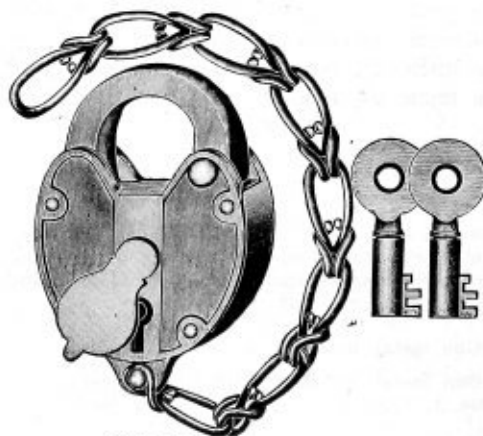


FIG. 5389

2½ inch. Polished spring shackle. Bronze drop; 4 secure levers; 2 polished bronze keys to each lock. Made regularly with 36 changes; 9-inch steel chain.

No. 960C. Malleable Iron, red enamel.....

.....price per doz. \$.....

No. 0960C. Cast Bronze.

.....price per doz. \$.....

CORBIN PADLOCKS—CONTINUED

CUTS ONE-HALF SIZE

No. 915¼ GC



FIG. 5390

2 inch. Heavy cast spring shackle;
6 secure levers. Interior mechanism
brass; 2 double-bitted nickel-plated
steel keys to each lock, all different in
a dozen.



No. 915¼ G. Steel, galvanized
finishprice per doz. \$.....

No. 915¼ GC. Same, 9-in. galv'd
chainprice per doz.

No. 09835



FIG. 5391



2¾ inch. Heavy wrought steel, copper-
plated spring shackle; 2 nickel-plated flat
steel keys to each lock, made in 6 changes.

No. 09835 Cast Brass.....
.....price per doz. \$.....

No. 09835C. Cast Brass, 9-in. steel
chainprice per doz.



No. 926¼



FIG. 5392



2 inch. Malleable iron spring shackle; 6
secure levers; 2 double-bitted flat steel keys
to each lock, all different in a dozen.

No. 926¼. Steel, brass plated.....
.....price per doz. \$.....

No. 926¼C. Same, 9-in. steel chain..
.....price per doz.

CORBIN PADLOCKS—CONTINUED CUTS ONE-HALF SIZE

No. 9925E



FIG. 5393

No. 2822 3/4



FIG. 5394

No. 9831 1/4 G



FIG. 5395

No. 2955 1/4



FIG. 5396

2 inch. nickel-plated malleable iron spring shackle; 6 secure levers; 2 double-bitted brass-plated malleable iron keys to each lock, all different in a dozen.

No. 9925E. Steel, black japanned...
.....price per doz. \$.....

2 inch. Malleable iron spring shackle. Secure levers and wards. Superior construction, locking shackle both heel and toe; 2 nickel-plated flat steel keys to each lock, all different in a dozen.

No. 2822 3/4. Steel, brass plated.....
.....price per doz. \$.....
No. 2822 3/4 C. Same, 9-in. steel chain...
.....price per doz.

Malleable iron spring shackle; 2 nickel-plated steel keys to each lock; 6 changes in a dozen; 1 3/4 inch.

No. 9831 1/4 G. Steel, galvanized finish.....
.....price per doz. \$.....
No. 9832 1/4 G. 2 in., steel, galv'd finish...
.....price per doz.

Nickel-plated malleable iron spring shackle. Secure levers and wards. Superior construction, locking shackle both heel and toe (in 4 largest sizes); 2 nickel-plated flat steel keys to each lock, all different in a dozen.

**Price
per
doz.**

No. 2953 1/4. 1 1/8 in., steel, black japanned..\$.....
No. 2954 1/4. 1 1/2 in., steel, black japanned.. ..
No. 2955 1/4. 1 3/4 in., steel, black japanned.. ..
No. 2956 1/4. 2 in., steel, black japanned.. ..
No. 2957 1/4. 2 1/4 in., steel, black japanned.. ..
No. 2958 1/4. 2 1/2 in., steel, black japanned.. ..

YALE DOOR CLOSERS

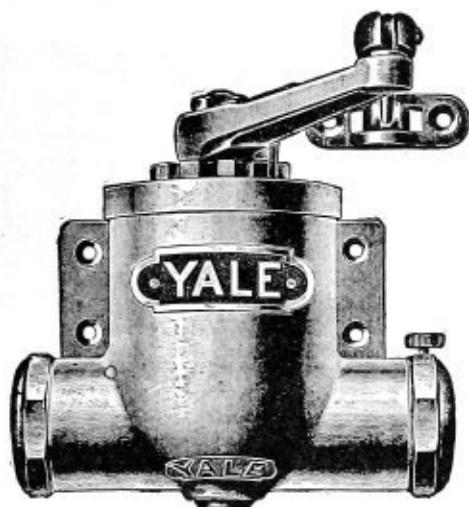


FIG. 5397

In selecting the closer to be used be sure that it is of ample size. If too small for the door it will not be effective in control, and is liable to be broken.

For doors exposed to severe drafts, use a closer one size larger than called for in the table below. Doors with metal frames or heavy glass panels, require heavier closers than ordinary doors of equal size.

The sizes here given are for standard doors.

WITHOUT HOLDER DEVICE

No. 11.	For screen and other light doors.....	each	\$4.60
No. 12.	For light inside doors not exceeding 7 feet high by 2½ feet wide.....	each	6.00
No. 13.	For inside doors of medium size not exceeding 7 feet high by 3 feet wide	each	7.10
No. 14.	For heavy inside and ordinary outside doors not exceeding 7½ by 3 feet	each	8.50
No. 15.	For heavy outside doors 8½ feet high by 4 feet wide.....	each	11.35

Closers are furnished regularly in gold bronze finish.

NARROW WROUGHT STEEL BUTTS

Nos. 700 and 1700

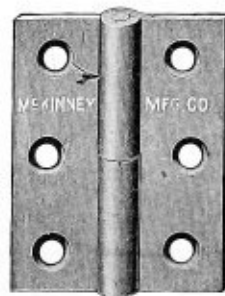
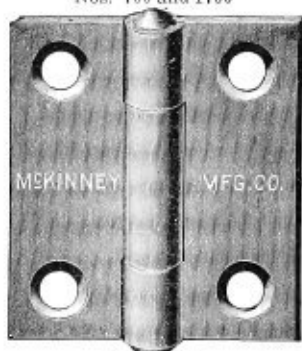
Nos. 701, 2701 and 3701
Loose Joint Butt

FIG. 5398

FIG. 5399

NARROW WROUGHT STEEL BUTTS

No.	700	1700						
Size	Bright Steel	Japanned	Size of	No. of	No. of	Doz. Prs.	Avg. Net	
Inches	Per Doz. Pairs Without Screws	Per Doz. Pairs With Screws	Screws	Screws to Each Butt	Butts in a Box Br't St'l Doz. Prs.	in a Standard Case Br't St'l	Wt. of Standard Cases Br't St'l Lbs.	
1	\$ 0.40	\$0.40	5	4	1	100	62	
1 1/4	.50	.45	6	4	1	100	97	
1 1/2	.65	.55	6	4	1	100	124	
1 3/4	.80	.65	7	4	1	100	176	
2	.90	.70	8	4	1	100	210	
2 1/4	1.05	.80	8	6	1	100	254	
2 1/2	1.10	.90	8	6	1	100	310	
2 3/4	1.30	....	9	6	1	50	191	
3	1.45	1.10	9	6	1	50	221	
3 1/4	1.70	....	9	6	1	50	271	
3 1/2	2.00	1.40	10	6	1	40	280	
3 3/4	2.70	....	10	6	1	40	336	
4	2.85	2.00	10	8	1 1/2	25	239	
4 1/2	3.70	2.60	11	8	1 1/2	20	248	
5	4.60	3.10	12	8	1 1/2	15	230	
5 1/2	6.00	....	13	8	1 1/2	15	288	
6	7.10	....	13	8	1 1/2	15	356	
7	11.50	....	14	8	1 1/2			
8	19.00	....	14	8	1 1/2			

NARROW WROUGHT STEEL LOOSE JOINT BUTTS

No.	701	2701	3701					
Size	Br't St'l	Polished and	Polished and	Size of	No. of	No. of	Doz. Prs.	
Open	Per Doz. Pairs Without Screws	Bronzed Per Doz. Pairs With Screws	Bronzed Per Doz. Pairs With Screws	Screws	Screws to Each Butt	Butts in a Box Doz. Prs.	in a Standard Case Br't St'l	
Inches				No.				
2 x 1 1/2	\$1.40	\$2.00	\$ 5.15	8	4	1	100	
2 1/4 x 1 1/4	1.55	2.25	5.55	8	6	1	100	
2 1/2 x 1 1/2	1.70	2.50	5.90	8	6	1	100	
2 3/4 x 2	2.00	2.90	6.40	9	6	1	50	
3 x 2 1/4	2.10	3.20	7.20	9	6	1	50	
3 1/2 x 2 1/2	3.20	4.65	9.00	10	6	1 1/2	...	
4 x 3	3.90	5.60	10.40	10	8	1 1/2	...	

REVERSIBLE WROUGHT STEEL LOOSE PIN BUTTS

Nos. 703 and 1703

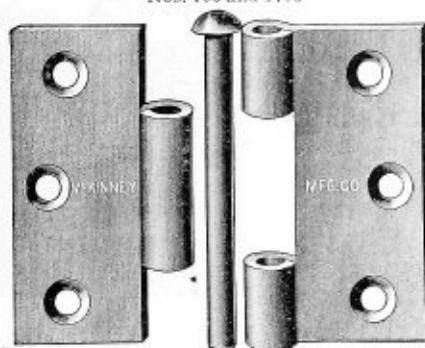


FIG. 5400

Nos. 717 and 1717

Light Style



FIG. 5401

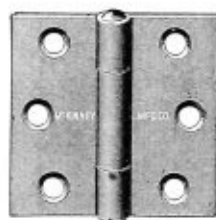
REVERSIBLE LOOSE PIN BUTTS

No.	703	1703						Avg. Net
	Br't St'l	Japanned						Wt. of
	Per Doz.	Per Doz.						Standard
	Pairs	Pairs	Size of	No. of	No. of	Doz. Prs.	Br't St'l	Cases
	Without	With	Screws	to Each	Butts in	in Stand-		Lbs.
	Screws	Screws	No.	Butt	a Box	ard Case		
Size					Doz. Prs.			
Open								
Inches								
2 x 2	\$ 1.40	\$ 1.60	7	4	1	50		152
2 x 2½	1.50	1.70	7	4	1	50		191
2½ x 2	1.60	1.80	8	6	1	50		208
2½ x 2½	1.80	2.00	8	6	1	50		241
2½ x 3	2.20	2.40	8	6	1	50		286
3 x 2½	2.40	2.60	9	6	1	40		248
3 x 3	2.60	2.85	9	6	1	40		292
3 x 3½	3.00	3.25	9	6	1½	25		207
3½ x 3	3.60	3.85	10	6	½	25		244
3½ x 3½	3.80	4.00	10	6	½	25		278
3½ x 4	4.30	4.60	10	6	½	25		313
4 x 3½	4.60	5.00	10	8	½	25		335
4 x 4	4.70	5.10	10	8	½	20		302
4 x 4½	4.80	5.20	10	8	½	20		330
4½ x 4	5.30	5.80	11	8	½	20		358
4½ x 4½	5.90	6.40	11	8	½	10		193
5 x 5	7.70	8.30	12	8	½	10		266
5½ x 5½	9.60	10.20	13	8	¾	10		350
6 x 6	11.40	12.00	13	8	¾	10		202

LIGHT REVERSIBLE LOOSE PIN BUTTS

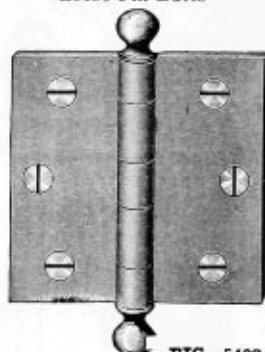
No.	717	1717						Avg. Net
	Br't St'l	Japanned						Wt. of
	Per Doz.	Per Doz.						Standard
	Pairs	Pairs	Size of	No. of	No. of	Doz. Prs.	Br't St'l	Cases
	Without	With	Screws	in Each	Butts in	in Stand-		Lbs.
	Screws	Screws	No.	Butt	a Box	ard Case		
					Doz. Prs.			
Size								
Open								
Inches								
2 x 2	\$ 1.40	\$1.00	7	4	1	50		108
2 x 2½	1.50	1.05	7	4	1	50		132
2 x 3	1.70	1.20	7	4	1	50		154
2½ x 2	1.60	1.10	7	6	1	50		133
2½ x 2½	1.80	1.20	7	6	1	50		164
2½ x 3	2.20	1.35	7	6	1	50		190
3 x 2½	2.40	1.50	8	6	1	50		225
3 x 3	2.60	1.60	8	6	1	50		323

Nos. 714 and 1714—Ball Tip
Loose Pin Butts



No. 705 and 1705
Broad Butte

WROUGHT STEEL BUTTS



BROAD BUTTS

No.	705	1705	1705 DB				FIG. 5403
Size Open Inches	Bright Steel Per Doz. Pres. Without Screws	Japanned Per Doz. Pres. With Screws	Japanned Dead Black Per Doz. Pres. With Screws	Size of Screws No.	Number of Screws to Each Butt	Doz. Pres. in Standard Case Bright Steel	Average Net Weight of Standard Cases Bright Steel, Lbs.
2 x 2	\$ 1.20	\$0.95	\$1.40	7	4	50	152
2 x 2½	1.25	...	...	7	4	50	191
2½ x 2	1.40	...	...	8	6	50	212
2½ x 2½	1.60	1.20	1.90	8	6	50	241
2½ x 3	1.90	...	...	8	6	50	282
3 x 2½	2.05	1.50	2.10	9	6	40	252
3 x 3	2.40	1.75	2.40	9	6	40	286
3 x 3½	2.70	...	...	9	6	25	205
3½ x 3	3.20	...	...	10	6	25	244
3½ x 3½	3.50	2.50	3.10	10	6	25	288
3½ x 4	4.00	...	...	10	6	25	310
4 x 4	4.30	3.10	3.85	10	8	20	302
4½ x 4½	5.60	4.00	4.75	11	8	20	387
5 x 5	6.90	4.90	6.00	12	8	10	266
5½ x 5½	9.00	6.30	8.00	13	8	10	350
6 x 6	10.20	7.20	9.75	13	8	10	404

3 x 3½ and smaller, one dozen pairs in a box.
3½ x 3 to 5x5, inclusive, one-half dozen pairs in a box.
5½ x 5½ and 6x6, one-quarter dozen pairs in a box.

BALL TIP LOOSE PIN BUTTS

No.	714	1714	714 & 1714	714	714	1714	1714	1714
	Bright Steel Per Doz. Pcs. Without Screws	Jaranned Per Doz. Pcs. Without Screws	Size of Screws Each Butt	Number of Butts in a Box	Dozen Pairs in Standards	Average Net Weight of Steel of Standard Cases	Number of Butts in a Box Dor.	Dozen Pairs in Standards
Open			No.	Pairs	Case	Lbs.	Pairs	Case
2 x2	\$ 4.25	\$1.70	7	4	50	178	$\frac{1}{2}$	25
2½x2	4.85	1.90	8	6	50	248	$\frac{1}{2}$	25
2½x2½	5.10	2.00	8	6	50	248	$\frac{1}{2}$	25
3 x2½	5.40	2.10	9	6	25	179	$\frac{1}{2}$	25
3 x3	5.50	2.15	9	6	25	205	$\frac{1}{2}$	20
3½x3	5.75	2.25	10	6	25	275	$\frac{1}{2}$	20
3½x3½	5.90	2.40	10	6	25	307	$\frac{1}{2}$	15
4 x3½	7.00	2.75	10	8	15	225	$\frac{1}{2}$	15
4 x4	7.30	2.90	10	8	12	197	$\frac{1}{2}$	12
4½x4	9.40	3.75	11	8	10	208	$\frac{1}{2}$	12
4½x4½	10.00	4.00	11	8	10	214	$\frac{1}{2}$	10
5 x5	13.75	5.50	12	8	10	324	$\frac{1}{2}$	8
5½x5½	19.50	7.60	13	8	10	372	$\frac{1}{2}$	8
6 x6	23.50	9.20	13	8	10	444	$\frac{1}{2}$	8

WROUGHT STEEL T HINGES

No. 805—Light

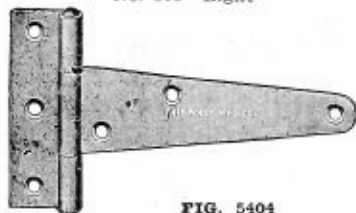


FIG. 5404

No. 807—Heavy



FIG. 5405

NO. 805. LIGHT T HINGES

Size Inches	Bright Steel Per Doz. Pcs. Without Screws	Size of Screws No.	Number of Screws to Each Hinge	Avg. No. of Doz. Pcs. in Standard Barrel Bright Steel	Avg. Wt. Per Doz. Pcs. Bright Steel, Lbs.	Avg. Net Wt. of Stand- ard Barrel Bright Steel, Lbs.
2	\$0.75	6	6	183	23½	530
4	1.80	7	6	150	3¼	510
5	1.00	8	7	115	5¼	640
6	1.20	8	7	101	6½	660
7	1.35	9	7	53	10¾	570
8	1.50	9	7	59	11½	650
9	1.90	10	8	33	16	625
10	2.20	10	8	39	16¾	646
12	3.00	11	8	23	22¾	510
14	3.90	12	9	16	34½	575
16	5.15	12	9	14	41	575

NO. 807. HEAVY T HINGES

Size Inches	Bright Steel Per Doz. Pcs. Without Screws	Size of Screws No.	Number of Screws to Each Hinge	Avg. No. of Doz. Pcs. in Standard Barrel Bright Steel	Avg. Wt. Per Doz. Pcs. Bright Steel, Lbs.	Avg. Net Wt. of Stand- ard Barrel Bright Steel, Lbs.
4	\$0.90	8	6	110	4¾	520
5	1.05	8	7	100	6¾	655
6	1.25	9	7	72	9¼	680
8	1.55	10	7	55	12¼	670
10	2.30	11	8	33	19½	630
12	3.20	12	8	18	32½	585
14	4.45	13	9	11	40	435
16	5.40	14	9	...	...	...
18	5.75	...	...	...	...	...

No. 809—Extra Heavy

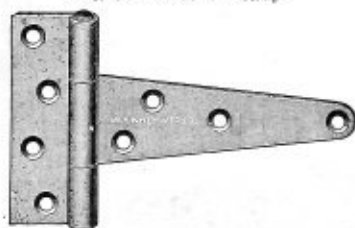


FIG. 5406

No. 810—Corrugated, Extra Heavy

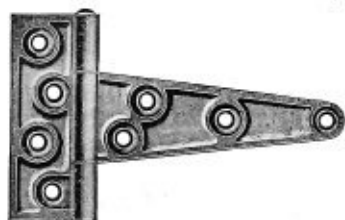


FIG. 5407

NO. 809. EXTRA HEAVY T HINGES

Size Inches	Bright Steel Per Doz. Pcs. Without Screws	Size of Screws No.	Number of Screws to Each Hinge	Avg. No. of Doz. Pcs. in Standard Barrel Bright Steel	Avg. Wt. Per Doz. Pcs. Bright Steel, Lbs.	Avg. Net Wt. of Stand- ard Barrel Bright Steel, Lbs.
4	\$1.80	9	6	81	8	670
5	2.45	10	8	65	11¼	750
6	3.00	11	8	35	20¾	720
8	5.00	13	8	21	34¾	726
10	7.40	14	9	12	55	665
12	10.70	14	10	8	77¾	630
14	11.80	16	10	7¼	83	600
16	12.60	16	10	6½	88	569

NO. 810. CORRUGATED EXTRA HEAVY T HINGES

Size Inches	Bright Steel Per Doz. Pcs. Without Screws	Size of Screws No.	Number of Screws to Each Hinge	Avg. No. of Doz. Pcs. in Standard Barrel Bright Steel	Avg. Wt. Per Doz. Pcs. Bright Steel, Lbs.	Avg. Net Wt. of Stand- ard Barrel Bright Steel, Lbs.
4	\$1.80	9	6	86	6	516
5	2.45	10	8	70	9¼	645
6	3.00	11	8	41	16½	675
8	5.00	13	9	26	25	650
10	7.40	14	9	16	37	590
12	10.70	16	10	11	50	560

WROUGHT STEEL LIGHT STRAP HINGES

No. 800



FIG. 5408

Size Inches	Br't Steel Per Doz. Pairs Without Screws	Size of Screws No.	No. of Screws to Each Hinge	No. of Doz. in Standard Barrels	Avg. Wt. Per Doz. Pairs Br't Steel Lbs.	Avg. Net Wt. of Standard Barrels Br't Steel Lbs.
3	\$0.85	6	6	225	2½	580
4	1.10	7	6	167	3½	570
5	1.35	8	8	128	5½	728
6	1.70	9	8	98	8¾	850
7	2.10	10	8	58	14½	840
8	2.40	10	8	54	15¼	812
10	3.30	10	8	35	21½	745
12	4.90	11	8	18½	35½	665
14	6.40	12	10	15	42½	650
16	7.90	12	10	12	61	...

WROUGHT STEEL MEDIUM STRAP HINGES

No. 802



FIG. 5409

Narrower at joint and of lighter gage steel than standard hinges of same lengths.

Size Inches	Br't Steel Per Doz. Pairs Without Screws	Size of Screws No.	No. of Screws to each Hinge	No. of Doz. Pcs. in Standard Barrel	Avg. Wt. Per Doz. Pairs Br't Steel Lbs.	Avg. Net Wt. of Standard Barrel Br't Steel Lbs.
3	\$0.75	6	6	225	2½	583
4	.90	9	6	100	6	620
5	1.25	10	8	70	9¾	700
6	1.70	12	8	46	16	750
8	2.70	12	8	27	25½	708
10	3.90	14	8	16	40	660
12	6.20	14	8	12	55	680
14	7.00	14	10	8¾	71½	645

WROUGHT STEEL HEAVY STRAP HINGES

No. 803



FIG. 5410

Size Inches	Br't Steel Per Doz. Pairs Without Screws	Size of Screw No.	No. of Screws to Each Hinge	No. of Doz. in Standard Barrels Br't Steel	Avg. Wt. Per Doz. Pairs Br't Steel Lbs.	Avg. Net Wt. of Standard Barrels Br't Steel Lbs.
4	\$ 1.60	9	6	145	5½	800
5	2.15	9	8	87	10¼	875
6	2.80	11	8	44	18½	815
8	4.50	12	8	24	32	785
10	6.80	12	8	13	51	660
12	10.40	14	10	9	74	660
14	12.20	16	10	8¼	84	700
16	14.00	16	10	6¼	96	620

CORRUGATED HEAVY STRAP HINGES

No. 804



FIG. 5411

Size Inches	Br't Steel Per Doz. Pairs Without Screws	Size of Screws No.	No. of Screws to Each Hinge	No. of Doz. Pcs. in Stand- ard Barrel Br't Steel	Average Weight Per Dozen Pairs Bright Steel Lbs.	Average Net Weight of Standard Barrel Bright Steel Lbs.
4	\$ 1.60	9	6	112	4 1/4	525
5	2.15	9	8	93	7 1/2	705
6	2.80	11	8	44	15	675
8	4.50	12	8	23 1/2	26	605
10	6.80	14	8	14	39	545
12	10.40	16	10	10	56	560

HINGE HASPS

No. 813



FIG. 5412

Size Inches	Br't Steel Per Single Doz. Without Screws	Size of Screws No.	No. of Screws to Each Hasp	No. of Single Doz. in Standard Barrel Br't Steel	Avg. Wt. Per Single Doz. Br't Steel Lbs.	Avg. Net Wt. of Standard Barrel Br't Steel Lbs.
3	\$0.50	6	7	250	2	510
4	.60	7	7	210	2 1/4	480
6	.80	9	8	103	5	570
8	1.05	10	8	58	8 1/4	480
10	1.50	10	8	37	11 1/2	430
12	2.10	12	8	30	19	570



FIG. 5413

No. 820

EXTRA HEAVY
HINGE HASPS

Length Inches	Width Inches	Br't St'l Per Single Doz. Without Screws
7 1/2	1 3/4	\$6.75

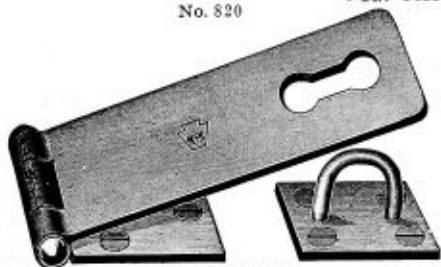


FIG. 5414

SAFETY HASPS

All screws completely concealed when Hasp is locked.

Size and shape of slot absorbs variation when door sags or shrinks. No shifting of staples necessary.

One hasp (with screws) in a box.

Size	inches	3	4 1/2	6
Bright Steel.....	per single dozen	\$1.25	\$1.70	\$2.40

WROUGHT HASPS AND STAPLES



FIG. 5415

No.	854	1854	4854
Size	Bright Steel	Japanned	Galvanized
Inches	Per Dozen	Per Dozen	Per Dozen
4	\$0.84	\$1.00	\$1.50
5	.90	1.10	1.60
6	1.00	1.20	1.80
7	1.10	1.30	2.00
8	1.30	1.60	2.50
9	1.70	2.00	3.00
10	2.00	2.30	3.50
11	2.30	2.60	4.00
12	2.60	3.10	4.50

One dozen in a box.

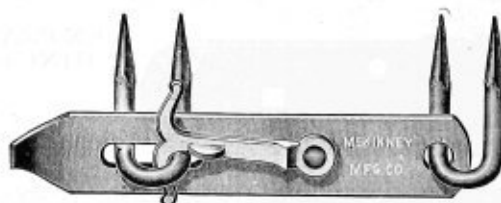
WROUGHT HASPS AND STAPLES
WITH DOUBLE HOOKS

FIG. 5416

No.	856	1856	4856
Size	Bright Steel	Japanned	Galvanized
Inches	Per Dozen	Per Dozen	Per Dozen
5	\$1.20	\$1.40	\$2.25
6	1.40	1.65	2.50
7	1.60	1.90	3.00
8	1.80	2.10	3.50
9	2.20	2.60	4.00
10	2.50	3.00	4.50
11	3.00	3.75	6.00
12	3.85	4.50	7.00

One dozen in a box.

SCREW HOOK AND STRAP STEEL HINGES

No. 821



FIG. 5417

Size Inches	Steel Per Lb.	Bolt Holes to Each Hinge	No. of Pairs in Standard Barrel	Avg. Wt. Per 100 Pcs. Wt. not Guar- anteed Against Fluctuation Lbs.
6	\$0.07	2	470	190
8	.07	2	370	217
10	.07	3	188	420
12	.07	3	165	480
14	.06	3	110	600
16	.06	3	100	640
18	.06	3	94	788
20	.06	4	68	972
22	.05	4	68	1025
24	.05	4	50	1390
30	.05	4	...	2100
36	.05	4	...	2350

SCREW HOOK AND EYE STEEL HINGES

No. 823



FIG. 5418

½ Inch
\$0.10

¾ Inch
\$0.08

¾ Inch, ¾ Inch
and 1 Inch
\$0.07 per lb.

WROUGHT STAPLES



FIG. 5419

No.	\$49	1849	4849
Size Inches	Bright Steel Per Gross	Japanned Per Gross	Galvanized Per Gross
1	\$1.20	\$1.40	\$1.80
1½	1.25	1.50	2.25
2	1.70	2.00	3.00
2½	2.35	2.75	4.00
3	3.20	3.75	6.00
3½	3.70	4.35	7.00
4	5.25	6.20	9.00



FIG. 5420

Nos. 5 and 10

ROLLER BEARING DOOR HANGERS

NO. 1900

These hangers are anti-friction on any length of track. They are fully covered; have cold-rolled steel axles and roller bearings, and are so constructed they cannot get out of order. Can be used on any standard track.

No.	Japanned Per Doz. Pcs.	No. in a Crate Doz. Pcs.	Avg. Wt. of Standard Crates, Lbs.
1 Special	\$15.00	1	65
2 Standard	18.00		92

DOOR HANGERS

NO. 1901 SLOT PATTERN

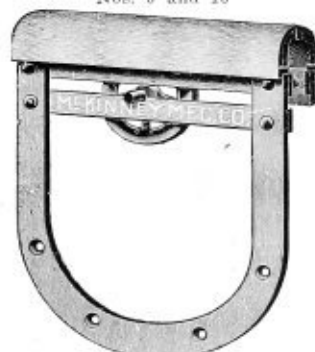


FIG. 5421

Size by No.	Length of Run Feet
5	5
5½	5
10	10
10½	10

Japanned Per Doz. Pcs.
\$15.00
15.00
18.00
18.00



FIG. 5422

No. of Hang- ers in a Crate Doz. Pcs.	Avg. Net Wt. of Standard Crates, Lbs.
½	100
¾	95
1½	137
2½	130



FIG. 5423

DOOR HANGER TRACK

For use with No. 1900 and 1901 Hangers. Cannot be used with Hinged Hangers.

Size Inches	Japanned Per Foot Without Screws	Lengths 4 Ft. Pcs.	Lengths 6 Ft. Pcs.	Lengths 8 Ft. Pcs.	Lengths 10 Ft. Pcs.	Lengths 12 Ft. Pcs.
1 x 1/16	\$0.07½	12	8	8	6	6
1¼ x 1/16	.08¾	12	8	8	6	6
1½ x 1/16	.10	12	8	8	6	6
No. ft. in bdl.	..	48	48	64	60	72
Avg. wt., bdl.	45	45	64	60	60	73

KING'S CHARM HINGE JOINT DOOR HANGERS

NO. 1902—ROLLER BEARING

Made entirely of steel—wheels excepted—and fitted with roller bearings.

Size by Name	Japanned Per Doz. Prs.	No. of Hangers in a Box Pairs	No. of Hangers in a Standard Case Doz. Prs.	Avg. Net Wt. of Standard Cases, Lbs.
King's Charm	\$16.00	1	1	80

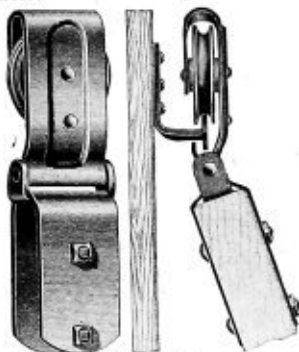


FIG. 5424

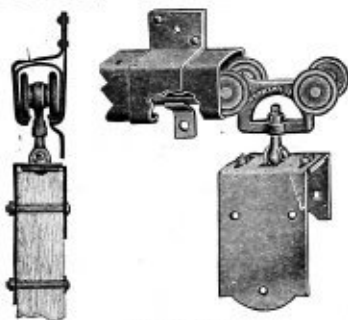
THE "PITTSBURGH" TROLLEY DOOR HANGER

FIG. 5425

From the very nature of this door hanger and the covered trolley track in which it runs, there is no way for it to jump the track—big heavy doors are up to stay as long as the building stands.

Doors can be hung to slide past each other by using parallel tracks held by brackets made especially for that purpose.

ONE SET IN A BOX

One set of "PITTSBURGH" No. 50 Hangers consists of 1 pair of hangers with bolts, 1 single center and 2 single end brackets with $2\frac{1}{2} \times 1\frac{3}{8}$ -inch lag screws for fastening to the building. Each set is carefully packed in a strong wooden box, 1 dozen sets in a case. Hangers can be had without bolts, screws and track brackets when desired.

SHIPPING WEIGHTS

One Hanger only.....	3¾ pounds
One complete set in box.....	10½ pounds
One dozen sets in case.....	140 pounds
List price per dozen sets.....	\$24.00
List price per dozen pairs (Hangers only).....	21.00

SPECIAL DOOR HANGER TRACK

FOR KING'S CHARM HANGERS

No. 1912



FIG. 5426

Size Inches	Japanned Per 100 Ft. Without Screws	Standard Lengths Feet	Pieces in a Bundle, Each Bundle Separate	No. of Feet in Bundle	Avg. Net Wt. of Bun- dles, Lbs.
1 1/4 x 3/8	\$11.00	4	4	16	16
		6	4	24	24
		8	4	32	32
		10	4	40	40

TROLLEY TRACK

No. 1931

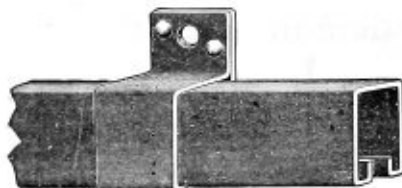


FIG. 5427

WROUGHT STEEL

This weather-proof and bird-proof trolley track is designed especially for use with the Pittsburgh No. 50 Hanger. It is made of No. 16 gage wrought steel, and is accurately turned and made uniformly straight. Japanned finish.

This track is 2 3/8 x 1 3/8 inches and is furnished regularly in 4, 5, 6, 8 and 10-foot lengths—special lengths when required.

	Japanned Per Foot	Standard Lengths Feet	Pieces in a Crate	Shipping Wt. Each Crate Lbs.
Center	\$0.20	4	8	58
		5	8	72
		6	8	84
		8	8	112
		10	8	140
End				



FIG. 5428



FIG. 5429

TRACK BRACKETS

No. 22.	Center Bracket, japanned....per doz.	\$2.00
No. 33.	End Bracket, rights, jap'd....per doz.	2.50
No. 44.	End Bracket, lefts, jap'd....per doz.	2.50

SHELF BRACKETS



FIG. 5430

No.	1925	1925	1925 AC	1925 BP	5925
Size Inches	Japanned Per. Doz. Pcs. Without Screws	Bronzed Per Doz. Pcs. With Screws	Ant. Copper Per Doz. Pcs. With Screws	Brass Plated Per Doz. Pcs. With Screws	Nickel Per Doz. Pcs. With Screws
3x 4	\$ 1.20	\$ 3.75	\$ 3.75	\$ 3.75	\$ 3.75
4x 5	1.60	4.40	4.40	4.40	4.40
5x 6	2.20	5.00	5.00	5.00	5.00
5x 7	2.40	6.20	6.20	6.20	6.20
6x 8	3.00	8.20	8.20	8.20	8.20
7x 9	3.60	8.70	8.70	8.70	8.70
8x10	4.20	9.00	9.00	9.00	9.00
10x12	6.00	12.00	12.00	12.00	12.00
12x14	9.00	13.00	13.00	13.00	13.00
16x18	20.00	30.00	30.00	30.00	30.00

CAST IRON SASH WEIGHTS
ROUND ENDS AND LOOP EYES

FIG. 5431

Weight	each	2	3	3½	4	4½	5	5½	6	6½	7
Diameter	inches	1¼	1¼	1½	1½	1¾	1½	1½	1½	1½	1½
Length	inches	5¾	9	10	10	10¾	11½	12½	13½	14½	15½

Weight	each	7½	8	8½	9	9½	10	10½	11	11½	12
Diameter	inches	1½	1½	1½	1¾	1¾	1¾	1¾	1¾	1¾	1¾
Length	inches	16½	17½	18½	15½	16	16½	17	17¾	18½	19½

Weight	each	12½	13	13½	14	15	16	17	18	19	20
Diameter	inches	1¾	2	2	2	2	2	2	2	2	2
Length	inches	16¾	17	17½	18	19½	22	21½	22½	23½	26

Lengths from point to center of eye. Prices on application.

ALL STEEL SASH PULLEYS

TWO INCH WHEEL

No. 10—Ball-Bearing

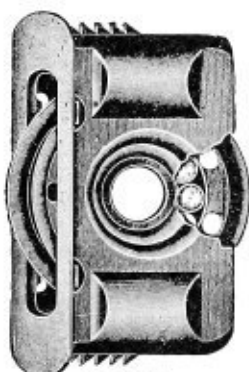


FIG. 5432

No. 110—Cone-Bearing

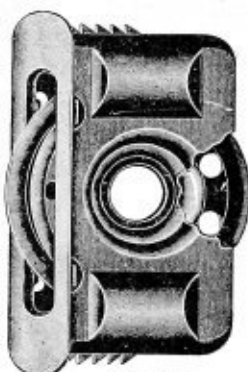


FIG. 5433

MORTISE any one of three ways—

First: Bore four $\frac{1}{2}$ -inch holes in line, centers $\frac{3}{4}$ inch apart, or—

Second: Bore mortise with No. 12 "Grand Rapids" Quadruple Bit;

Third: Make a common straight-side mortise with round ends, $\frac{1}{2}$ inch wide by $2\frac{1}{2}$ inches long.

No counter-boring for face-plate, no cutting or trimming. Every pulley fits.

SHIPPING WEIGHT—No. 110, about 165 pounds per barrel. No. 10, about 175 pounds per barrel.

PACKED—In barrels of 100 dozen each.

FINISH—Black weather-proof finish is shipped unless otherwise ordered. To avoid errors, use number and letter in ordering plated finishes.

The automatic saw-tooth fastening device reduces labor cost two to three dollars per barrel. Simply drive the pulley in the mortise in the usual way. The saw-teeth hold it securely.

CONE-BEARING

		List Price Per Dozen
No. 110.	Cone-Bearing, Black weather-proof finish.....	\$0.50
No. 110 G.	Cone-Bearing, Brass-plated face.....	.90
No. 110 H.	Cone-Bearing, Bronze-plated face.....	.90
No. 110 I.	Cone-Bearing, Oxidized Copper-plated face.....	.90

BALL-BEARING

No. 10.	Ball-Bearing, Black weather-proof finish.....	\$0.60
No. 10 G.	Ball-Bearing, Brass-plated face.....	1.00
No. 10 H.	Ball-Bearing, Bronze-plated face.....	1.00
No. 10 I.	Ball-Bearing, Oxidized Copper-plated face.....	1.00

Regular black weather-proof finish is always shipped unless a plated finish is specified.

GRAND RAPIDS ALL STEEL SASH PULLEYS



FIG. 5434

These pulleys have open hearth steel axles $\frac{1}{4}$ inch diameter and a wheel fitted with anti-friction bushing of the same material.

Face plates cannot break off when screwed in place. Steel pulleys are unbreakable.

Note how the back of the shell or housing completely envelopes the wheel, making it impossible for the cord to get out of the wheel groove.

Boston Bronze Lacquer is a high-grade finish which is baked on the steel in gas ovens under a high degree of heat. It is very durable and attractive.

No.	Finish	Wheel Inches	Face-Plate Inches	List Price Per Doz.
15 C.	Boston Bronze.....	1 $\frac{3}{4}$	1 x 3 $\frac{3}{4}$	\$0.42
15.	Natural Steel.....	1 $\frac{3}{4}$	1 x 3 $\frac{3}{4}$	.40
14 C.	Boston Bronze.....	2	1 x 4	.50
14.	Natural Steel.....	2	1 x 4	.47
18 C.	Boston Bronze.....	2	1 x 4 $\frac{1}{2}$	.50
18.	Natural Steel.....	2	1 x 4 $\frac{1}{2}$	.47
140 C.	Boston Bronze.....	2	1 $\frac{1}{2}$ x 4 $\frac{1}{2}$	.50
140.	Natural Steel.....	2	1 $\frac{1}{2}$ x 4 $\frac{1}{2}$	.47
20 C.	Boston Bronze.....	2 $\frac{1}{4}$	1 $\frac{1}{2}$ x 4 $\frac{1}{2}$	.60
20.	Natural Steel.....	2 $\frac{1}{4}$	1 $\frac{1}{2}$ x 4 $\frac{1}{2}$	.55

For Brass, Bronze or Oxidized Copper-plated finishes, add 40 cents to the list price of Natural Steel finish.

Boston Bronze (C) finish is recommended. This finish is regular on the above styles and is always shipped unless another finish is specified.

In ordering, please use above style numbers. When ordering plated finishes, affix letter to indicate finish as follows:

For Brass-plated finish affix letter.....G
 For Bronze-plated finish affix letter.....H
 For Oxidized Copper-plated finish affix letter.....I

PACKED

No.	Quantity Per Barrel	Weight Per Barrel (Approximate)
15	125 Dozen	220 Pounds
14	100 Dozen	210 Pounds
18	95 Dozen	200 Pounds
140	90 Dozen	207 Pounds
20	75 Dozen	200 Pounds

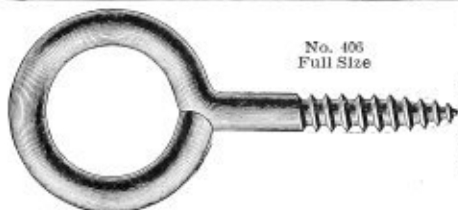


FIG. 5435

BRIGHT WIRE GOODS

SCREW EYES

No.	Per Gross	No.	Per Gross	No.	Per Gross	No.	Per Gross	No.	Per Gross	No.	Per Gross
0	\$16.00	7	\$3.80	14	\$1.50	110	\$2.50	205	\$5.80	212	\$1.70
1	13.00	8	3.30	104	7.00	111	2.00	206	4.50	213	1.50
2	11.00	9	2.80	105	5.80	112	1.70	207	3.80	214	1.50
3	9.00	10	2.50	106	4.50	113	1.50	208	3.30	.....	.....
4	7.00	11	2.00	107	3.80	114	1.50	209	2.80	.....	.....
5	5.80	12	1.70	108	3.30	114½	1.50	210	2.50	.....	.....
6	4.50	13	1.50	109	2.80	204	7.00	211	2.00	.....	.....

No. 405
Full Size

MOSQUITO BAR EYES

No. 406	.....	\$11.00
No. 416	.....	12.00
No. 426	.....	13.00
No. 436	.....	14.00

FIG. 5436

SCREW HOOKS

Nos.	904	905	906	907	908	
Per gross	\$10.00	8.00	6.00	4.50	4.00	
Nos.	909	910	911	912	913	914
Per gross	\$3.50	3.00	2.80	2.50	2.30	2.00

SCREW HOOKS



FIG. 5437



FIG. 5438

No.	Per Gross	No.	Per Gross	No.	Per Gross	No.	Per Gross	No.	Per Gross	No.	Per Gross
800	\$21.00	806	\$6.00	811	\$2.80	702	\$15.00	707	\$4.50	713	\$2.30
801	18.00	806½	5.30	812	2.50	703	12.50	708	4.00	714	2.00
802	15.00	807	4.50	813	2.30	704	10.00	709	3.50	.....	.....
803	12.50	808	4.00	814	2.00	705	8.00	710	3.00	.....	.....
804	10.00	809	3.50	700	21.00	706	6.00	711	2.80	.....	.....
805	8.00	810	3.00	701	18.00	706½	5.30	712	2.50	.....	.....

Nos. 800 to 814 are like cut above.

Nos. 700 to 714 are same except has blunt point.

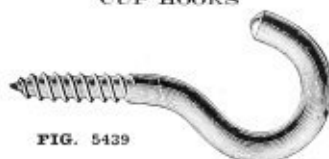
BRIGHT WIRE GOODS
CUP HOOKS

FIG. 5439

Number	Per Gross	Number	Per Gross	Number	Per Gross
600	\$21.00	605	\$8.00	610	\$3.00
601	18.00	606	6.00	611	2.80
602	15.00	607	4.50	612	2.50
603	12.50	608	4.00	613	2.30
604	10.00	609	3.50	614	2.00

NO. 40—BRIGHT WIRE HOOKS AND EYES

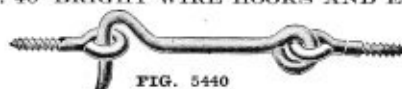


FIG. 5440

Size.....Inch	1½	2	2½	3	3½	4	4½	5	6	8
Price....per gross	\$6.50	8.00	10.00	12.00	14.00	17.00	20.00	24.00	30.00	36.00

BRASS WIRE HOOKS AND EYES

Size.....Inches	1½	2	2½	3	3½	4	4½
Price.....per gross	\$24.00	30.00	36.00	46.00	58.00	64.00	76.00

NO. 412—BRASS SCREW HOOKS



FIG. 5441

Size.....Inch	1½	5/8	¾	7/8	1	1⅛	1¼	1½	1¾	2
Price....per gross	\$3.75	3.85	4.00	4.50	5.25	7.00	9.00	11.00	15.00	18.00

Brass wire polished.

NO. 81—BRASS CUP HOOKS



FIG. 5442

Size.....Inch	3/8	1/2	5/8	¾	7/8	1	1⅛	1¼	1½	1¾
Price....per gross	\$3.65	3.75	3.85	4.00	4.50	5.25	7.00	9.00	11.00	15.00

NO. 60—HEAVY BRASS HOOKS AND EYES



FIG. 5443

Size.....Inch	1	1¼	1½	1¾	2
Price.....per gross	\$3.00	3.25	3.50	4.00	4.75

Heavy, double convex, either right or left hand.



FIG. 5444

WROUGHT SCREW HOOKS

Size of rod.....Inches	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
Length over all.....inches	$4\frac{1}{4}$	$4\frac{1}{2}$	$4\frac{3}{4}$	$5\frac{1}{4}$	6	7	8
" to bend of hook....."	$2\frac{3}{8}$	$2\frac{3}{8}$	$2\frac{5}{8}$	$2\frac{7}{8}$	$3\frac{3}{4}$	4	$4\frac{1}{8}$
No. 122. Galvanized.....per dozen	\$1.20	1.35	1.50	2.10	3.30	5.40	7.50

One dozen in a box.



FIG. 5445

WROUGHT HAMMOCK HOOKS

No. 37. Galvanized, with plate, $\frac{3}{8}$ -inch iron.

Per dozen.....\$2.75

No. 47. Galvanized, with screw, $\frac{3}{8}$ -inch iron.

Per dozen.....\$2.40

One dozen in a box.

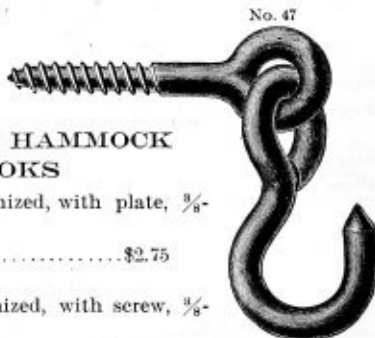


FIG. 5446



FIG. 5447

WROUGHT TRAP DOOR RINGS AND STAPLES



FIG. 5448

Size.....Inches	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3
Rings only, No. 52. Galvanized...per gross	\$14.50		\$17.00		\$21.00	\$27.00
" and staples, No. 57. " " "	17.50		21.00		25.00	32.00

Quarter gross in a box.

WROUGHT EYE BOLTS



FIG. 5449



FIG. 5450

WROUGHT EYE BOLTS

Size of rod.....Inches	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
Length, including eye.....inches	$3\frac{3}{4}$	4	$4\frac{1}{2}$	$5\frac{1}{4}$	$5\frac{3}{4}$	$6\frac{3}{4}$	$8\frac{1}{4}$
" excluding " "	$2\frac{3}{8}$	$2\frac{7}{16}$	$2\frac{3}{4}$	3	$3\frac{1}{2}$	$3\frac{3}{4}$	$3\frac{3}{4}$
Size, inside of eye..... "	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{3}{8}$	$1\frac{3}{4}$
No. 102. Galvanized.....per dozen	\$1.30	1.70	2.00	2.80	3.40	5.50	9.60

WROUGHT EYE BOLTS WITH NUT

$\frac{1}{2}$ -inch rod and smaller	Length, including eye.....Inches	$3\frac{1}{2}$	4
	" " excluding "" "	$2\frac{1}{8}$	$2\frac{3}{8}$
No. 73.	Galvanized $\frac{9}{16}$ -inch rod, $\frac{3}{4}$ -inch inside eye.....per dozen	\$2.60	.....
No. 83.	" " $\frac{3}{8}$ " " " $\frac{7}{8}$ " " " " " " " " " "	3.00	.....
No. 93.	" " $\frac{7}{16}$ " " " 1 " " " " " " " "	\$3.50	.....

$\frac{1}{2}$ -inch rod and smaller	Length, including eye, in. excluding " "	5 2 $\frac{3}{8}$	6 4	8 6	10 7 $\frac{3}{8}$	11 $\frac{1}{2}$
No. 103. Galvanized $\frac{1}{2}$ -in. rod, 1 $\frac{1}{8}$ -in. inside eye, per dozen		\$4.20	\$4.80	\$5.30	\$6.50	.....
No. 113. " $\frac{5}{8}$ " " 1 $\frac{3}{8}$ " " " " "			7.50	8.30	.....	\$9.50

Nos. 103 and 113 half dozen in a box.

Other numbers one dozen.

REGULAR "BESTOVALL" WIDE COTTON DUCK

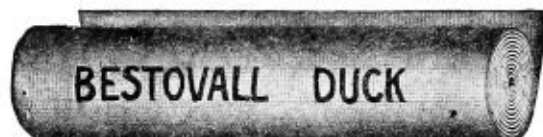


FIG. 5451

LIST JULY 9, 1917

Nos.	2-0	0	1	2	3	4	5	6	7	8	9	10	11	12
26 in.	\$1.46	1.38	1.32	1.24	1.16	1.10	1.04	.98	.94	.86	.80	.72	.68	.60
28 in.	1.56	1.50	1.42	1.34	1.26	1.20	1.12	1.04	1.00	.92	.86	.78	.72	.64
30 in.	1.68	1.60	1.52	1.42	1.34	1.28	1.20	1.12	1.08	.98	.92	.84	.78	.70
32 in.	1.80	1.70	1.62	1.52	1.44	1.36	1.26	1.20	1.14	1.04	.98	.90	.82	.74
34 in.	1.90	1.80	1.72	1.62	1.52	1.44	1.34	1.26	1.22	1.12	1.04	.94	.88	.78
36 in.	2.02	1.92	1.82	1.72	1.62	1.52	1.42	1.34	1.28	1.18	1.10	1.00	.92	.82
38 in.	2.12	2.02	1.92	1.80	1.70	1.62	1.50	1.42	1.36	1.24	1.16	1.06	.98	.88
40 in.	2.24	2.12	2.02	1.90	1.80	1.70	1.58	1.48	1.42	1.30	1.22	1.12	1.02	.92
42 in.	2.34	2.24	2.12	2.00	1.88	1.78	1.66	1.56	1.50	1.38	1.28	1.16	1.08	.96
44 in.	2.46	2.34	2.22	2.10	1.96	1.86	1.74	1.64	1.56	1.44	1.34	1.22	1.12	1.00
46 in.	2.58	2.44	2.32	2.18	2.06	1.94	1.82	1.70	1.64	1.50	1.40	1.28	1.18	1.06
48 in.	2.74	2.60	2.46	2.32	2.20	2.08	1.94	1.82	1.74	1.56	1.48	1.36	1.26	1.12
50 in.	2.86	2.70	2.56	2.42	2.28	2.16	2.02	1.90	1.82	1.66	1.54	1.42	1.30	1.16
52 in.	2.96	2.82	2.66	2.52	2.38	2.24	2.10	1.96	1.88	1.74	1.60	1.48	1.36	1.20
54 in.	3.08	2.92	2.78	2.62	2.48	2.34	2.18	2.04	1.96	1.80	1.66	1.52	1.40	1.26
56 in.	3.20	3.04	2.88	2.72	2.56	2.42	2.26	2.12	2.04	1.86	1.72	1.58	1.46	1.30
58 in.	3.30	3.14	2.98	2.82	2.64	2.50	2.34	2.20	2.10	1.94	1.78	1.64	1.52	1.34
60 in.	3.46	3.28	3.10	2.94	2.76	2.64	2.46	2.32	2.22	2.04	1.88	1.72	1.60	1.42
62 in.	3.56	3.38	3.22	3.04	2.86	2.74	2.54	2.40	2.30	2.10	1.94	1.78	1.64	1.46
64 in.	3.68	3.50	3.32	3.14	2.94	2.82	2.64	2.46	2.36	2.16	2.00	1.84	1.70	1.52
66 in.	3.80	3.60	3.42	3.22	3.04	2.90	2.72	2.54	2.44	2.24	2.08	1.90	1.74	1.56
68 in.	3.92	3.72	3.52	3.32	3.14	3.00	2.80	2.62	2.52	2.32	2.14	1.96	1.80	1.60
70 in.	4.02	3.82	3.62	3.42	3.22	3.08	2.88	2.70	2.58	2.38	2.20	2.02	1.86	1.66
72 in.	4.26	4.06	3.84	3.62	3.42	3.22	3.02	2.82	2.70	2.50	2.30	2.10	1.94	1.72
74 in.	4.38	4.16	3.94	3.72	3.50	3.32	3.10	2.90	2.78	2.56	2.36	2.16	2.00	1.78
76 in.	4.50	4.28	4.06	3.82	3.60	3.42	3.18	2.98	2.86	2.62	2.42	2.22	2.04	1.82
78 in.	4.62	4.38	4.16	3.92	3.70	3.50	3.26	3.06	2.94	2.70	2.50	2.28	2.10	1.88
80 in.	4.74	4.50	4.26	4.02	3.80	3.60	3.36	3.14	3.00	2.76	2.56	2.34	2.16	1.92
82 in.	4.94	4.70	4.46	4.20	3.96	3.74	3.50	3.28	3.16	2.88	2.66	2.42	2.24	2.00
84 in.	5.06	4.82	4.56	4.32	4.06	3.84	3.58	3.36	3.22	2.94	2.74	2.50	2.30	2.04
86 in.	5.18	4.94	4.68	4.42	4.16	3.94	3.68	3.44	3.30	3.02	2.80	2.56	2.36	2.10
88 in.	5.30	5.04	4.78	4.52	4.24	4.02	3.76	3.52	3.36	3.08	2.86	2.62	2.40	2.14
90 in.	5.44	5.16	4.88	4.62	4.34	4.12	3.84	3.60	3.44	3.16	2.92	2.68	2.46	2.20
92 in.	5.66	5.38	5.10	4.80	4.52	4.28	3.98	3.74	3.58	3.28	3.04	2.78	2.54	2.28
94 in.	5.78	5.48	5.20	4.92	4.62	4.38	4.08	3.84	3.68	3.38	3.10	2.84	2.62	2.32
96 in.	5.90	5.60	5.32	5.02	4.72	4.46	4.18	3.90	3.74	3.42	3.18	2.90	2.68	2.38
98 in.	6.14	5.82	5.52	5.22	4.90	4.64	4.34	4.06	3.88	3.56	3.30	3.02	2.78	2.46
100 in.	6.26	5.94	5.64	5.32	5.00	4.74	4.42	4.14	3.96	3.64	3.36	3.08	2.82	2.52
102 in.	6.38	6.06	5.74	5.42	5.10	4.84	4.52	4.24	4.04	3.70	3.42	3.14	2.88	2.56
104 in.	6.50	6.18	5.86	5.54	5.20	4.94	4.60	4.32	4.12	3.78	3.50	3.20	2.94	2.62
106 in.	6.76	6.42	6.08	5.74	5.40	5.12	4.78	4.48	4.28	3.92	3.62	3.32	3.04	2.70
108 in.	6.88	6.54	6.20	5.86	5.50	5.20	4.86	4.56	4.34	4.00	3.70	3.38	3.10	2.76
110 in.	7.00	6.66	6.30	5.96	5.60	5.30	4.96	4.64	4.44	4.06	3.76	3.44	3.16	2.80
112 in.	7.14	6.78	6.42	6.06	5.72	5.40	5.04	4.72	4.52	4.14	3.82	3.50	3.22	2.86
114 in.	7.52	7.13	6.77	6.39	6.02	5.69	5.31	4.97	4.75	4.35	4.02	3.68	3.37	3.00
116 in.	7.65	7.27	6.88	6.50	6.12	5.79	5.40	5.05	4.84	4.34	4.03	3.74	3.43	3.05
120 in.	7.91	7.52	7.12	6.73	6.33	5.99	5.59	5.23	5.00	4.58	4.23	3.87	3.55	3.15
128 in.	8.74	8.30	7.86	7.42	7.00	6.60	6.15	5.78	5.50	5.04	4.66	4.26	3.90	3.48
132 in.	9.46	8.98	8.52	8.04	7.56	7.12	6.66	6.24	5.94	5.46	5.04	4.60	4.20	3.74
136 in.	10.98	10.44	9.88	9.34	8.78	8.30	7.74	7.24	6.86	6.30	5.80	5.30	4.74	4.28
144 in.	11.62	11.04	10.46	9.88	9.30	8.78	8.20	7.66	7.26	6.66	6.14	5.60	5.04	4.54

REGULAR WALL TENTS

COMPLETE WITH
ROPES, POLES
AND STAKES

This is the most
popular style of Tent
for camping.



FIG. 5452

Size	Center	Wall	8-oz. S. F.	10-oz. S. F.	12-oz. S. F.	8-oz. D. P.	10-oz. D. P.	12-oz. D. P.	Allowance for Poles
5 x 7	5½	3	\$16.00	\$19.10	\$22.30	\$17.30	\$20.60	\$24.20	\$0.60
5 x 9	5½	3	19.80	23.70	27.60	21.40	25.50	29.90	.70
7 x 7	6½	3	21.30	25.50	29.70	23.00	27.50	32.20	.74
7 x 9½	6½	3	25.90	31.00	36.10	27.90	33.40	39.10	.88
7 x 12	6½	3	30.40	36.40	42.40	32.80	39.20	46.00	1.04
8 x 10	6½	3	28.20	33.70	39.30	30.40	36.30	42.60	1.00
8 x 12	6½	3	31.20	37.30	43.50	33.70	40.20	47.20	1.08
9½ x 9½	7	3	31.20	37.30	43.50	33.70	40.20	47.20	1.06
9½ x 12	7	3	36.50	43.70	50.90	39.40	47.10	55.20	1.30
9½ x 14	7	3	41.10	49.20	57.30	44.30	53.00	62.10	1.44
12 x 12	8	3½	45.60	54.60	63.60	49.20	58.80	69.00	1.46
12 x 14	8	3½	51.00	61.00	71.10	55.00	65.70	77.10	1.80
12 x 16½	8	3½	56.70	67.80	79.00	62.80	75.00	88.00	2.00
12 x 18½	8	3½	62.40	74.70	87.00	69.70	83.30	97.80	2.16
12 x 21	8	3½	68.40	81.90	95.40	76.30	91.20	107.00	2.30
12 x 23½	8	3½	74.50	89.20	103.90	82.90	99.00	116.20	2.60
14 x 14	9	4	61.60	73.70	85.90	66.50	79.40	93.20	2.16
14 x 16½	9	4	68.40	81.90	95.40	75.50	90.20	105.80	2.36
14 x 18½	9	4	75.30	90.10	105.00	83.70	100.00	117.30	2.60
14 x 21	9	4	82.10	98.30	114.50	91.10	108.80	127.70	2.80
14 x 23½	9	4	88.20	105.60	123.00	98.40	117.60	138.00	3.10
16½ x 16½	10½	5	84.40	101.00	117.70	93.50	111.80	131.10	2.80
16½ x 18½	10½	5	92.80	111.10	129.40	102.50	122.50	143.80	3.06
16½ x 21	10½	5	100.00	119.70	139.40	110.70	132.20	155.30	3.30
16½ x 23½	10½	5	108.70	130.10	151.60	119.80	143.10	167.90	3.64
16½ x 30	10½	5	144.00	171.00	198.00	154.80	183.60	214.00	4.66
16½ x 35	10½	5	160.80	191.00	221.10	172.90	205.00	239.20	5.20
18½ x 18½	11	5	104.20	124.70	145.30	114.80	137.20	161.00	3.68
18½ x 21	11	5	112.50	134.70	156.90	123.90	148.00	173.70	4.00
18½ x 23½	11	5	122.40	146.50	170.70	133.70	159.80	187.50	4.38
18½ x 30	11	5	160.00	190.00	220.00	172.00	204.00	238.00	5.28
18½ x 35	11	5	178.40	211.90	245.30	191.80	227.50	265.40	5.90
18½ x 42	11	5	204.80	243.20	281.60	220.20	261.20	304.60	6.88

Tents furnished without poles at net deductions as per above schedule.

Wall poles not included in price, but furnished 2x2, 5 feet long, at 15 cents each net.

Prices do not include flies. Regular flies which extend 6 inches over the eaves of tents will be furnished without poles at one-half the price of the tent.

If higher walls than list specified are wanted, add 5 per cent to list for each additional 6 inches so added.

Sod cloths, 9 inches wide, sewed around the bottom of tent wall at 2c per lineal foot net.

Hand roping on ridge will be furnished at 24c per lineal foot net; on eaves, gables or rafters, at 14c per lineal foot.

Jointed poles, uprights, \$1.00 for each joint; ridge poles, \$1.50 for each joint.

STABLE TENTS

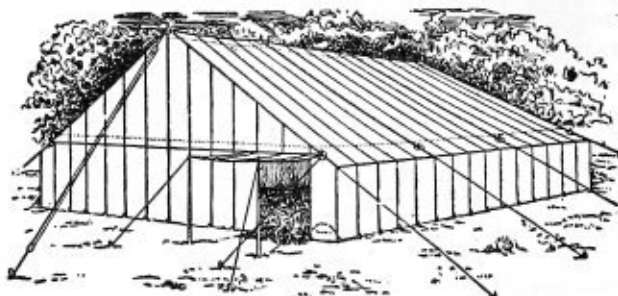


FIG. 5453

Fully roped on Ridge, Eaves, Gables, across Gable Ends and every three widths or seven feet on the top, also around the bottom of wall. Complete with Poles, Iron Banded Stakes, Guy Ropes and two Tackles, Blocks for setting up.

Size	Center	Wall	8-oz. D. F.	10-oz. D. F.	12-oz. D. F.	8-oz. Army	10-oz. Army	12-oz. Allowance Army for Poles	
28x21	14	6	\$341.64	\$380.26	\$418.88	\$374.40	\$416.52	\$453.96	\$18.72
28x28	14	6	411.72	458.26	504.78	451.20	501.96	547.08	22.56
28x35	14	6	483.26	537.88	592.50	529.60	589.18	642.14	26.48
28x42	14	6	553.34	615.86	678.40	606.40	674.62	735.26	30.32
28x49	14	6	623.42	693.88	764.34	683.20	760.06	828.38	34.16
28x56	14	6	694.96	773.50	852.04	761.60	847.28	923.44	38.08
28x63	14	6	765.04	851.50	937.96	838.40	932.72	1,016.56	41.92
28x70	14	6	835.12	929.50	1,023.88	915.20	1,018.16	1,109.68	45.76
28x77	14	6	906.66	1,009.12	1,111.60	993.60	1,105.38	1,204.74	49.68
28x84	14	6	976.74	1,087.12	1,197.50	1,070.40	1,190.82	1,297.86	53.52
30x21	14	6	360.62	401.38	442.14	395.20	439.66	479.18	19.76
30x28	14	6	433.62	482.62	531.62	475.20	528.66	576.00	23.76
30x35	14	6	508.08	565.50	622.92	556.80	619.44	675.12	27.84
30x42	14	6	581.08	646.76	712.42	636.80	708.44	772.12	31.84
30x49	14	6	654.08	728.00	801.92	716.80	797.00	869.12	35.84
30x56	14	6	728.54	810.88	893.22	798.40	888.22	968.06	39.92
30x63	14	6	801.54	892.12	982.70	878.40	977.22	1,065.06	43.92
30x70	14	6	874.54	973.38	1,072.22	958.40	1,066.22	1,162.06	47.92
30x77	14	6	949.00	1,056.26	1,163.50	1,040.00	1,157.16	1,261.00	52.00
30x84	14	6	1,022.00	1,137.50	1,253.00	1,120.00	1,246.00	1,358.00	56.00

Where walls are wanted one grade lighter than the top of tent, an allowance of 4 per cent will be made.

When higher walls are wanted, add 5 per cent for each additional six inches.

If no walls are wanted, an allowance of 21 per cent will be made.

Other roping than stated above will be charged at 14c per lineal foot net.

NOTICE.—All stable tents sewed double seams on lock-stitch machine with extra heavy thread.

WATERPROOF TARPAULINS AND WAGON COVERS

We can furnish Tarpaulins and Wagon Covers made of a variety of fabrics, each selected for unusual strength and service.

We particularly recommend Hettrick Khaki Watershed Covers, because it is a thoroughly water-proof fabric of unusual strength.

The other fabrics listed are used widely and will be found satisfactory for ordinary purposes.

All Covers are sewed with a special lap-felled seam which makes them impervious to water, and are fitted with reinforced eyelets.

SIZE	Hettrick Khaki Watershed	14-oz. White Sail Duck	16-oz. White Sail Duck	18-oz. White Sail Duck	16-oz. Brown Paraffine	14-oz. Brown Paraffine	10-oz. Brown Oil
5x 8	\$ 9.60	\$ 8.00	\$ 9.60	\$11.20	\$ 9.60	\$ 8.80	\$ 8.00
5x10	12.00	10.00	12.00	14.00	12.00	11.00	10.00
5x12	17.28	12.00	17.28	16.80	17.28	13.20	12.00
6x 8	11.52	9.60	11.52	13.44	11.52	10.56	9.60
6x10	14.40	12.00	14.40	16.80	14.40	13.20	12.00
6x12	17.28	14.40	17.28	20.16	17.28	15.84	14.40
6x14	20.16	16.80	20.16	23.52	20.16	18.48	16.80
7x 8	13.44	11.20	13.44	15.68	13.44	12.32	11.20
7x10	16.80	14.00	16.80	19.60	16.80	15.40	14.00
7x12	20.32	16.80	20.32	23.52	20.32	18.48	16.80
7x14	23.52	19.60	23.52	27.44	23.52	21.56	19.60
7x16	26.88	22.40	26.88	31.36	26.88	24.64	22.40
8x10	19.20	16.00	19.20	22.40	19.20	17.60	16.00
8x12	23.04	19.20	23.04	26.88	23.04	21.12	19.20
8x13	26.88	22.40	26.88	31.36	26.88	24.64	22.40
8x16	30.72	25.60	30.72	35.84	30.72	28.16	25.60
9x12	25.92	21.60	25.92	30.24	25.92	23.76	21.60
9x14	30.24	25.20	30.24	35.28	30.24	27.72	25.20
9x16	34.56	28.80	34.56	40.32	34.56	31.68	28.80
9x18	38.88	32.40	38.88	45.36	38.88	35.64	32.40
10x12	28.80	24.00	28.80	33.60	28.80	26.40	24.00
10x14	33.60	28.00	33.60	39.20	33.60	30.80	28.00
10x16	38.40	32.00	38.40	44.80	38.40	35.20	32.00
10x18	43.20	36.00	43.20	50.40	43.20	39.60	36.00
10x20	48.00	40.00	48.00	56.00	48.00	44.00	40.00
12x14	40.32	33.60	40.32	47.04	40.32	36.96	33.60
12x16	46.08	38.40	46.08	53.76	46.08	42.24	38.40
12x18	51.84	43.20	51.84	60.48	51.84	47.52	43.20
12x20	57.60	48.00	57.60	67.20	57.60	52.80	48.00
14x16	53.76	44.80	53.76	62.72	53.76	49.28	44.80
14x18	60.48	50.40	60.48	70.56	60.48	55.44	50.40
14x20	67.20	56.00	67.20	78.40	67.20	61.60	56.00
14x24	80.64	67.20	80.64	94.08	80.64	73.92	67.20

TOWER'S FISH BRAND WATER-PROOF CLOTHING

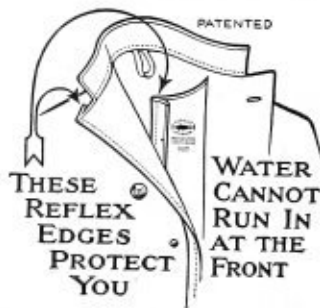


This well-known mark of excellence in waterproof clothing stands for all that is best in materials, processes, and workmanship. It has been a guarantee of the highest value in slickers and all kinds of wet-weather service garments since 1836. On every FISH BRAND label appear the simple words "Satisfaction Guaranteed," which mean that we will make good any FISH BRAND garment which, for any reason, fails to do its full duty.

Reflex Edges and Inside Storm-Lap are two of the most practical improvements ever made in waterproof clothing construction, and many FISH BRAND garments have these patented features. Note particularly the better outward appearance of our Reflex styles, which are free from the unsightly outside storm-lap common to other slickers.

Inside Storm-Lap, shown in the design bearing small trade-mark, extends below the knees, and is out of sight when coat is buttoned.

Reflex Edges (see arrow points) prevent all water from running in at the front by conducting it to the bottom, so that sitting, walking, or driving into the hardest storm the wearer is kept absolutely dry.



This design is on tag attached to every Fish Brand Reflex garment.

Overalls No. 801



© A. J. Tower Co.

FIG. 5454

Pilot Hat No. 84



© A. J. Tower Co.

FIG. 5455

Tarp Hat, No. 11



© A. J. Tower Co.

FIG. 5456

TOWER'S FISH BRAND PANTS AND HATS

String pants are worn by fishermen and sailors. Overalls are adapted to general uses.

The Pilot Hat, black or yellow, is the best finished and best wearing hat for the fishing trade now on the market.

The Tarp Hat, black or yellow, is a popular low-priced hat for the general trade, and when fitted with leather lamp fittings is very satisfactory as a miner's hat.

TOWER'S FISH BRAND WATER-PROOF CLOTHING

TOWER'S FISH BRAND REFLEX
SLICKERS, NO. 121

Made double throughout, and fitted with our patented Inside Storm-lap and Reflex Edges, which prevent water from running in at the front. Slickers have 27-inch split in back.

Two "Stayfast" Pockets, patented, that will not rip. Collar cloth lined, and fitted with throat piece. Inside storm cuffs.

Our patented "Stayfast" Pockets on Fish Brand Reflex Slickers are stayed by a strong tape so inserted that it takes all the strain and prevents pocket from ripping.

Reflex Slicker



Copyright, 1913, by A. J. Tower Co.

FIG. 5457

Storm King



Copyright, 1917, by A. J. Tower Co.

FIG. 5458

TOWER'S FISH BRAND STORM KING COAT

Made double throughout and fitted with our patented Interlocking Storm-lap, which makes it impossible for water to run in at the front of coat. Collar velvet lined, 4 inches high, and fitted with throat piece. Brass clasps. Inside storm cuffs. Two "Stayfast" Pockets (patented).

No. BR 331, Brown. No. B 331, Black.

For sizes and prices, see pages 1962 and 1963.

TOWER'S FISH BRAND WATER-PROOF CLOTHING CONTINUED

Suit



Copyright, 1913, by A. J. Tower Co.

FIG. 5459

TOWER'S FISH BRAND SUITS

No. 601 Jacket

No. 801 Overall

Our Jackets, when combined with the various styles of Pants, make snug working suits which for many purposes are better than long coats. Our Driver Hat, made in black only, is shown here.

Fish Brand Jackets and Pants are double throughout, and made in black or yellow.

Reflex
Medium Coat

Copyright, 1913, by A. J. Tower Co.

FIG. 5460

TOWER'S FISH BRAND REFLEX MEDIUM COATS

No. 421

Our Fish Brand Reflex Medium Coat is a shorter pattern of our Fish Brand Reflex Slicker. Double throughout. Collar cloth-lined. Inside storm cuffs. Two "Staydfast" Pockets (patented). Black or yellow.

The hat shown here is our Protector.

Frocks are made double throughout. They are 6 inches shorter than Medium Coats. Fish Brand Frocks are fitted with outside storm-lap, one pocket, cloth-lined collar, and inside storm cuffs. Black or yellow,

For sizes and prices, see pages 1962 and 1963.

Medium Coat No. 411



Copyright 1917-A.J. Tower Co.
FIG. 5461

**TOWER'S FISH BRAND
WATER-PROOF CLOTHING
CONTINUED**

**TOWER'S FISH BRAND MEDIUM
COATS NO. 411**

Fish Brand No. 411 is very popular with railway men and others who require a Medium Coat with special features. Fitted with long outside storm-lap, high corduroy-lined collar with throat piece, and brass clasps. Made double throughout. "Staydfast" Pocket (patented).

No. B 411, Black. No. BR 411, Brown.

APRONS

Barvels No. 4101



COPYRIGHT, 1907, BY A.J. TOWER CO.
FIG. 5462

Our Fish Brand Barvels, No. 4101, are made double throughout in black or yellow. Especially adapted to the needs of automobile washers, fishermen, cannery and packers.

Our Duck and Drill Aprons are used extensively by butchers, packers and tanners. Reinforced with a large outside patch. Black or yellow.

For sizes and prices see pages 1962 and 1963.

**Duck Aprons
No. 4149**



COPYRIGHT, 1907, BY A.J. TOWER CO.
FIG. 5463

TOWER'S WATER-PROOF CLOTHING

Our water-proof garments are air-proof as well. Claims of leakage are often made because of the condensation of perspiration upon the inside of the coat.

Sizes	Length	Fits Standard Breast measures as below	Sizes	Length	Fits Standard Breast measures as below
SLICKERS	in.	in.	SEABROOK JACKET	in.	in.
Size 0.....	58	44-46	Size 0.....	33	44-46
Size 1.....	56	41-43	Size 1.....	33	41-43
Size 2.....	54	38-40	Size 2.....	33	38-40
Size 3.....	52	35-37	Size 3.....	33	35-37
LONG COATS			AUTOMOBILE COATS		
Size 0.....	56	44-46	(Nos. 320 and 321)		
Size 1.....	54	41-43	Size 0.....	58	44-46
Size 2.....	52	38-40	Size 1.....	56	41-43
Size 3.....	50	35-37	Size 2.....	54	38-40
HANDICOAITS			Size 3.....	52	35-37
Size 0.....	54	44-46	NO. 521 FROCKS		
Size 1.....	54	41-43	Size 0.....	39	44-46
Size 2.....	52	38-40	Size 1.....	39	41-43
Size 3.....	50	35-37	Size 2.....	39	38-40
POMMELS			Size 3.....	39	35-37
Size 0.....	62	44-46			
Size 1.....	61	41-43		Waist	Leg
Size 2.....	59	38-40	OVERALLS		
Size 3.....	57	35-37	Size 0.....	48	32
STORM KING AND MOTOR COATS			Size 1.....	46	31
Size 0.....	56	44-46	Size 2.....	44	30
Size 1.....	55	41-43	Size 3.....	42	29
Size 2.....	54	38-40	STRING PANTS		
Size 3.....	53	35-37	Size 0.....	48	30
DREDNAUT LONG CTS.			Size 1.....	46	29
Size 0.....	55	44-46	Size 2.....	44	28
Size 1.....	54	41-43	Size 3.....	42	27
Size 2.....	52	38-40	SEABROOK PANTS		
Size 3.....	51	35-37	Size 0.....	42	30
MEDIUM COATS			Size 1.....	40	29
(All Styles)			Size 2.....	38	28
Size 0.....	44	44-46	Size 3.....	36	27
Size 1.....	44	41-43			
Size 2.....	44	38-40	APRONS	Length	Width
Size 3.....	44	35-37	FISH BRAND BARVELS		
FROCKS			Size 1.....	45	33
Size 0.....	38	44-46	Size 2.....	43	33
Size 1.....	38	41-43	Size 3.....	41	33
Size 2.....	38	38-40	Duck	50	40
Size 3.....	38	35-37	Drill	50	37
JACKETS			CAPIES		
Size 0.....	31	44-46	MEN'S NO. B 4315		
Size 1.....	30½	41-43	Length .....inches	48	50
Size 2.....	30	38-40	Sweep .....inches	136	136
Size 3.....	30	35-37		54	56
SEABROOK COATS				136	136
Size 0.....	56	44-46			
Size 1.....	54	41-43	HATS		
Size 2.....	52	38-40	All hats for men are made in the fol-		
Size 3.....	50	35-37	lowing sizes: 6¾, 7, 7¼, 7½.		

TOWER'S WATER-PROOF CLOTHING-CONTINUED

FISH BRAND YELLOW	Stock No.	Per Dozen
Reflex Slickers.....	121	.....
Reflex Long Coats.....	221	.....
Pommel Slickers.....	51	.....
Reflex Medium Coats..	421	.....
Frocks	501	.....
Jackets	601	.....
Overalls	801	.....
String Pants.....	901	.....
Seabrook Coats.....	251	.....
Seabrook Coats (ladies)	261	.....
Seabrook Jackets.....	631	.....
Seabrook Pants.....	931	.....
Boys' Coats.....	2362	.....
Boys' Pommel Slickers.	2051	.....
Boys' Jackets.....	2601	.....
Boys' Overalls.....	2801	.....

FISH BRAND, BLACK

Reflex Slickers.....	B 121	.....
Reflex Long Coats.....	B 221	.....
Handicoots	B 271	.....
Pommel Slickers.....	B 51	.....
Storm King Coats (with Interlocking Lap)....	B 331	.....
Drednaut Long Coats (with Cape).....	B 248	.....
Drednaut Medium Coats (with Cape).....	B 448	.....
Reflex Medium Coats...	B 421	.....
Medium Coats, with Buckles	B 411	.....
Frocks	B 501	.....
Jackets	B 601	.....
Overalls	B 801	.....
String Pants.....	B 901	.....
Men's Capes.....	B 4315	.....
Seabrook Coats.....	B 251	.....
Seabrook Coats(ladies')	B 261	.....
Automobile Coats.....	B 320	.....

FISH BRAND, BLACK

Ponchos, 45x72 inches..	B 4885	.....
Ponchos, 66x90 inches..	B 4853	.....
Camp Blankets, 45x72"	B 4850	.....
Boys' Coats.....	B 2362	.....
Boys' Capes.....	B 4312	.....
Boys' Pommel Slickers	B 2051	.....
Boys' Jackets.....	B 2601	.....
Boys' Overalls.....	B 2801	.....

FISH BRAND, OLIVE KHAKI

Reflex Slickers.....	OK 121	.....
Pommel Slickers.....	OK 51	.....
Pommel Slickers, with Buckles	OK 61	.....
Automobile Coats.....	OK 320	.....
Sport Coats.....	OK 321	.....
Hunting Coats.....	OK 521	.....

FISH BRAND, OLIVE KHAKI

	Stock No.	Per Dozen
Boys' Coats.....	OK 2362	.....
Boys' Capes.....	OK 4312	.....
Men's Capes.....	OK 4315	.....
Ponchos, 45x72 inches.	OK 4885	.....
Ponchos, 66x90 inches.	OK 4852	.....
Camp Blankets, 45x72"	OK 4850	.....

FISH BRAND, BROWN

Storm King Coats (with Interlocking Lap)....	BR 331	.....
Medium Coats, with Buckles	BR 411	.....

FISH BRAND, OLIVE

Handicoots	O 271	.....
Boys' Coats, with Buckles	O 2365	.....

WATER-PROOF HATS

	Yellow		Black	
	Stock No.	Per Dozen	Stock No.	Per Dozen
Tourist			B 35	.....
Neptune	31	\$24.00		.....
Pathfinder (OK)	OK 21	18.00		.....
Navy	3	18.00	B 3	.....
Protector	6	13.20	B 6	.....
Protector (OK)	OK 6	13.20	B 4	.....
Pilot	4	13.20	B 1	.....
Driver .....				.....
Tarp	11	7.60	B 11	.....
Head Light..	12	8.80	B 12	.....
Pawlin, with Leathers	22	9.20	B 22	.....
Tins	24	9.20	B 24	.....
Boys' Middy	10	9.20	B 10	.....
Boys' Middy (OK)	OK 10	9.20		.....
Boys' Tarp..	15	7.20	B 15	.....

WATER-PROOF APRONS

FISH BRAND	Yellow		Black	
	Stock No.	Per Dozen	Stock No.	Per Dozen
Common Barvels ..	4101	\$21.00	B 4101	.....
Petticoat Barvels ..	4201	40.00		.....
Duck	4149	32.00	B 4149	.....
Drill	4138	23.20	B 4138	.....

TOWER'S WATERPROOF DRESSING

Black or Yellow		Per Dozen
Pint Cans.....		
Half-pint Cans.....		

7-LEAGUE SEWED LEATHER SOLED RUBBER BOOTS WITH IRON HEELS

Short or Knee Style

These boots cannot leak, for the soles, which are leather, are stitched to the rubber welt around the outside edges of the feet of the boots, so there are no perforations through the sole into the boots. They are the only leather-soled rubber boots made without the use of nails or screws to hold the soles on. (Also furnished with rubber soles.)

Soles can be renewed. Leather insoles prevent sore feet.

Iron heels, never wear out.



FIG. 5464

"Storm King" (Half Hip)



FIG. 5465

SHORT OR KNEE STYLE

Sizes 6 to 12.

List.....per pair \$10.90

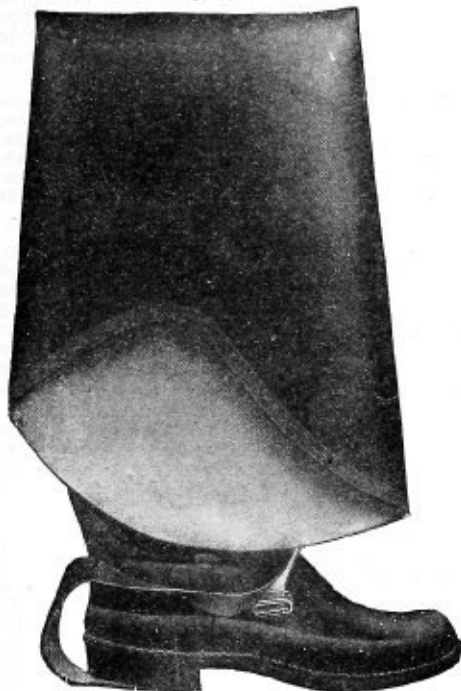
STORM KING STYLE

Sizes 6 to 12.

List.....per pair \$12.50

7-LEAGUE SEWED LEATHER SOLED RUBBER BOOTS**WITH IRON HEELS**

Hip Style

**FIG. 5466**

and heel all the way around and vulcanized to outside of boot, protects the foot from snags and hard knocks, and adds strength to the boot. No other boot made has this feature, or IRON HEELS.

VII. Stitches. The stitches that hold on the wearing sole pass through the out-turned protective strip of heavy rubber covered canvas, the out-turned upper, and the welt sole so that it is impossible to separate the welt from the upper. No other boot is made with the upper turned out over the welt and stitches passing down through the parts.

Seven Reasons of Superiority

I. Water-tight. Every pair is guaranteed to be water-tight and perfect in manufacture.

II. Durability. They will out-wear from three to five pairs of the very best quality all rubber boots, and the IRON HEELS never wear out.

III. Repairing. The wearing sole can be renewed at least twice, thus adding to service of boot. The IRON HEELS never need repairing.

IV. Comfort. The feet being in contact with the leather insole, will not draw, perspire or get sore. The IRON HEELS don't wear crooked.

V. Welt Sole. The out-turned upper, welt sole, and stitches holding on the wearing sole, extend all the way around the foot—the only boot in the world made with an out-turned upper. No nails or screws through the sole.

VI. Strength. A strip of rubber covered heavy canvas, extending one inch above the sole

HIP STYLE

Sizes 6 to 12.....list price, per pair \$14.20

FOLDING CAMP BED OR COT

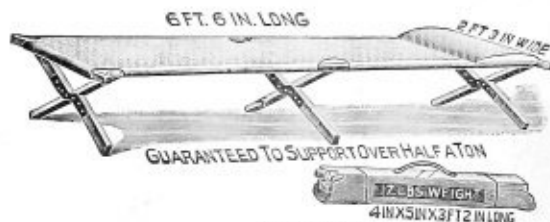


FIG. 5467

Folded, 3 feet 2 inches long, 4 inches thick, 6 inches wide. Weight 17 pounds. List priceeach \$6.66

FOLDING HOUSE COT

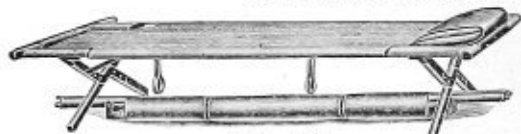


FIG. 5468

6 inches long, 2 feet 3 inches wide. The duck is 12 ounce double filled, brown, with a duck fold to keep pillow in position. It has automatic braces, etc. Folded it is 6 feet 4 inches long and about 4 inches square, and weighs 16 pounds. List price.....each \$6.00

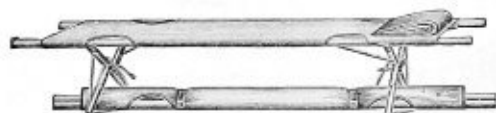
COMBINATION COT AND LITTER
OR MINE STRETCHERS

FIG. 5469

width 27 inches. It has two handles on each end and two handholes on each side. Folded it is 7 feet long by about 4 inches square. Guaranteed to support 600 pounds, and when adjusted, not to close when used as a litter. It is covered with 12 ounce duck, colored brown or drab. Weight 16 pounds. List price....each \$7.00

UNITED STATES ARMY LITTER

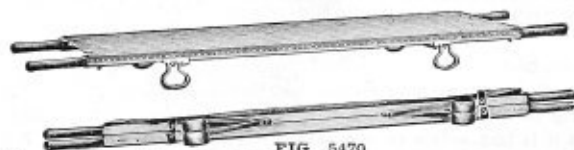


FIG. 5470

The woodwork is all air-dried white ash; the feet are malleable iron; the braces are forged steel; the duck is 12 ounce double filled khaki; all the metal parts are tinned. Length 7 feet 6 inches, width when opened 22 inches. Weight 22 pounds each.

When packed for shipment, one-half dozen occupies a space 12 by 20 inches by 7 feet 6 inches.

No 100. Price, without Slingseach \$14.00

No. 1. Is a full length, easy, comfortable bed; covered with extra good quality of 12 ounce double filled brown or white duck. Is furnished with a duck fold easily convertible into a comfortable pillow.

Dimensions: Opened, 6 feet 6 inches long, 2 feet 3 inches wide, 14 or 18 inches high.

No. 2. For an indoor cot this is of special value. It is so easily opened or folded and so comfortable that for an extra bed it has no equal. It is 14 inches high and 6 feet

No. 23. Combination Cot and Litter or Stretcher is a first-class folding cot and the best litter manufactured. It has no separate parts; can be quickly and easily folded. Its extreme length is 7 feet; the duck part is 6 feet 2 inches,

No. 100. United States Army or Government Litter is used the world over. The latest improved pattern, as adopted by the medical department of the United States Army.

WOOL BLANKETS



FIG. 5471

Regulation U. S. Army or Hospital Blanket, extra heavy. Size 66x84 inches. *

Price each \$10.00

RUBBER MINE BLANKETS

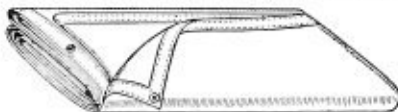


FIG. 5472

Heavy weight. Size 45x72 inches. Price.....each \$3.00

STORAGE TUBES



FIG. 5473

These tubes are made of heavy galvanized steel with capped end and with handles for hanging.

They are of sufficient capacity to store one mine stretcher, one wool blanket and one rubber blanket, together with such small First Aid Equipment as is necessary. The tube keeps the equipment dry and clean. Price.....each \$10.00

JOHNSON'S FIRST AID CABINETS

No. 1



FIG. 5474

Many thousands of these Cabinets are in use in factories, mines, camps, ships, railway and trolley lines, railway shops, schools, office buildings and other places where accidents are liable to occur.

The Cabinet is so arranged and the contents so selected that temporary aid can be rendered by any layman, and when the surgeon arrives he will find proper material for the first dressing of any conceivable injury. The dressings are simple and complete and the contents of the Cabinet are not only applicable to injuries of any nature, but are sufficient in quantity to provide for a large number at one time.

CONTENTS OF JOHNSON'S FIRST AID CABINET NO. 1

Two Johnson's "First Aid for Wounds" Packets, No. 3. Two Burn Dressing Packets, No. 22. Four packages Red Cross Absorbent Gauze, each containing one yard. Two packages Red Cross Absorbent Cotton, each containing 4 ounces. One spool Johnson's "Z O" Adhesive Plaster, 1 inch wide, 5 yards long. Six Red Cross Cotton Roller Bandages, 2 inches wide. Six Red Cross Cotton Roller Bandages, 2½ inches wide. Four Linton Gauze Bandages, 1 inch wide. Eight Linton Gauze Bandages, 2 inches wide. Six Linton Gauze Bandages, 2½ inches wide. One Tourniquet. One jar Carbolyzed Petrolatum. One bottle for Camphenol Antiseptic Solution. One bottle Camphenol. One bottle Aromatic Spirits of Ammonia. Four Wooden Splints, 3¼x18 inches. Two packages Safety Pins. One pair Scissors. One pair Tweezers. One sample Synol Soap. One Johnson's First Aid Manual. One Triangular Bandage Hanger.

Prices upon application.

CONTENTS HOUSEHOLD ACCIDENT CASE NO. 11

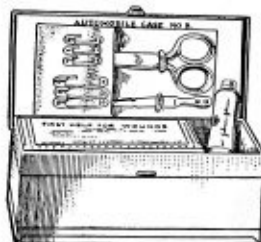


FIG. 5475

First Aid for Wounds Packet. Useful for burns, scalds, fractures, wounds and various injuries.

Red Cross Gauze, Plain. For application to wounds, for padding, etc.

Roller Bandages. Used to keep dressings in place, secure splints, to cover wounds, to check bleeding, and for innumerable other uses.

Finger Gauze Bandages.

Absorbent Lint. For application to sores, ulcers, and burns. To make compress pads.

Red Cross Absorbent Cotton. The most generally used of all first aid material for covering wounds, making compresses or padding splints.

Adhesive Plaster. For closing small wounds.

Mustard Leaves. An acceptable substitute for the home-made mustard poultice or plaster.

Carbolyzed Petrolatum. For application to scalds, burns, ulcers and old sores.

The contents of the Household Accident Case are applicable to many uses in the household, either for wounds or injuries, also for traveling purposes, for camping out, and for other uses where a small party is to be provided for. It is also suitable for any small shop or store.

The Household Accident Case is accompanied with a Handbook of First Aid, giving full directions for the use of the material contained in the case.

Prices upon application.

WOOD'S EMERGENCY ACCIDENT CASE NO. 6

Size 7x9x2½ inches

**FIG. 5476**

This case is designed for camp, automobile, launch, home or small shop, where a compact and convenient accident outfit is desired. The case is black japanned metal, hinged cover with fastener.

CONTENTS

Two First Aid for Wounds Packets. Two yards Red Cross Gauze. One ounce Cotton. Four Gauze Bandages. Two Cotton Bandages. One spool "Z O" Adhesive Plaster. One tube Carbolized Petrolatum for burns and scalds. One Tourniquet, to stop hemorrhage. One pair Scissors. One pair Tweezers. Safety Pins. One sample Toilet and Baby Powder. One sample Synol Soap. Handbook of First Aid.

Prices upon application.

AUTOMOBILE EMERGENCY CASE NO. 8

3¼x2½x7 inches

**FIG. 5477**

A small compact outfit for automobile equipment. Made of strong black metal, highly ornamental and serviceable.

CONTENTS

One First Aid for Wounds Packet. One yard Aseptic Gauze. One 2 inch Gauze Bandage. One 1 inch Cotton Bandage. One cylinder Adhesive Plaster. One tube Carbolized Petrolatum for burns. One pair Tweezers. One pair Scissors. Safety Pins.

Prices upon application.

Automobile Emergency Case No. 8 can easily be stowed away in a machine. In time of need its value cannot be overestimated. It is a necessary part of a car's equipment, as essential for a gentle electric as it is for a sixty horsepower touring car or a ten-ton truck.

No matter how careful you may be as a driver, there is always the danger of accidents. You must consider the other driver. All your skill and vigilance will not protect you from the stupid or reckless chauffeur.

FIRST AID PACKETS

A good deal of the value in First Aid work depends on the dressings used. One may know what to do in an emergency and how to do it—yet benefit the sufferer but little because surgically clean dressings are not at hand when needed.

The B & B Accident Cases supply dressings that are prepared in aseptic laboratories under the same rigid inspection as those supplied to the United States Army and Navy.



FIG. 5478

No. 3. U. S. Army Style First Aid Packet, pocket size metal case, containing two Sterile Compresses, to apply direct to wound; Safety Pins.

Prices upon application.

METAL FIRST AID PACKET NO. 24

This style of packet is favored by many mining companies because of its being waterproof and thoroughly durable.



FIG. 5479

The contents, all tightly compressed and encased within a solid, airtight metal container, consist of:

One Regulation Compress, attached to Ribbon Bandage.
One Triangular Bandage,
Safety Pins.

By pulling upon the metal ring the packet is easily divided in the center and the contents at once available.

The United States Government has purchased large quantities of the metal packet for navy and army service. For Boy Scout purposes it has no superior. Lumbermen, campers, autoists, fishermen, sportsmen and those engaged in similar outdoor pursuits also give some preference to this pattern.

The size of this packet is 4x2¼x1 inch.

Prices on application.

VICTOR 20th CENTURY IMPROVED OFFICE OUTFIT



FIG. 5480

The Victor 20th Century Improved Office Outfit is offered to meet the needs of those whose clerical duties are of a limited nature or where it is necessary to economize on floor space. It is unusually practical, as will readily be seen, and is of an attractive, serviceable design: The safe and desk are separate units and, if desired, can be used apart from each other. The desk is 48 inches long, 33 inches high and 30 inches wide, and is built of oak in a beautiful golden finish, and waxed. Special attention is called to the curtain, which is of oak, and which, when closed, acts as a complete covering to the safe, instantly converting the combination set into what appears to be a solid oak desk.

The safe outside measures 29 inches high, 18 inches wide and $19\frac{1}{2}$ inches deep, and the inside dimensions are $17\frac{1}{2}$ inches high, $12\frac{1}{2}$ inches wide and $13\frac{1}{4}$ inches deep.

The door is operated with heavy bolt system, and is checked by a four-tumbler combination lock. The exterior of safe is beautifully finished in black, and the interior in hardwood. The safe is of a very convenient size and will accommodate quite a large set of books, in addition to valuable papers, etc. The chair is of the swivel type, and finished to match desk.

The safe, desk and chair are of the very highest standard construction.

DESK DIMENSIONS

Length 48 inches, height 33 inches, width 30 inches.

The desk is constructed with a patented roll dust-proof oak curtain on side. One drawer with good key lock. Desk finished in golden oak, wax finish.

List price\$20.00

SAFE DIMENSIONS

Outside: Height 29 inches, width 18 inches, depth $19\frac{1}{2}$ inches. Inside: Height $17\frac{1}{2}$ inches, width $12\frac{1}{2}$ inches, depth $13\frac{1}{4}$ inches.

Safe finished in black. Bolts operated with four-tumbler combination lock. Approximate shipping weight 300 pounds.

List price\$40.00

CHAIR

Of swivel type, highest standard construction. Finished in golden oak, wax finish.

List price\$12.00

HERCULES NEW GEM STEP LADDER

Made from clear, straight grained yellow pine with front legs $2\frac{1}{2}$ inches wide and steps $3\frac{3}{4}$ inches wide, with head step 6 inches wide by 16 inches long.

It is a high grade ladder, single head block is riveted to cap front and back legs, slotted sides, iron rod under every step, equipped with new pail rest, hinge self-locking, which strengthens pail rest.

Priceper foot \$0.34



FIG. 5481

HERCULES EXTENSION LADDER



FIG. 5482



Above Cut Shows Malleable Ladder Lock

This Extension Ladder is made from clear, straight grained spruce. Castings on same of malleable iron and rounds of clear, straight grained ash and hickory, the rounds being tenoned and inserted in rails and held by nails to prevent spreading. These ladders are light and strong and weigh two pounds to each foot of length.

In ordering, always give length and number. Unless otherwise ordered, ladders shipped as specified.

No. 42. 18 inches wide outside, side rail bottom section $1\frac{1}{8} \times 3\frac{1}{4}$, top section $1\frac{1}{8} \times 2\frac{3}{4}$.

Price per single foot up to 32 feet, \$0.30; 34 to 40 feet,\$0.38

No. 42½. 20 inches wide outside, side rail top and bottom section $1\frac{1}{8} \times 3\frac{1}{4}$.

Price per single foot up to 32 feet, \$0.32; 34 to 40 feet,\$0.40

No. 43. 23 inches wide outside, side rail bottom section $1\frac{1}{8} \times 3\frac{1}{4}$, top section $1\frac{1}{8} \times 3\frac{1}{4}$.

Price per single foot up to 32 feet, \$0.33; 34 to 40 feet,\$0.42

Price includes rope and pulley. If windlass is wanted note same on order. Price additional, per foot,\$0.02

If No. 42 is wanted with same side rails as No. 42½ and No. 43 price will be same as these numbers.

HERCULES SINGLE LADDERS

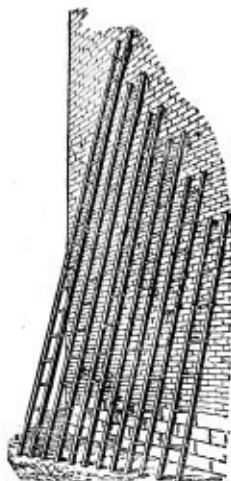


FIG. 5483

These Ladders are made with strictly clear and well seasoned spruce rails and ash and hickory rungs (rounds) and are light in weight, but stiff and strong. We solicit inquiries for special sizes and are well equipped to furnish extra long lengths.

No. 1. 13 feet and under, $1\frac{1}{8} \times 2\frac{1}{2}$ in. rail. Price.....per foot \$0.20

No. 2. 16 feet and under, $1\frac{1}{8} \times 2\frac{3}{4}$ in. rail. Price.....per foot .22

No. 3. 16 foot to 20 foot $1\frac{1}{8} \times 3\frac{1}{4}$ inch rail. Priceper foot .24

For ladders made with $1\frac{1}{8} \times 3\frac{3}{4}$ in. rail, add 2c per foot.

Mark number on order as same indicates size of side rail desired.

No. 644-A. SINGLE DRAY HARNESS

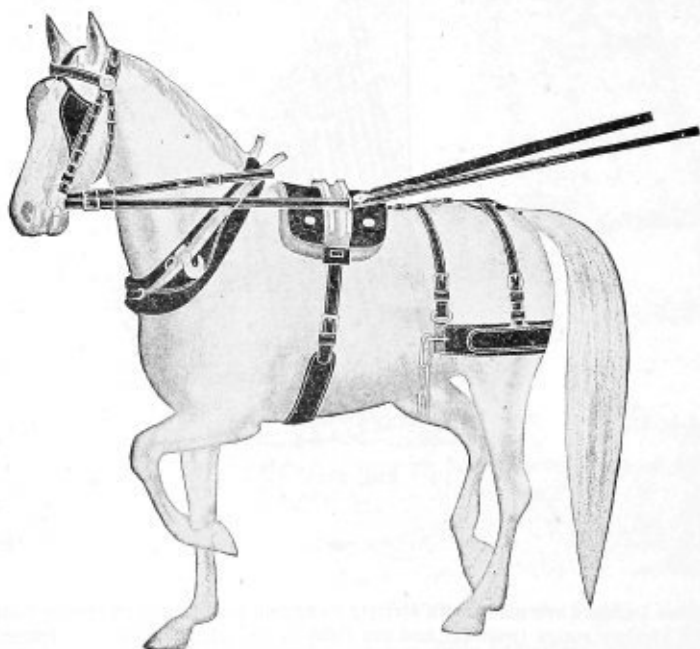


FIG. 5484

CAMPBELL LOCK-STITCHED THROUGHOUT

BRIDLE— $\frac{3}{8}$ -inch, pigeon wing blinds, flat reins.

LINES— $\frac{7}{8}$ -inch, flat, black, buckle billets.

HAMES—Farmer's strap, red bronze top.

SADDLE—No. 2, single cover.

BELLY BANDS—Flat, single strap.

BREECHING—3 inches, with 2-inch layer, $1\frac{1}{4}$ -inch kidney straps, $1\frac{1}{2}$ -inch turnback.

No. 732-A. TEAM HARNESS

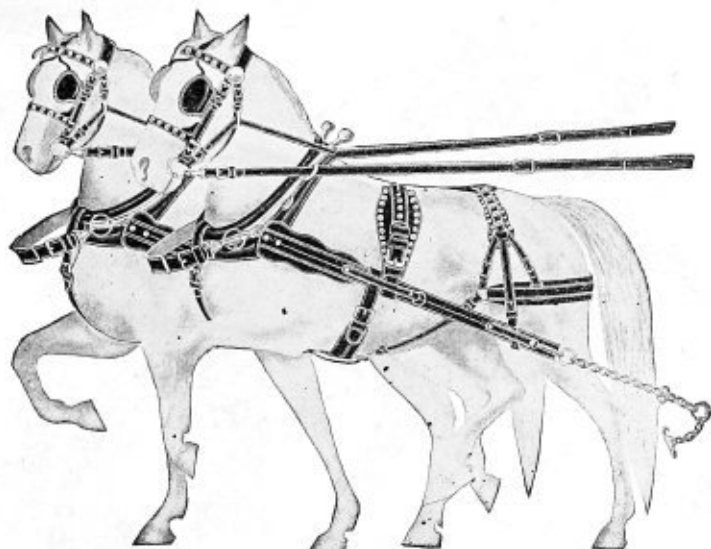


FIG. 5486

CAMPBELL LOCK-STITCHED THROUGHOUT

BRIDLES— $\frac{7}{8}$ -inch, doubled and stitched cheeks, harness leather blinds, round stay, flat rein, spotted nose band and front.

LINES—1-inch x 18 feet, all black, buckle end.

HAMES—No. 920, Chicago brass ball, all steel.

TRACES— $1\frac{3}{4}$ -inch or 2-inch x $4\frac{1}{2}$ feet, doubled and stitched, three row, $3\frac{1}{2}$ -10-2 chains attached.

BELLY BANDS—Folded and stitched.

BACK BANDS—Fancy swell style, spotted, $1\frac{1}{2}$ -inch layer and billet, doubled and stitched body.

CHOKE STRAPS— $1\frac{1}{2}$ -inch, single strap.

BREAST STRAPS—No. 1, $1\frac{1}{2}$ -inch, double and stitched, snap and slides.

BREECHING—Folded and stitched with layer, fancy spotted safe on upper hip strap, $\frac{7}{8}$ -inch lower hip strap, $1\frac{1}{2}$ -inch single turnback, 1-inch side strap.

TRIMMINGS—Japan, part brass.

No. 706-A. TEAM BREECHING HARNESS

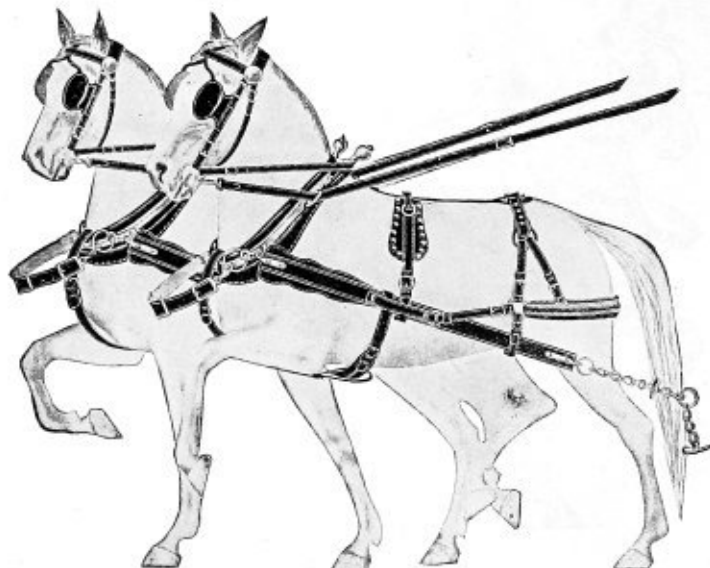


FIG. 5485

CAMPBELL LOCK-STITCHED THROUGHOUT

BRIDLES— $\frac{3}{8}$ -inch, doubled and stitched cheeks, harness leather blinds, flat stay and reins.

LINES—1-inch x 18 feet, all black, snap end.

HAMES—No. 91, XC red wood style ball top.

TRACES—2-inch x $4\frac{1}{2}$ foot, with safe, three rows stitching, $3\frac{1}{2}$ -10-2 chains attached.

BACK BANDS—Swell housings, felt lined, $1\frac{1}{2}$ -inch billet and layer.

BELLY BANDS— $1\frac{1}{2}$ -inch, single strap.

CHOKE STRAPS— $1\frac{1}{2}$ -inch, single strap.

BREAST STRAPS—No. 1, $1\frac{1}{2}$ -inch, doubled and stitched, snap and slides.

BREECHING—Folded and stitched, with layer, $\frac{3}{8}$ -inch lower hip strap, $1\frac{1}{2}$ -inch upper hip strap, $1\frac{1}{4}$ -inch turnback.

TRIMMINGS—Japan.

HARNESS BANDS, SNAPS, ETC.

Plow Belly Band



FIG. 5487

Plow Back Band



FIG. 5488

No. 1 Breast Snap



FIG. 5489

PLOW BELLY BAND

Made in sizes $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$, 2 and $2\frac{1}{2}$ -inch.

PLOW BACK BAND

With turnback loops riveted and chain eyes sewed and riveted. Sizes 3, $3\frac{1}{2}$, 4, 5 and 6-inch.

NO. 1-BREAST SNAPS

$1\frac{1}{2}$ -inch, with snaps and buckles and slides, doubled and stitched.

No. 70
Stage
Choke
Strap

Bell Collar

Check Lines



FIG. 5490



FIG. 5491



FIG. 5492

NO. 70-STAGE CHOKE STRAPS

Sizes $\frac{7}{8}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$ and 2-inch.

BELL COLLARS

Sizes $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$ and 2-inch, with Japan buckles.

CHECK LINES

$\frac{7}{8}$ -inch x 16 feet.
1-inch x 18 feet.

1-inch x 16 feet.
1-inch x 20 feet.

$\frac{7}{8}$ -inch x 18 feet.
1-inch x 22 feet.

Trace Piping



FIG. 5493

TRACE PIPING

Made with double and stitched end. Sizes 30, 36 and 42-inch.

HARNESS, BRIDLES, STRAPS AND HALTERS

No. 1—P. W.
Blind Bridle

FIG. 5494

NO. 1—P. W. BLIND BRIDLE
Solid crown, flat stays, P. W. blinds, buckle in bit.
Sizes $\frac{7}{8}$ and 1-inch, trimmings Japan.

NO. 16—BUGGY AND TEAM HAME STRAPS



FIG. 5495

Sizes $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, $1\frac{1}{8}$ and $1\frac{1}{4}$ -inch, riveted, creased,
Japan buckles, Union loops.

NO. 17—SEWED TEAM HAME STRAPS



FIG. 5496

Sizes $\frac{3}{4}$, $\frac{7}{8}$, 1, $1\frac{1}{8}$ and $1\frac{1}{4}$ -inch, 21 to 30 inches long,
Japan buckles.

NO. 18—JONES HAME STRAPS



FIG. 5497

Sizes $\frac{7}{8}$ and 1-inch, 22 inches long.

Yoke or
Pole Strap

FIG. 5498

NO. 57—YOKE OR POLE STRAPS
Sizes $1\frac{1}{4}$ and $1\frac{1}{2}$ -inch; trimmings XC and Japan.

NO. 30—FIVE-RING HALTER
Machine sewed. Size $1\frac{1}{4}$ -inch, with ties.

Halter

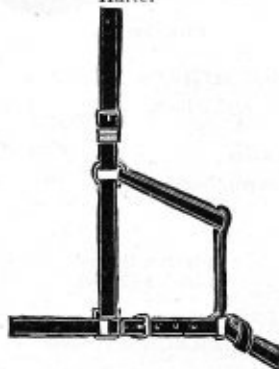


FIG. 5499

Mine Spider



FIG. 5500

OHIO MINE SPIDER

Made in two sizes, $1\frac{1}{2}$ and $1\frac{3}{4}$ -inch, Campbell lock-stitched.

CART SADDLES, BREECHING, ETC.

Cart Saddle



FIG. 5501

Cart Breeching

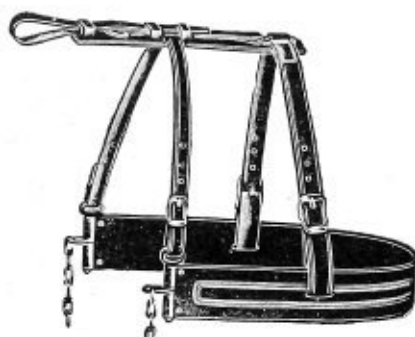


FIG. 5502

NO. 2—CART SADDLE

Single cover, iron end tree, leather bottom stuffed pad with wide girths. Nos. 2 and 3 cart saddles also made with square ticking, faced pads.

Langhorne type, without housings, can be supplied.

CART BREECHING

3-inch with stitched layer. 3½-inch with stitched layer. 4-inch with stitched layer.

Wagon Breeching



FIG. 5503

Stage Breeching



FIG. 5504

NO. 1—FLAT WAGON BREECHING

Size 2½-inch, sewed and riveted.

Size 3-inch, sewed and riveted.

Size 3½-inch, sewed and riveted.

NO. 10—STAGE BREECHING

Sizes ¾, 1 and 1½-inch.

THE HIABGO HORSE COLLAR
FOR TEAMING, TRUCKING AND GENERAL FARM WORK

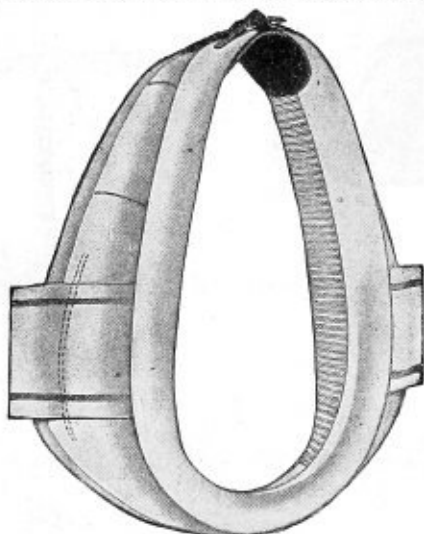


FIG. 5505

HIABGO Collars are made entirely of fabric of the highest grade obtainable. They have five times the strength of the ordinary kind, and the equal of the best leather.

HIABGO Collars can be used for any service or under any conditions where any other collar is used, and are absolutely guaranteed by the manufacturer.

HIABGO Collars require no breaking in. Being flexible, they are at once adjustable to the shape of the animal's neck.

HIABGO Collars are provided with a Patented Inside Steel Stiffening Spring, found in no other. By its use the rim is rigid around the turn to the point of the draft and flexible to the top, which prevents the hames from slipping off.

HIABGO Collars are made with greatest care and to withstand hard use. All the seams are sewed with seven cord thread. The points of wear reinforced with 50 ounce fabric.

HIABGO Collars are stuffed with clean, sanitary straw. The rims and back stuffing entirely with long rye straw, which will not separate or run out.

HIABGO Collars can be sold for less than half the price of those made of a good quality of leather.

HIABGO Collars should fit snug to the neck of the animal all the way around, allowing about half inch play at the throat. If the Collar is too wide press it together, and if too narrow pull it apart. After being fitted, carefully adjust hames to hold the collar in its proper shape.

List price per dozen \$28.50

HORSE BRUSHES

LEATHER BACK, TAMPICO AND BRISTLE

No. 3000. Body Brush



FIG. 5511

No. 3000. Red back, grey center,
white border.....per dozen \$6.00

No. 367. Body Brush



FIG. 5513

No. 367. Black back, black center,
black bristle edge, good medium brush.
.....per dozen \$13.20

No. 11. No Side Straps



FIG. 5514

No. 11. Oval varnished back, African
fiber.....per dozen \$6.00

No. 500. Bristle Body Brush



FIG. 5512

Our No. 500 is a big value and a good
seller. Try a few of them.

No. 500. Olive, flexible back, black
Chinese pure bristle; you will find good
value in this brush for the money.
.....per dozen \$27.00

No. 50. Dandy



FIG. 5515

No. 50. Flat varnished back, with
straps, selected Palmetto fiber.....
.....per dozen \$6.00

CURRY COMBS

No. 82. The King of all Curry Combs



FIG. 5516

No. 82. Lacquered, 8 bars, close back,
extra strong. The king of the lot. Ex-
tra heavy wrought steel shank and
brace, highly polished, best cold rolled
steel, black enameled handle, brass fer-
rule.....per dozen \$4.50

No. 28



FIG. 5517

No. 28. Our big value 8 bar solid back
Curry Comb. Solid steel shank running
through the handle and riveted. Made
from cold rolled steel, pressed steel
shank and knockers, lacquered finish.
.....per dozen \$3.60

STANDARD HARNESS BUCKLES

NO. 50 BARREL ROLLER BUCKLES

Priceper doz. \$.....



FIG. 5518

"ANCHOR BRAND" BOLT SNAPS

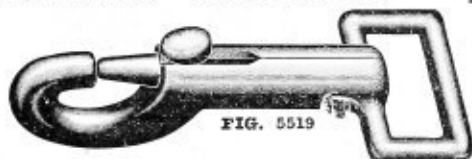


FIG. 5519

No. 15. Loop Eye. Sizes $\frac{1}{2}$ to 2 inch. Finishes, X. C. Plate, Hard Rubber Finish.

LOXPRING BREAST STRAP ROLLER SNAPS

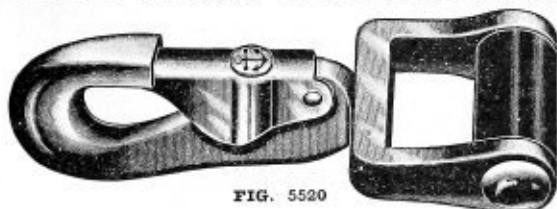


FIG. 5520

No. 85. Polished, X. C. Plate or Hard Rubber Finish.
Sizes, $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$, 2.NOS. 254 AND 254X **QUICK-KLOZE** HINGED OPEN

EYE BOLT SNAPS



FIG. 5521



Above Shows Eye Opened

Sizes of eye.....	inch	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$
Length over all.....	inches	$3\frac{1}{2}$	4	$4\frac{3}{4}$
No. 254. X. C. Plate.....	per gross	\$6.20	11.75	20.00
No. 254. Hard Rubber Finish—Gilt Bolt.....	per gross			
Size of eye.....	inch			$\frac{5}{8}$
Length over all.....	inches			$5\frac{1}{2}$
No. 254X. X. C. Plate.....	per dozen	\$3.12		
No. 254X. Hard Rubber Finish—Gilt Bolt.....	per dozen	3.12		

CORNER MANGERS OR FEED BOXES WITH FLAT FOOD GUARD

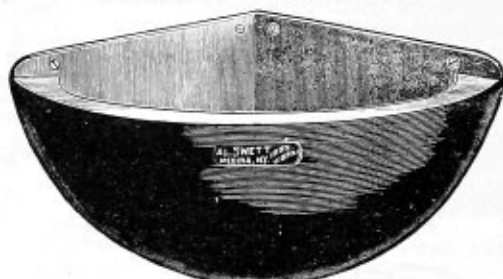


FIG. 5523
WITH ROLL FRONT FOOD GUARD

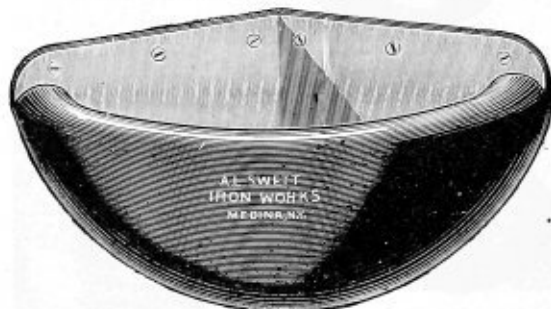


FIG. 5524

With Flat Food Guard		With Roll Front Food Guard	
No. 1—13x13x8	per doz. \$18.00	No. 5—15½x15½x9	per doz. \$21.25
No. 2—15½x15½x9	per doz. 19.00	No. 6—17x17x10	per doz. 22.50
No. 3—17x17x10	per doz. 20.00	No. 7—18x18x10, extra heavy...	per doz. 27.50
No. 4—18x18x10, extra heavy...	per doz. 25.00	No. 7½—20x20x12	per doz. 40.00



FIG. 5525

WROUGHT IRON HAY RACKS

No. 12. Frame, 1 inch channel. Uprights ½ inch round bar. Exceptionally strong and rigid. Priceper doz. \$30.00

No. 13. Same as above but with 6 bars instead of 8. Priceper doz. \$26.00

Projects from corner 2 ft.; height, 2 ft. 6 in.

USEFUL INFORMATION

STEAM BOILERS

May be classed under two heads, as all are, without exception, either fired externally or internally. The relative economy of the two systems is largely determined by the *furnace construction*, plus or minus the loss of heat by radiation in the same.

The loss in boilers fired *externally* consists in the radiation of heat through the brick setting, while in boilers fired *internally* the fuel is consumed in close contact with the furnace sheets which are a component part of the boiler structure, and as the heat is transmitted directly to the water which surrounds the furnace, the loss by wasteful radiation is comparatively small. Hence, practice bears out the statement of Stephen Roper, the eminent engineer, that the *internally fired* is the most economical type, and that such a boiler will save its cost in *less* than its reasonable life.

BOILER HORSE-POWER

Conditions modify all calculations in determining the horse-power of a boiler, such as design, quality of the material of which it is made, facilities for cleaning, impurities in the water, calorific power of fuel used, attendance, and draught of chimney, etc.

Moreover, no dogmatic set of rules will insure satisfactory results in every case of boiler construction, as the factors of grate and heating surface, temperature of feed water, proper control of air to support combustion, steam and water space, circulation of water within the boiler, all vary with each type of boiler used, and even with different proportions in the same type. Hence this article is only intended to give an approximate statement of the case as shown in existing formulas.

Approximately, the horse-power, if *externally fired*, may be calculated by multiplying in inches $\frac{2}{3}$ of the circumference of the shell by its length, then multiply the product of the area of all the flues or tubes by their length, add these products together and divide by 144 to find square feet, then divide this quotient by 14. 144 represents the square feet of heating surface in the shell, tube and flues, and 14 the square feet of heating surface usually allowed per horse-power.

For *internally fired* boilers multiply in inches the circumference or square of furnace by its height, then multiply the circumference of one tube by its length, and this product by the entire number of tubes, taking into account also the square inches of surface presented by the crown or tube sheet. Add these quantities together and divide by 144, the quotient will be the heating surface in square feet, and this, when divided by 14, the last quotient will be the horse-power.

With a good draught for the furnace, 10 square feet of heating surface, $\frac{1}{2}$ a square foot of grate surface, 8 lbs. of good coal and 1 cubic foot of water evaporated per hour may be estimated for each nominal horse-power that the boiler should develop.

FOR CYLINDRICAL BOILERS

Each nominal horse-power requires 1 cubic yard capacity, 1 square yard of heating surface, 1 square foot of grate bar surface, 1 cubic foot of water evaporated per hour and 28 square inches of flue area, the area for entrance of air to ash pit should be $\frac{1}{4}$ of area of grate, depth of ash pit, 1 foot 6 inches to 2 feet 6 inches.

The *grate-bars* should incline downwards towards the *front*, 1 inch per foot; not over $\frac{3}{4}$ inch thick and $\frac{3}{8}$ to $\frac{7}{16}$ inch spaces between.

The *furnace* should have at least 3 cubic feet of space above each square foot of grate surface.

FOR HORIZONTAL TUBULAR BOILERS

The length of tubes should be 48 times the diameter. For soft coal 4 inch diameter gives the best results, with 1 inch space between the tubes, and $2\frac{1}{2}$ inch space between tubes and shell of boiler. Tubes should be set in vertical rows to facilitate cleaning.

USEFUL INFORMATION

OTHER RULES FOR CALCULATING BOILER HORSE-POWER

CONDENSED FROM WAKEMAN

UNDER FAVORABLE CONDITIONS.—A flue boiler will evaporate 2 lbs. of water per hour per square foot of heating surface. Now, as the evaporation of 30 lbs. of water per hour into steam of 70 lbs. gauge pressure, when feed water has a temperature of 100° F., constitutes a horse-power, then each 15 square feet of heating surface in this type of boiler, with good coal and good draft, will generate a horse-power.

Tubular and water tube boilers can be made to furnish a horse-power for each 12 feet of heating surface. Locomotive boilers will develop 1 horse-power for each 18 square feet of heating surface. Under average conditions, with feed water at 100° F. and steam at 70 lbs. gauge pressure, and 3,000 lbs. of water be evaporated in one hour in any boiler above mentioned, then $3,000 \div 30 = 100$ horse-power developed by that boiler. In actual practice, however, the conditions must be reduced to the standard above given, as follows:

Rule.—Multiply the total heat of steam at pressure carried (minus temperature of feed water) by the lbs. of water evaporated per hour and $\div$ by 1,100 (British thermal unit), the quotient will be the lbs. of water evaporated with feed water at 100° F., and a steam pressure of 70 lbs. Now $\div$ again by 30 = the horse-power developed.

Problem.—The steam pressure being 90 lbs. and feed water 210° F., and 3,400 lbs. of water being evaporated per hour, what is the horse-power? Referring to steam table, we find that 90 lbs. gauge pressure (or 105 lbs. absolute pressure) contains 1,182° above 32° or $1,182 + 32 = 1,214$. Then $1,214$ minus $210 = 1,004$, and $1,004 \times 3,400 = 3,413,600$. This $\div 1,100 = 3,075$ lbs., which would have been evaporated under standard conditions with the same amount of heat, and $3,075 \div 30 = 102$ horse-power developed.

CHIMNEYS—TABLE OF CHIMNEYS AND H.P. OF BOILERS TO BE USED WITH THEM

Int. diam. chimney, in...	18	18	18	21	21	21	24	24	24	27	27	27	...	...
Height of chimney, ft...	50	60	70	50	60	70	50	60	70	50	60	70	...	...
Horse power of boiler...	23	25	27	35	38	41	49	54	58	65	72	78	...	...
Int. diam. chimney, in...	30	30	30	33	33	33	36	36	36	36	39	39	39	39
Height of chimney, ft...	50	60	70	60	70	80	60	70	80	90	70	80	90	100
Horse power of boiler...	84	92	100	115	125	133	141	152	163	173	183	196	208	219
Int. diam. chimney, in...	42	42	42	42	48	48	48	54	54	54	54	54	54	...
Height of chimney, ft...	80	90	100	110	80	90	100	110	90	100	110	125	150	...
Horse power of boiler...	231	245	268	271	311	330	348	389	427	449	472	503	551	...
Int. diam. chimney, in...	60	60	60	60	66	66	66	66	72	72	72	72	72	...
Height of chimney, ft...	109	110	125	150	110	125	150	175	125	150	175	200	...	...
Horse power of boiler...	565	593	632	692	728	776	850	918	934	1023	1105	1181	...	...

ENGINE HORSE-POWER

All calculations to find the horse-power of an engine are necessarily only approximate, as they are modified more or less by the factors of friction in the moving parts, loss of steam at the joints and valves, condensation, quality of lubrications, amount of load, etc.

The unit of power is the horse-power, and was first calculated by Watt, that prince of inventors in steam enginery; and after numerous experiments Watt estimated the power of a good, average draught horse to be that which could lift 33,000 lbs. one foot high in a minute, 550 lbs. in one second, or 1,980,000 lbs. in an hour. Hence we have the horse-power factor, 33,000 lbs.

USEFUL INFORMATION

RULES AND TABLES

$$H. P. = \frac{P \cdot L \cdot A \cdot N}{33,000}$$

P—POUNDS PRESSURE PER SQUARE INCH

L—LENGTH OF STROKE IN FEET

A—AREA OF PISTON IN SQUARE INCHES

N—NUMBER REVOLUTIONS PER MINUTE

HORSE-POWER

Horse-power is an amount of mechanical force capable of raising 33,000 pounds one foot high, per minute.

RULE TO FIND HORSE-POWER OF AN ENGINE

Area of piston in inches, multiply by pressure per square inch, multiply by speed of piston in feet per minute, and that product divided by 33,000.

The pressure per square inch should be the mean pressure throughout the stroke exerted on the piston, which can be found by attaching an indicator to the engine. The result will be what engineers term, indicated horse-power.

For the net effective horse-power, deduct from the above about one-quarter for friction of the working parts.

When the indicator is not used, and in the calculation the boiler pressure is substituted for the mean effective pressure, deduct from the result obtained from 40 to 60 per cent for loss by condensation and friction of steam in pipes and passages, decrease of pressure in cylinder due to expansion, back pressure of exhaust, and friction of the working parts.

For engines from 20 to 60 horse-power, an average of 50 per cent may be deducted; for smaller engines more.

The mean pressure in the cylinder when cutting of at

$\frac{1}{4}$ stroke equals boiler pressure multiplied by .597
$\frac{1}{3}$ stroke equals boiler pressure multiplied by .670
$\frac{1}{2}$ stroke equals boiler pressure multiplied by .743
$\frac{2}{3}$ stroke equals boiler pressure multiplied by .847
$\frac{3}{4}$ stroke equals boiler pressure multiplied by .919
$\frac{7}{8}$ stroke equals boiler pressure multiplied by .937
$\frac{9}{10}$ stroke equals boiler pressure multiplied by .966
$\frac{11}{12}$ stroke equals boiler pressure multiplied by .992

The horse-power of boilers is best defined by the heating surface of a boiler and is different according to their construction. A tubular boiler will give one horse-power to every 15 square feet of heating surface; a flue boiler every 12 square feet, and a cylinder boiler 10 square feet gives one horse-power. There is no standard law governing the horse-power of steam boilers, but this rule is adopted by most experts as a fair rating.

One cubic foot of water evaporated per hour = 1 nominal horse-power.

$7\frac{1}{2}$ pounds of coal consumed per hour will evaporate 1 cubic foot of water = 1 horse-power.

1 square foot of grate will consume on average 12 pounds of coal per hour = 1.5 horse-power.

A theoretically perfect steam engine consumes 33.50 pounds of coal per hour, per horse-power.

Marine condensing engines consume 2 to 6 pounds of coal per horse-power.

FUEL

1 pound of coal will evaporate from 7 to 10 pounds of water.

1 pound dry pine wood will evaporate from 4 to 5 pounds of water.

1 ton of anthracite coal requires a space of 43 cubic feet.

1 ton of bituminous coal requires a space of 44 cubic feet.

1 ton of coke requires a space of 80 cubic feet.

150.35 cubic feet of air are required for the combustion of 1 pound of coal.

USEFUL INFORMATION

TABLE SHOWING SAFE WORKING STEAM PRESSURE FOR IRON BOILERS OF DIFFERENT SIZES, USING A FACTOR OF SAFETY OF SIX

Internal Diam. of Shell in Inches	Thickness of Iron, Inches	Longitudinal Seams, Single Riveted			Longitudinal Seams, Double Riveted		
		Tensile Strength of Iron			Tensile Strength of Iron		
		45,000 Lbs. Pressure, Pounds	50,000 Lbs. Pressure, Pounds	55,000 Lbs. Pressure, Pounds	45,000 Lbs. Pressure, Pounds	50,000 Lbs. Pressure, Pounds	55,000 Lbs. Pressure, Pounds
36	$\frac{1}{4}$	104	116	127	125	139	152
	$\frac{3}{8}$	130	145	159	156	174	191
38	$\frac{1}{4}$	99	110	121	119	132	145
	$\frac{3}{8}$	123	137	151	148	164	181
40	$\frac{1}{4}$	94	104	115	113	125	138
	$\frac{3}{8}$	117	130	143	140	156	172
42	$\frac{1}{4}$	89	99	109	107	119	131
	$\frac{3}{8}$	112	124	136	134	149	163
44	$\frac{1}{4}$	85	95	104	102	114	125
	$\frac{3}{8}$	107	118	130	128	142	156
46	$\frac{1}{4}$	83	91	100	98	109	120
	$\frac{3}{8}$	102	113	125	122	136	150
48	$\frac{1}{4}$	78	87	95	94	104	115
	$\frac{3}{8}$	98	109	120	118	131	144
50	$\frac{1}{4}$	118	131	144	142	157	173
	$\frac{3}{8}$	75	83	92	90	100	110
	$\frac{1}{2}$	94	104	115	113	125	138
52	$\frac{1}{4}$	112	125	138	131	150	166
	$\frac{3}{8}$	72	80	88	86	96	106
	$\frac{1}{2}$	106	120	132	108	120	132
54	$\frac{1}{4}$	87	96	106	101	112	122
	$\frac{3}{8}$	104	116	127	120	134	148
	$\frac{1}{2}$	121	135	148	140	156	172
56	$\frac{1}{4}$	78	87	95	94	104	114
	$\frac{3}{8}$	94	104	115	113	125	138
	$\frac{1}{2}$	109	121	134	131	145	160
60	$\frac{1}{4}$	85	95	104	102	114	125
	$\frac{3}{8}$	111	121	131	129	144	156
	$\frac{1}{2}$	112	124	136	137	152	167
66	$\frac{1}{4}$	78	87	95	94	105	115
	$\frac{3}{8}$	91	102	112	110	122	134
	$\frac{1}{2}$	102	117	128	125	140	153

CYLINDRICAL FLUE BOILERS

Each nominal horse-power requires:

- 1 cubic yard capacity.
- 1 square yard of heating surface.
- 1 square foot of fire-grate surface.
- 1 cubic foot of water per hour.
- 28 square inches flue area.
- G = Fire-grate surface in square feet.
- H = Nominal horse-power.
- S = Heating surface in square yards.

$$\sqrt{SG} = H. \quad \frac{H^2}{G} = S. \quad \frac{H^2}{S} = G.$$

For cylindrical two-flued boilers an approximate rule is, length $\times$ diam. $\div 6$ = nominal horse-power.

TUBULAR BOILERS

Each nominal horse-power requires:

- 8 cubic feet total boiler capacity.
- 2 cubic feet steam room.
- 10 square feet of heating surface--the whole tube surface being taken as effective.
- $\frac{1}{2}$ square foot of fire-grate surface.
- 1 cubic foot of water per hour.
- 10 square inches sectional area of tubes.
- 13 square inches flue area.
- 6 square inches chimney area.
- Diameter of tubes $\frac{1}{30}$ th of their length.

AREA OF CHIMNEYS

Q = Quantity of coal consumed per hour in pounds.

H = Height of chimney in feet.

P = Indicated horse-power.

A = Area of chimney at top in square inches.

$$A = \frac{15Q}{\sqrt{H}} = \frac{150P}{\sqrt{H}}$$

The area for entrance of air to ashpit should be $\frac{1}{4}$ the area of grate. 2 feet 6 inches is sufficient depth.

The grate bars inclining downward 1 inch per foot, not more than $\frac{3}{4}$ inch thick, and $\frac{1}{2}$ to $\frac{3}{4}$ inch spaces between.

The furnace should have 3 cubic feet of space above each superficial foot of grate-bar surface.

USEFUL INFORMATION

FORMULAE FOR CALCULATING PUMP PROBLEMS

1. Diameter multiplied by 3.1416 = Circumference.
2. Circumference multiplied by .3183 = Diameter.
3. The square of the diameter multiplied by .7854 = Area.
4. A gallon of fresh water weighs $8\frac{1}{8}$ lbs. and contains 231 cubic inches.
5. A cubic foot of water weighs $62\frac{1}{2}$ lbs. and contains 1,736 cubic inches, or $7\frac{1}{2}$ gallons.
6. A cubic foot per second equals 450 gallons per minute.
7. An acre-foot is 325,829 gallons per minute.
8. The term "miner's inch" of water is more or less indefinite, but is approximately equal to a flow of $11\frac{1}{4}$ gallons per minute. This varies in different States from about 9 to 13 gallons per minute.

9. To find the diameter of a pump cylinder required to move a given quantity of water per minute, the piston travel being 100 feet per minute, divide the number of gallons, by four, then extract the square root and the result will be the diameter in inches.

10. To find the area of required pipe, the volume of water being known, multiply the number of cubic feet of water by 144 and divide the product by the velocity in feet per minute. This gives the area of pipe, from which it is easy to determine the diameter.

11. To find the velocity in feet per minute necessary to discharge a given volume of water in a given time, multiply the number of cubic feet of water by 144 and divide the product by the area of the pipe in inches.

12. With steam pumps the area of the steam piston multiplied by the steam pressure gives the total amount of pressure exerted. The area of the water piston multiplied by the pressure of water per square inch gives the resistance. A margin must be made between the power and resistance to move the pistons at the required speed, usually reckoned at from 25 to 40 per cent.

D = Diameter of cylinder in inches.

G = Quantity in gallons per minute.

S = Length of stroke in inches.

H = Height water is elevated in feet.

N = Total number of strokes per minute.

A = Area of cylinder in square inches.

Area of cylinder in square inches = $D^2 \times .7854$

Capacity of pump per stroke in cubic inches = $S \times A$

Capacity of pump per stroke in gallons = $\frac{S \times A}{231}$

Capacity of pump per stroke in cubic feet = $\frac{S \times A}{1728}$

Capacity of pump per stroke in pounds = $\frac{S \times A \times 8\frac{1}{8}}{231}$

Capacity of pump per minute in cubic inches = $\frac{S \times N \times A}{S \times N \times A}$

Capacity of pump per minute in gallons (G) = $\frac{S \times N \times A}{231}$

Capacity of pump per minute in cubic feet = $\frac{S \times N \times A}{1728}$

Pressure per square inch in pounds of a column of water = $H \times .434$

Horse-power required to elevate a given quantity of water } $\frac{G \times H \times 8\frac{1}{8}}{33000}$
per minute to a given height, not allowing for friction }

In figuring the actual horse-power required to operate a pump, the "friction head" should be added to the "actual head" or elevation.

Using the above formula and including the "friction head," will give the theoretical horse-power. To figure the actual horse-power required it is necessary to know the efficiency of the pump. To illustrate:

If the efficiency of a small pump is 33 $\frac{1}{3}$ %, the actual horse-power required is three times the theoretical.

If the efficiency is 50%, the actual horse-power is double the theoretical.

If the efficiency is 66 $\frac{2}{3}$ %, the actual horse-power is $1\frac{1}{2}$ times the theoretical, etc.

USEFUL INFORMATION—CONTINUED

DIRECTIONS FOR SETTING AND OPERATING STEAM PUMPS

We recommend it as being more durable to place pump on a foundation, in preference to a wooden floor, as the latter is liable to rot in time and bring an undue strain on the pipes, and thus cause leaky joints.

Hard-burned brick laid in cement mortar makes best foundation for larger pumps.

Never use pipes of less diameter than given in the tables. Where long pipes are used it is necessary to increase the size to allow for the increased friction. Especially must this be observed in suction pipes. A foot valve and strainer should be attached to suction pipe. All pipes should be as short and straight as possible.

Use few elbows, T's and valves, substituting full round bends for elbows, and Y's for T's, as sharp bends greatly increase the friction. Care must be taken to guard against leaks in suction pipe, as a very small leak will supply the pump with air to its full capacity, so that little or no water will be obtained, according to size of leak.

A suction air chamber (made of a short nipple, a T, a piece of pipe of a diameter not less than the suction pipe, and from two to three feet long, and a cap screwed upright into the suction pipe, close to the pump) is always useful; and where the suction pipe is long, in high lifts, or when the pump is running at high speed, it is a positive necessity. Their utility consists in causing a steady and uniform flow of water through suction pipe, and thus preventing "pounding or water hammering," which, without one, is always incident in long suction.

Water at high temperature cannot be raised any considerable distance by suction as the vapor discharged from the water so heated follows the receding piston of the pump and resists the entrance of the water, consequently, to pump hot water, always place the supply above the pump, so that it will be supplied from a head.

Use good cylinder oil only, and oil steam end, just before stopping the pump.

Keep stuffing boxes full of good packing, well oiled, and just tight enough to prevent leakage without excessive friction.

If the pump runs badly, make sure that the water valves and water pipes are all right before examining the steam end.

In cold weather open all cocks and drain plugs to prevent freezing when the pump is not in use.

Always see that the pump has a full and steady supply of water or other fluid.

Let the steam end alone, if the pump begins to run badly, until fully satisfied that there is no obstruction in the water cylinder, water valves or water pipes.

Don't pull the pump apart to see what is inside, as long as it does its work well.

Use a pump well and carefully, if it is expected to WORK WELL.

TABLE OF CAPACITY OF PUMP CYLINDERS

Diameter of Cylinder, Inches	Length of Stroke in Inches															Diameter of Cylinder, Inches
	Capacity per Stroke in Gallons, or Decimal Parts Thereof															
Area Square Inches	2	3	4	5	6	7	8	9	10	12	14	16	18	20	24	
1 1/4	2.405	.021	.031	.042	.052	.063	.073	.083	.094	.104	.125	.146	.166	.187	.219	
1 1/2	3.142	.027	.041	.054	.068	.082	.095	.109	.122	.136	.162	.186	.210	.234	.273	
2	3.976	.034	.052	.069	.086	.103	.121	.138	.155	.172	.206	.238	.270	.302	.354	
2 1/4	4.709	.041	.062	.081	.100	.119	.139	.158	.176	.195	.234	.268	.301	.334	.402	
2 1/2	5.010	.045	.067	.087	.108	.128	.149	.170	.191	.212	.255	.290	.324	.358	.438	
3	6.160	.061	.092	.122	.153	.184	.214	.245	.275	.306	.367	.428	.489	.550	.662	
3 1/4	6.596	.067	.108	.138	.169	.200	.231	.262	.293	.324	.400	.461	.522	.583	.718	
3 1/2	6.921	.073	.114	.144	.175	.205	.235	.265	.295	.325	.417	.479	.541	.603	.750	
4	8.045	.085	.133	.171	.209	.247	.285	.323	.361	.399	.494	.563	.632	.701	.883	
4 1/4	8.436	.092	.143	.181	.219	.257	.295	.333	.371	.409	.514	.583	.652	.721	.904	
4 1/2	8.751	.098	.150	.188	.226	.264	.302	.340	.378	.416	.521	.590	.659	.728	.912	
5	9.935	.110	.163	.201	.239	.277	.315	.353	.391	.429	.534	.603	.672	.741	.925	
5 1/4	10.326	.117	.170	.208	.246	.284	.322	.360	.398	.436	.541	.610	.679	.748	.932	
5 1/2	10.648	.123	.176	.214	.252	.290	.328	.366	.404	.442	.547	.616	.685	.754	.938	
6	12.068	.138	.191	.229	.267	.305	.343	.381	.419	.457	.562	.631	.700	.769	.953	
6 1/4	12.504	.145	.198	.236	.274	.312	.350	.388	.426	.464	.569	.638	.707	.776	.960	
6 1/2	12.826	.151	.204	.242	.280	.318	.356	.394	.432	.470	.575	.644	.713	.782	.966	
7	14.179	.166	.219	.257	.295	.333	.371	.409	.447	.485	.590	.659	.728	.797	.981	
7 1/4	14.615	.173	.226	.264	.302	.340	.378	.416	.454	.492	.597	.666	.735	.804	.988	
7 1/2	14.937	.179	.232	.270	.308	.346	.384	.422	.460	.498	.603	.672	.741	.810	.994	
8	16.357	.194	.247	.285	.323	.361	.399	.437	.475	.513	.618	.687	.756	.825	.1009	
8 1/4	16.793	.201	.254	.292	.330	.368	.406	.444	.482	.520	.625	.694	.763	.832	.1016	
8 1/2	17.115	.207	.260	.298	.336	.374	.412	.450	.488	.526	.631	.700	.769	.838	.1023	
9	18.535	.222	.275	.313	.351	.389	.427	.465	.503	.541	.646	.715	.784	.853	.1030	
9 1/4	18.971	.229	.282	.320	.358	.396	.434	.472	.510	.548	.653	.722	.791	.860	.1037	
9 1/2	19.293	.235	.288	.326	.364	.402	.440	.478	.516	.554	.659	.728	.797	.866	.1044	
10	20.713	.250	.303	.341	.379	.417	.455	.493	.531	.569	.674	.743	.812	.881	.1051	
10 1/4	21.149	.257	.310	.348	.386	.424	.462	.500	.538	.576	.681	.750	.819	.888	.1058	
10 1/2	21.471	.263	.316	.354	.392	.430	.468	.506	.544	.582	.687	.756	.825	.894	.1065	
11	22.891	.278	.331	.369	.407	.445	.483	.521	.559	.597	.702	.771	.840	.909	.1072	
11 1/4	23.327	.285	.338	.376	.414	.452	.490	.528	.566	.604	.709	.778	.847	.916	.1079	
11 1/2	23.649	.291	.344	.382	.420	.458	.496	.534	.572	.610	.715	.784	.853	.922	.1086	

The areas of circles are to each other as the squares of their respective diameters. In other words, doubling the diameter of a pipe or cylinder increases its capacity (area of circle) four times.

USEFUL INFORMATION

PER CENT OF SAVING OF FUEL BY HEATING FEED-WATER
STEAM AT 60 POUNDS

Final Temperature	Initial Temperature of Water											
	32°	40°	50°	60°	70°	80°	90°	100°	120°	140°	160°	180°
60°	2.39	1.71	0.86	.....	.....	.....	.....	.....	.....	.....	.....	.....
80	4.09	3.43	2.59	1.74	0.88	.....	.....	.....	.....	.....	.....	.....
100	5.79	5.14	4.32	3.49	2.64	1.77	0.90	.....	.....	.....	.....	.....
120	7.50	6.85	6.05	5.23	4.40	3.55	2.86	1.80	.....	.....	.....	.....
140	9.20	8.57	7.77	6.97	6.15	5.32	4.47	3.61	1.84	.....	.....	.....
160	10.90	10.28	9.50	8.72	7.91	7.09	6.26	5.42	3.67	1.87	.....	.....
180	12.60	12.00	11.23	10.46	9.68	8.87	8.06	7.23	5.52	3.75	1.91	.....
200	14.30	13.71	13.00	12.20	11.43	10.65	9.85	9.03	7.36	5.62	3.82	1.96
220	16.00	15.42	14.70	14.00	13.19	12.33	11.64	10.84	9.20	7.50	5.73	3.93
240	17.79	17.13	16.42	15.69	14.96	14.20	13.43	12.65	11.05	9.37	7.64	5.90
260	19.40	18.85	18.15	17.44	16.71	15.97	15.22	14.45	11.88	11.24	9.56	7.86

SUGGESTIONS REGARDING CORRESPONDENCE ABOUT PUMPS

In ordering or inquiring about pumps, purchasers should inform us upon the following questions:

For what purpose is the pump to be used?

What is the maximum quantity to be pumped per hour?

To what height is the water to be lifted by suction; the length of suction pipe, size and number of turns?

What is the pressure of steam to be used?

Is the water to be pumped hot or cold?

Inquiries about deep well pumps should inform us on the following questions:

Is your well already bored? If so, is it cased, and how? Or, if open well, so state.

What is its depth?

At what height does the water stand in the well, and what is the distance from water to ground level?

How much higher than the surface of the ground do you wish to raise the water?

What is the length of the horizontal pipe from well to tank or reservoir?

What is the greatest quantity, in gallons, of water required per day or hour?

Has your well been tested? If so, how, and what was the result?

ELECTRICAL UNITS

The electric units are as follows:

Volt—The unit of electrical motive force. Force required to send one ampere of current through one ohm of resistance.

Ohm—Unit of current. The current which one volt can send through a resistance of one ohm.

Coulomb—Unit of quantity. Quantity of current which, impelled by one volt, would pass through one ohm in one second.

Farad—Unit of capacity. A conductor or condenser which will hold one coulomb under the pressure of one volt.

Joule—Unit of work. The work done by one watt in one second.

Watt—The unit of electrical energy, and is the product of the ampere and volt. That is, one ampere of current flowing under a pressure of one volt gives one watt of energy.

One electrical horse-power is equal to 746 watts.

One kilowatt is equal to 1,000 watts.

To find the watts consumed in a given electrical circuit, such as a lamp, multiply the volts by the amperes.

To find the volts, divide the watts by the amperes.

To find the amperes, divide the watts by the volts.

To find the electrical horse-power required by a lamp, divide the watts of the lamp by 746.

To find the number of lamps that can be supplied by one electrical horse-power of energy, divide 746 by the watts of the lamp.

To find the electrical horse-power necessary, multiply the watts per lamp by the number of lamps and divide by 746.

To find the mechanical horse-power necessary to generate the required electrical horse-power, divide the latter by the efficiency of the generator.

To find the amperes of a given circuit, of which the volts and ohms resistance are known, divide the volts by the ohms.

To find the volts, when the amperes and watts are known, multiply the amperes by the ohms.

To find the resistance in ohms, when the volts and amperes are known, divide the volts by the amperes.

USEFUL INFORMATION

To find diameter of cylinder for a given power:

Multiply horse-power of engine by 33,000; divide product by the product of cylinder $\times$ steam pressure $\times$ piston speed in feet per minute.

Rule for finding contents in cubic feet of a cylinder of any given diameter.

Multiply the square of diameter in inches by .7854 and this product by length of stroke in inches. Divide last product by 1728, and the result is contents of cylinder in cubic feet.

The diameter of the valve rod should be 1-10 to 1-12 of the cylinder diameter; or from 1-350 to 1-300 of unbalanced area of slide valve. This last is considering the valve as a piston. Steel rods, of course, will bear being made smaller.

Don't depend too much upon the glass gauge but try the cocks often enough to keep your hand in in telling the height of water by them. If a gage cock has a tendency to leak, fix it thoroughly; if you do not you will neglect to use it for fear of the work which you may have to stop the leak after using.

Safety valves should be allowed to blow straight out into the room and not latched on to a leading pipe which may allow water to stand on the valve, increasing its weight, or to freeze up if the boiler is laid up. When the valve blows into the room it will be known, when steam is escaping, whether from leakage or over pressure.

The economy of an engine should always be rated by the amount of steam or water which it consumes per horse-power per hour. The amount of coal burned per horse-power per hour involves the economy of the whole plant, and is not a measure of the performance of the engine taken independently.

Horizontal engines, when practicable should be run over rather than under, as the thrust will then come downward upon the foundation rather than upon the caps of the boxes and the upper guides.

In calculating horse-powers of steam boilers, consider:

Tubular boilers, 15 square feet of heating surface, equivalent to 1 horse-power.

Portable boilers, 12 square feet of heating surface, equivalent to 1 horse-power.

Cylinder boilers, 10 square feet of heating surface, equivalent to 1 horse-power.

To find the area of safety-valve required:

Multiply the number of pounds of coal burned per hour by .045; or the number of pounds of water evaporated per hour by .006.

HOW TO CALCULATE SPEED

To find the speed of a countershaft, if the revolutions of the main shaft and size of pulleys are given: Multiply the revolutions of the main shaft by the diameter in inches of the pulley on the countershaft; the quotient will be the number of revolutions.

Example.—What will be the speed of a countershaft with a 12-inch pulley, driven by a 30-inch pulley 180 revolutions per minute? $180 \times 30 \div 12 = 450$.

To find the size of a pulley required, if the number of revolutions and size of pulley on the main shaft are given: Multiply the diameter in inches of driving pulley by the revolutions of the main shaft, and divide by the speed required; the quotient will be the diameter in inches of the pulley.

Example.—What will be the diameter of a pulley to make a countershaft turn 450 revolutions per minute, driven by a 30-inch pulley 180 revolutions per minute?

$180 \times 30 \div 450 = 12$ -inch pulley.

To find the size of a pulley for a main shaft, if the speed of shafts, and diameter of the pulley on the countershaft are given: Multiply the diameter in inches of pulley by speed of the countershaft, and divide by the revolutions of the main shaft. The quotient will be the diameter of the pulley.

Example.—What will be the diameter of a pulley on a main shaft making 180 revolutions per minute to drive a 12-inch pulley 450 revolutions per minute? $450 \times 12 \div 180 = 30$ -inch pulley.

A gallon of fresh water weighs 8½ pounds, and contains 231 cubic inches.

A cubic foot of water weighs 62½ pounds, and contains 1,728 cubic inches, or 7½ gallons.

The product is the area of a common valve required in square inches.

SAFETY VALVE RULES

To find the distance, ball should be placed on lever where the weight is known, or to find weight when distance is known:

Multiply pressure required by area of valve, then multiply this answer by the fulcrum, subtract the weight of the lever, valve and stem, and divide by the weight of the ball for distance, or divide by distance for weight of the ball with the same example.

To find the pressure when the area of the valve, the weight of the lever valve and stem, the fulcrum and the weight of the ball is known:

Divide fulcrum into length of lever, multiply the answer by weight of ball, add weight of lever, valve and stem, and divide by area of valve. The answer will be the steam pressure.

The mean effective weight of valve lever and stem is found by connecting a lever at fulcrum, tie the valve stem to lever, attach a spring scale to lever immediately over the valve, and raise until the valve is clear of its seat.

By the fulcrum is meant the distance the valve stem is from where the lever is connected.

FOR CALCULATING THE SPEED OF DRUMS AND PULLEYS

Problem No. 1.—The diameter of the driven being given, to find its number of revolutions.

Rule.—Multiply the diameter of the driver by number of its revolutions, and divide the product by the diameter of the driven; the quotient will be the number of revolutions of the driven.

Problem No. 2.—The diameter and revolutions of the driver being given, to find the diameter of the driven that shall make any given number of revolutions in the same time.

Rule.—Multiply the diameter of the driver by its number of revolutions and divide the product by the number of revolutions of the driven; the quotient will be its diameter.

Problem No. 3.—To ascertain the size of the driver.

Rule.—Multiply the diameter of the driver by the number of revolutions you wish it to make, and divide the product by the revolutions of the driver; the quotient will be the diameter of the driver.

N. B.—In ordering pulleys, be careful to give the exact size of the shaft on which they are to go; also state how you wish them finished on the face—flat face for shifting belt, or rounding for non-shifting.

USEFUL INFORMATION

MEASUREMENT OF WATER IN PIPES

Square the diameter of the pipe in inches, and the product is the number of pounds weight of water in one yard of the pipe.

As a gallon of water weighs about ten pounds, divide the number of pounds by 10, and the result is the number of gallons of water in one yard of the pipe.

FRICTION OF WATER IN PIPES

Friction loss in pounds pressure per square inch for each 100 feet of length in different size clean iron pipe, discharging given quantities of water per minute.

Gallons Per Minute	Size of Pipe—Inside Diameter											
	¾ In.	1 In.	1¼ In.	1½ In.	2 In.	2½ In.	3 In.	4 In.	6 In.	8 In.	10 In.	12 In.
5	3.3	0.84	0.31	0.12	.....	.....	.....	.....	.....	.....	.....	.....
10	13.0	3.16	1.05	0.47	0.12	.....	.....	.....	.....	.....	.....	.....
15	28.7	6.98	2.38	0.97	.....	.....	.....	.....	.....	.....	.....	.....
20	50.4	12.3	4.07	1.66	0.42	.....	.....	.....	.....	.....	.....	.....
25	78.0	19.0	6.40	2.62	.....	0.21	0.10	.....	.....	.....	.....	.....
30	.....	27.5	9.15	3.79	0.91	.....	.....	.....	.....	.....	.....	.....
35	.....	37.0	12.4	5.05	.....	.....	.....	.....	.....	.....	.....	.....
40	.....	48.0	16.1	6.52	1.69	.....	.....	.....	.....	.....	.....	.....
45	.....	.....	20.2	8.15	.....	.....	.....	.....	.....	.....	.....	.....
50	.....	.....	24.9	10.0	2.44	0.81	0.35	0.09	.....	.....	.....	.....
75	.....	.....	36.1	22.4	5.32	1.80	0.74	.....	.....	.....	.....	.....
100	.....	.....	.....	39.0	9.46	3.20	1.31	0.33	0.05	.....	.....	.....
125	.....	.....	.....	.....	14.9	4.89	1.99	.....	.....	.....	.....	.....
150	.....	.....	.....	.....	21.2	7.0	2.85	0.69	0.10	.....	.....	.....
175	.....	.....	.....	.....	28.1	9.46	3.85	.....	.....	.....	.....	.....
200	.....	.....	.....	.....	37.5	12.47	5.02	1.22	0.17	.....	.....	.....
250	.....	.....	.....	.....	.....	19.65	7.76	1.89	0.25	0.07	0.03	0.01
300	.....	.....	.....	.....	.....	28.06	11.2	2.66	0.37	0.09	0.04	.....
350	.....	.....	.....	.....	.....	.....	15.2	3.85	0.50	0.12	0.05	0.02
400	.....	.....	.....	.....	.....	.....	19.5	4.73	0.65	0.16	0.06	.....
500	.....	.....	.....	.....	.....	.....	30.8	7.43	0.96	0.25	0.09	0.04
750	.....	.....	.....	.....	.....	.....	.....	.....	2.21	0.53	0.18	0.08
1000	.....	.....	.....	.....	.....	.....	.....	.....	3.88	0.94	0.32	0.13

Doubling the diameter of a pipe increases its capacity four times. Friction of liquids in pipes increases as the square of the velocity.

The mean pressure of the atmosphere is usually estimated at 14.7 pounds per square inch, so that with a perfect vacuum it will sustain a column of mercury 29.9 inches, or a column of water 33.9 feet high.

To find the pressure in pounds per square inch of a column of water: Multiply the height of the column in feet by .434. Approximately, we say, that every foot elevation is equal to ½ pound pressure per square inch; this allows for ordinary friction. To find the height of a column of water, multiply the pressure by 2.31.

To find the diameter of a pump cylinder to move a given quantity of water per minute (100 feet of piston being the standard of speed): Divide the number of gallons by 4, then extract the square root, and the product will be the diameter in inches of the pump cylinder.

To find quantity of water elevated in one minute running at 100 feet of piston speed per minute: Square the diameter of the water cylinder in inches and multiply by 4. Example: Capacity of a 5-inch cylinder is desired. The square of the diameter (5 inches) is 25, which multiplied by 4 gives 100, the number of gallons per minute (approximately).

To find the capacity of a cylinder in gallons: Multiply the area in inches by the length of stroke in inches will give the total number of cubic inches; divide this amount by 231 (which is the cubic contents of a U. S. gallon in inches) and product is the capacity in gallons.

The capacity per minute will be determined by multiplying this product by number of strokes cylinder is working per minute.

To find the horse-power necessary to elevate water to a given height: Multiply the number of gallons per minute by 8.35 (weight of one gallon), and this result by total number of feet water is raised (that is, from surface of the water to the highest point to which the water is raised), and you have the power in foot-pounds. Divide by 33,000, and you have the horse-power. One horse-power is equal to about five men. To the theoretical power a liberal allowance for friction, etc., always wants to be added.

It is estimated that it requires, approximately, one horse-power, including friction, to raise sixty gallons of water per minute thirty-three feet high. It is immaterial whether it is raised with a large or small pump, as the theory is, it requires a given quantity of power to raise a given quantity of water a given height in a given length of time. Of course, if the pump is large it must be worked slowly; and if small, it can be worked faster; the power required to work a small pump fast is the same as to work a large pump slow for the same given height and quantity.

To find the area of a required pipe, the volume and velocity of water being given: Multiply the number of cubic feet of water by 144, and divide the product by the velocity in feet per minute. The area being found, it is easy to get the diameter of pipe necessary.

To find the velocity in feet per minute necessary to discharge a given volume of water in a given time. Multiply the number of cubic feet of water by 144, and divide the product by the area of the pipe in inches.

USEFUL INFORMATION—CONTINUED

NOTES ON BELTING

When it is not convenient to measure with the tape line the length required, the following rule will be found of service:

Add the diameter of two pulleys together, divide the result by 2 and multiply the quotient by $3\frac{1}{4}$; then add this product to twice the distance between the centers of the shafts and you have length required.

2d. Don't overtax belts by overloading them or running them tighter than necessary.

3rd. Never condemn a belt until cause of failure has been well ascertained. Belting needs care to secure best results. A belt should not be blamed for running badly, if the shafting and pulleys are out of line. It does not follow because the shafting is put up right that it will remain so. The wooden supports will shrink, and the hangers become loose, thereby causing belts to run off pulleys.

4th. Do not grudge an extra inch of belt where there is pulley width.

5th. A good machine is most valuable when driven by a proper belt.

6th. An overworked belt gives much vexing trouble and wastes more money than can readily be counted. An underworked belt never ruddles the temper of its owner. The volume of its work is constant and steady.

7th. Good belting keeps the machines fully employed. Many good and perfect belts are broken and destroyed by fixing them over the edge of a running pulley. The fault lies in the belt being some inches too short. Workmen look for stretch, but get instead torn belts or broken pieces of machinery.

8th. Thin belts, as wide as possible, give by far the best results, working vertically. A thick vertical belt will not hug the pulleys.

9th. Keep your belt soft and pliable by using a good belt dressing. It increases the capacity of transmitting power, and at the same time prolongs the life of the belt.

10th. By working independent belts, one on top of the other, on one pair of pullers, or a number of belts working tandem one over the other from one main driving pulley, the result is much the same as the gain secured by using the same steam in the high and low pressure cylinders of an engine. In many applications of this theory the result has been most satisfactory. By compounding two single or double belts the gain in horse power is over 80 per cent.

11th. The larger the diameter of pulleys, the smaller the belting account.

12th. The best belting is the most economical in the long run.

WEIGHTS AND MEASURES RECOGNIZED BY THE LAWS
OF THE UNITED STATES

Article	Weight, Per Bushel, Lbs.	Article	Weight, Per Bushel, Lbs.	Article	Weight, Per Bushel, Lbs.	Article	Weight, Per Bushel, Lbs.
Wheat	60	White beans	60	Dried peaches ..	53	Turnips	55
Shelled corn.....	56	Castor beans	46	Dried apples	26	Unslacked lime..	29
Corn in ear.....	70	Clover seed	60	Onions	57	Corn meal	48
Rye	56	Timothy seed	45	Salt	65	Fine salt	55
Oats	32	Flax seed	56	Stone coal	80	Hungarian grass	
Barley	48	Hemp seed	44	Malt	28	seed	50
Irish potatoes....	60	Peas	60	Bran	20	Blue grass seed..	44
Sweet potatoes....	55	Buckwheat	58	Plastering hair..	8		

CORRECT SPEED ELEVATOR BELTS SHOULD RUN OVER A GIVEN SIZE
PULLEY IN ORDER TO GET A FREE AND PERFECT DISCHARGE

Diameter of Pulley.....inches	12	14	16	18	20	24	36	48	60
Feet per minute belts should run..	160	170	180	190	200	200	300	400	500
	to	to	to	to	to	to	to	to	to
	180	190	200	210	220	250	350	450	550

USEFUL INFORMATION

TABLE OF AREAS OF CIRCLES

Diameter, Inches	Area, Sq. Inches	Diameter, Inches	Area, Sq. Inches	Diameter, Inches	Area, Sq. Inches	Diameter, Inches	Area, Sq. Inches
3/8	.602	7 1/4	47.17	18 1/2	268.80	37 1/2	1104.5
1/2	.649	8	50.26	19	283.52	38	1134.1
5/8	.696	8 1/4	53.45	19 1/2	298.54	38 1/2	1164.2
3/4	.743	8 1/2	56.74	20	314.16	39	1194.6
7/8	.790	8 3/4	60.13	20 1/2	329.06	39 1/2	1225.4
1	.837	9	63.61	21	344.36	40	1256.6
1 1/8	.884	9 1/4	67.20	21 1/2	359.06	40 1/2	1288.3
1 1/4	.931	9 1/2	70.88	22	380.13	41	1320.3
1 1/2	.978	9 3/4	74.66	22 1/2	397.00	41 1/2	1352.7
1 3/4	1.025	10	78.54	23	415.47	42	1385.4
1 7/8	1.072	10 1/4	82.51	23 1/2	433.73	42 1/2	1418.6
2	1.119	10 1/2	86.59	24	452.39	43	1452.2
2 1/8	1.166	10 3/4	90.76	24 1/2	471.43	43 1/2	1486.2
2 1/4	1.213	11	95.03	25	490.87	44	1520.6
2 1/2	1.260	11 1/4	99.40	25 1/2	510.70	44 1/2	1555.3
2 3/4	1.307	11 1/2	103.86	26	530.93	45	1590.4
2 7/8	1.354	11 3/4	108.43	26 1/2	551.54	45 1/2	1626.0
3	1.401	12	113.09	27	572.55	46	1661.9
3 1/8	1.448	12 1/4	117.85	27 1/2	593.96	46 1/2	1698.2
3 1/4	1.495	12 1/2	122.71	28	615.75	47	1734.9
3 1/2	1.542	12 3/4	127.67	28 1/2	637.94	47 1/2	1772.1
3 3/4	1.589	13	132.73	29	660.52	48	1809.6
3 7/8	1.636	13 1/4	137.88	29 1/2	683.49	48 1/2	1847.5
4	1.683	13 1/2	143.13	30	706.86	49	1885.7
4 1/8	1.730	13 3/4	148.48	30 1/2	730.61	49 1/2	1924.4
4 1/4	1.777	14	153.93	31	754.76	50	1963.5
4 1/2	1.824	14 1/4	159.48	31 1/2	779.31	50 1/2	2003.0
4 3/4	1.871	14 1/2	165.13	32	804.25	51	2042.8
4 7/8	1.918	14 3/4	170.87	32 1/2	829.57	51 1/2	2083.1
5	1.965	15	176.71	33	855.29	52	2123.7
5 1/8	2.012	15 1/4	182.65	33 1/2	881.41	52 1/2	2164.8
5 1/4	2.059	15 1/2	188.69	34	907.92	53	2206.2
5 1/2	2.106	15 3/4	194.83	34 1/2	934.82	53 1/2	2248.0
5 3/4	2.153	16	201.06	35	962.11	54	2290.2
5 7/8	2.200	16 1/4	207.38	35 1/2	989.80	54 1/2	2332.8
6	2.247	16 1/2	213.80	36	1017.88	55	2375.8
6 1/8	2.294	17	220.35	36 1/2	1046.4	55 1/2	2419.2
6 1/4	2.341	17 1/2	227.02	37	1075.2	56	2463.0
6 1/2	2.388	18	233.86				

HORSE POWER OF SHAFTS

We publish herewith a table used in general practice for the transmission of power where shafts are properly supported.

When shafts are used for conveying power from one point to another without any of the bending strains of pulleys, gears, etc., the next smaller size may be used.

This table must not be confounded with tables of actual strength of shafts published by other authorities.

HORSE POWER OF SHAFTS FOR GIVEN DIAMETER AND SPEED

Diameter of Shaft, Inches	Revolutions per Minute								
	100	125	150	175	200	225	250	300	400
1 1/8	2.4	3	3.6	4.2	4.8	5.4	6	7.2	9.6
1 1/4	4.3	5.4	6.5	7.6	8.6	9.8	10.8	13	17.2
1 1/2	6.5	8	9.7	11.2	13	14.6	16	19.4	26
1 3/4	10	12.5	15	17.5	20	22.5	25	30	40
2	14	17.8	21	24.5	28	31.5	35.6	42	56
2 1/8	20	25	30	35	40	45	50	60	80
2 1/4	26.5	32.5	39	44.6	53	59	65	80	106
2 1/2	34	42.5	51	59.5	68	76.5	85	102	136
2 3/4	54	67.5	81	94.5	108	122	135	162	216
3	80	100	120	140	160	180	200	240	320
3 1/8	114	142.5	171	199.5	228	256.5	285	342	456
3 1/4	156	195	234	273	312	351	390	468	624
3 1/2	208	260	312	364	416	468	520	624	832
3 3/4	270	337.5	405	472.5	540	607.5	675	810	1080
4	340	425	510	595	680	765	850	1020	1360
4 1/8	420	525	630	735	840	945	1050	1260	1680
4 1/4	500	625	750	875	1000	1125	1250	1500	2000

It is well to say in this connection that no matter what general rules are adopted, there are frequently special cases in which the engineer or designer must depart from his rules, and use his judgment in determining both the size of the shaft and the number and location of bearings.

USEFUL INFORMATION

RULE FOR CALCULATING QUANTITIES OF EARTH WORK

Rule 1. End Areas—Take the two side cuttings, as marked on slope stakes; add them together, divide by 2, and multiply by one-half the road-bed. This gives first product. Take the two distances out from the center line to the two slope stakes, add them together, divide by two, and multiply by the center cutting as marked on the center stake. This gives second product.

Add first and second products together and you get the end area in square feet.

Rule 2. To get the quantity in cubic yards between two adjacent end areas.

Add the two end areas, as computed by the above rule, divide this product by 2, and you get average area in square feet.

Multiply average area by the distance (in feet) between the two end areas and divide product by 27, and the final result thus obtained is the required volume in cubic yards. This rule applies to fills as well as cuts, and to any roadway or slope. Take all measurements in feet and tenths of feet (not inches).

Example—Road bed = 18 feet; side slopes, 1 to 1; center cutting, 6.2 feet; left cutting, 7.0 feet; right cutting, 10.0 feet.

Then to get the distance that the left slope stake is from the center line, we have one-half the road-bed plus the projection of the slope, in the present case 9 feet (one-half of the road-bed), + 7 feet (projection of slope) = 16 feet out from center line. For the distance out of right slope stake from center line we have 9 + 10 = 19 feet out from center line. In general practice these distances out are marked on the slope stakes, or they can be measured in the field.

EARTHWORK-ANGLES OF SLOPES

Slopes $\frac{1}{2}$ to 1 = 63° 29'	Slopes $\frac{1}{4}$ to 1 = 29° 44'
Slopes $\frac{3}{4}$ to 1 = 53° 00'	Slopes 2 to 1 = 26° 35'
Slopes 1 to 1 = 45° 00'	Slopes 3 to 1 = 18° 25'
Slopes $\frac{1}{2}$ to 1 = 38° 40'	Slopes 4 to 1 = 14° 12'
Slopes $\frac{1}{3}$ to 1 = 33° 42'	

NATURAL SLOPES OF EARTH WITH HORIZONTAL LINE

Gravel	Average 40°
Dry sand	Average 38°
Sand	Average 35°
Vegetable earth	Average 28°
Compact earth	Average 59°
Shingle	Average 39°
Rubble	Average 45°
Clay, well drained	Average 45°
Clay, wet	Average 16°

Earth and clay increase in bulk $\frac{1}{4}$ when dug, but subside 1-5 in height and decrease 1-6 in bulk when formed into embankments.

Sand and gravel increase in bulk 1-12 when dug; sand subsides in embankment $\frac{1}{4}$ in height; gravel from 1-10 to 1-12, according to coarseness.

COST OF LABOR ON EMBANKMENTS

Single Horse and Cart—Loaded cart in excavation and embankment can go 100 lineal feet and return in 1 minute, while moving. Time lost in loading, waiting, etc. = 4 minutes per load.

A medium laborer will load in a cart, in 10 hours, cubic yards of earth measured in the bank as follows: Gravelly earth, 10; loam, 13; sandy earth, 14.

Carts are loaded from banks: Descending hauling, $\frac{1}{4}$ of a cubic yard in bank; level hauling, 2-7 of a cubic yard in bank; ascending hauling, $\frac{1}{4}$ of a cubic yard in bank.

Loosening—In **Loam**—A three-horse plow will loosen 250 to 300 cubic yards in 10 hours; cost of do., from 1 to 8 cents per cubic yard, when wages = 105 cents per day.

Trimming and Bossing—2 cents per cubic yard.

Scooping—A scoop load = 1-10 of a cubic yard in bank. The time lost in loading, unloading, and turning, per load, = $\frac{1}{2}$ minutes. Time lost for every 70 feet of distance from excavation to bank and returning = 1 minute.

Hauling Stone—A cart, with horses, over an ordinary road, will travel 1.1 miles per hour. A four-horse team will haul 25 to 35 cubic feet of limestone per load.

Time of unloading, loading, etc., averages 35 minutes per trip; cost of do., with horse crane at quarry and unloading by hand, when labor = \$1.25 per day and horse = .75, is 25 cents per perch 24.75 cubic feet.

The work done by an animal is greatest when the velocity with which he moves is $\frac{1}{4}$ of the greatest velocity he can move when unloaded, and the force then exerted is equal to .45 of the force the animal can exert at a dead pull.

QUANTITIES OF EARTHS EQUAL TO A TON

Sand, river, as filled into carts.....	21 cu. ft.
Sand, pit, as filled into carts.....	22 cu. ft.
Gravel, coarse, as filled into carts.....	23 cu. ft.
Marl, as filled into carts.....	28 cu. ft.
Clay, stiff, as filled into carts.....	28 cu. ft.
Chalk, lump, as filled into carts.....	29 cu. ft.
Earth, mould, as filled into carts.....	33 cu. ft.

WEIGHT OF EARTHS, ROCKS, ETC.

Weight of cubic yard of sand.....	about 20 cwt.
Weight of cubic yard of gravel.....	about 20 cwt.
Weight of cubic yard of mud.....	about 25 cwt.
Weight of cubic yard of marl.....	about 26 cwt.
Weight of cubic yard of clay.....	about 31 cwt.
Weight of cubic yard of chalk.....	about 36 cwt.
Weight of cu. yard of sandstone.....	about 39 cwt.
Weight of cubic yard of shale.....	about 40 cwt.
Weight of cubic yard of quartz.....	about 41 cwt.
Weight of cubic yard of granite.....	about 42 cwt.
Weight of cubic yard of trap.....	about 42 cwt.
Weight of cubic yard of slate.....	about 43 cwt.

Rock increases $\frac{1}{2}$ of its original bulk when excavated.

CEMENTS

Cement to Resist Fire and Water and Harden Quickly—Two parts finely sifted unoxidized iron filings; one part perfectly dry, finely powdered loam. Knead the mixture with strong vinegar, into a homogeneous plastic mass, to be used as soon as made.

For Turned and Bored Joints—One part white lead, one part red lead. Mix with boiled linseed oil to the proper consistency.

For Stopping Joints, etc.—White lead in oil, mixed with enough white sand to make a stiff paste. This grows hard by exposure, and resists heat, cold, and water.

Glycerine Cement—A valuable cement for general use, stopping leaks in tanks, jointing chemical apparatus, such as glass and brass; in fact, closing cracks and stopping leaks in almost everything, may be made by mixing commercial glycerine and litharge to the consistency of dough. It may be somewhat improved by using Portland cement and litharge, equal parts, when the joints or cracks are large.

USEFUL INFORMATION

BRICKWORK, ETC.

(Kiddier.)

In engineering works of magnitude, brickwork is measured by the cubic yard, solid measurement. There are different methods of computing measurement of bricks in a given wall. One is to find the number of bricks in a cubic foot of finished work, and multiply this by the number of cubic feet in the given work; this is a very good method, but the more common method among masons is to compute the superficial area of wall, and multiply by the number of bricks in a square foot for walls of given thickness.

Brick work is generally measured by 1,000 bricks laid in the wall. In consequence of variations in size of bricks, no rule for volume of laid brick can be exact. The following scale is, however, a fair average:

7 bricks to a super. foot, 4 in. wall = 40 lbs.
14 bricks to a super. foot, 9 in. wall = 94 lbs.
21 bricks to a super. foot, 13 in. wall = 121 lbs.
28 bricks to a super. foot, 18 in. wall = 168 lbs.
35 bricks to a super. foot, 22 in. wall = 210 lbs.

Corners are not measured twice as in stone work. Openings over 3 feet square are deducted. Arches are counted from the spring. Fancy work counted $1\frac{1}{2}$ bricks for 1. Pillars are measured on their face only.

A cubic yard of mortar requires 1 cubic yard of sand and 9 bushels of lime, and will fill 30 beds.

The following table gives the usual dimensions of the bricks in the various parts of the country:

Description	Inches
Baltimore Front	$8\frac{1}{4} \times 4\frac{1}{4} \times 2\frac{3}{4}$
Philadelphia Front	
Wilmington Front	
Trenton Front	
Croton	$8\frac{1}{2} \times 4 \times 2\frac{1}{4}$
Colabaugh	$8\frac{1}{4} \times 3\frac{3}{4} \times 2\frac{3}{4}$
Maline	$7\frac{1}{4} \times 3\frac{3}{4} \times 2\frac{3}{4}$
Milwaukee	$8\frac{1}{4} \times 4\frac{1}{4} \times 2\frac{3}{4}$
North River	$8 \times 3\frac{3}{4} \times 2\frac{1}{4}$
Trenton	$8 \times 4 \times 2\frac{1}{4}$
Ordinary	$7\frac{3}{4} \times 3\frac{3}{4} \times 2\frac{1}{4}$ $8 \times 4 \times 2\frac{3}{4}$

The weight of the small-sized bricks is about 4 pounds on the average, and of the larger, about 6 pounds.

Dry bricks will absorb about one-fifteenth of their weight in water.

All bricks should be wet before laying, especially in dry weather, as otherwise they take water from the mortar, and thus reduce its strength. Do not have bricks "dripping wet," but allow them to take all the water they will. This is especially necessary where cement mortar is used.

WEIGHTS

Description	Average Weight in lbs. per Cu. F.
Brick, best pressed	159
Brick, common hard	125
Brick, soft	100
Brick, fire	137
Brickwork, common	112
Brickwork, pressed	140
Mortar, hardened	100

One thousand bricks, closely stacked, occupy about 56 cubic feet.

One thousand old bricks, cleaned and loosely stacked, occupy about 72 cubic feet.

One superficial foot of gauged arches requires 10 bricks.

Stock bricks commonly measure $8\frac{1}{4}$ inches by $4\frac{1}{4}$ inches by $2\frac{3}{4}$ inches, and weigh from 5 to 6 pounds each.

Paving-bricks should measure 9 inches by $4\frac{1}{2}$ inches by $1\frac{1}{2}$ inches, and weigh about $4\frac{1}{2}$ pounds each.

Eight bricks in a course make a flue 8×16 in.

Nine bricks in a course make a flue 8×20 in.

Sixteen bricks in a course make a flue 16×10 inches.

One yard of paving requires 36 stock bricks, of above dimensions, laid flat, or 52 on edge; and 35 paving bricks laid flat, or 52 on edge. A bricklayer's hod, measuring 1 foot 4 inches by 9 inches by 9 inches, equals 1.296 cubic inches in capacity, and contains twenty bricks.

A single load of sand and other material equals one cubic yard, or 27 cubic feet; and a double load equals twice that quantity. Quantity in a load should be specified when buying.

A measure of lime is one cubic yard.

Laying Per Day.—Trautwine gives one bricklayer and one helper will lay, in common house walls, on an average about 1,500 bricks per day of ten working hours. In neater face work, of back buildings, from 1,000 to 1,200; in good ordinary street fronts, 900 to 1,000; finest lower story faces, 150 to 300. In plain, massive engineering work, he should average about 2,000 per day, or 4 cubic yards, and in large arches, about 1,500, or 3 cubic yards.

STONE WORK

Stone walls are measured by the perch ($24\frac{1}{2}$ cubic feet). Openings less than 3 feet wide are counted solid; over 3 feet deducted, but 18 inches are added to the running measure for each jamb built. Arches are counted solid from their spring. Corners of buildings are measured twice. Pillars less than 3 feet are counted on three sides as lineal, multiplied by fourth side and depth.

It is customary to measure all foundation and dimension stone by the cubic feet. Water tables and base courses by lineal feet. All sills and lintels or ashlar, by superficial feet, and no wall less than 18 inches thick.

The greatest safe load per super. foot on—

Granite piers	= 40 tons.
Limestone piers	= 25 tons.
Sandstone piers	= 15 tons.
Brickwork in cement	= 3 tons.
Rubble masonry	= 2 tons.
Lime concrete foundations	= $2\frac{1}{2}$ tons.

The height of brick of stone piers should not exceed 12 times their least thickness at base.

USEFUL INFORMATION

CEMENT SIDEWALKS AND FLOORS

For the concrete use, by volume: One part Portland cement, two parts sand, five parts broken stone; as little water as possible. Mix the sand and cement dry, then add at once all the water to be used, and mix. To the mortar thus made add and mix in the broken stone after wetting it.

For the finishing coat use mortar (without the broken stone) made as above, but with water enough to work easily under the trowel.

For 100 square feet of walk or floor, four inches thick, are required two barrels of cement, $1\frac{1}{2}$ cubic yards of sand and gravel, or sand and broken stone.

To Keep Machinery from Rusting.—Take an ounce of camphor, dissolve it in one pound of melted lard; take off the scum and mix with as much fine black lead as will give it an iron color. Clean the machinery and smear it with this mixture; after 24 hours rub clean with a soft linen cloth.

CONCRETE WALLS

Concrete walls for houses are built of 1 of cement to 6 or 7 of broken stone, shingle, gravel, or slag. The substance mixed with the cement must be free from loam, fine sand, clay, or dirt of any kind.

To prevent the cement from adhering to the plank of the mould, apply freely to them with a brush soap boiled to the consistency of paint.

PLASTERING

Estimate of material for 100 square yards.

Materials	2 Coats Slipped Coat Finish	3 Coats with Hard Finish	Materials	2 Coats Slipped Coat Finish	3 Coats with Hard Finish
Quicklime	3 $\frac{1}{4}$ casks	4 casks	Common sand.	6 loads	7 loads
Quicklime for fine stuff.			White sand.		2 $\frac{1}{2}$ bushels
Plaster of Paris		$\frac{3}{4}$ casks	Nails	13 pounds	13 pounds
Laths	2000	$\frac{1}{2}$ casks	Mason's labor.	3 $\frac{1}{2}$ days	4 days
Hair	3 bushels	4 bushels	Laborer	2 days	3 days

Plastering laths are usually of white or yellow pine, $1\frac{1}{2}$ inches wide, $\frac{1}{4}$ inch thick, and 3 or 4 feet long. They are nailed up horizontally, about $\frac{1}{2}$ inch apart. The upright stud of partitions are spaced at such distances apart (usually about 15 inches, center to center), that the ends of the laths may be nailed to them. Laths are sold in bundles of 1,000 each. A square foot of surface requires $1\frac{1}{2}$ four-foot laths, or 1,000 such laths will cover 660 square feet. A carpenter can nail up the laths for from 40 to 60 square yards of plastering in a day of 10 hours, depending on the number of angles in the room, etc.

Plastering is always measured by the square yard for plain work, by the superficial foot for cornice of plain members, and by lineal foot for enriched or carved mouldings in cornices.

PAINTING

One pound of ready-mixed paint, when thinned, will cover about two square yards of first coat, three yards of second, and four yards of each subsequent coat; or $1\frac{1}{2}$ pounds to the square yard will be required for four coats, and $1\frac{1}{4}$ pounds for five coats.

Glazier's Putty.—Whiting, 70 pounds; boiled oil, 20 pounds; water, 2 gallons; mix. If too thin, add more whiting; if too thick, add more oil.

To Soften Putty.—To remove old putty from broken windows, dip a small brush in nitro-muriatic acid, or caustic soda (concentrated lye), and with it anoint or paint over the dry putty that adheres to the broken glass and frames of your windows; after an hour's interval the putty will have become so soft as to be easily removable.

Mason Work.—(Brick.) One and one-eighth barrels lime and $\frac{1}{2}$ yard sand will lay 1,000 bricks. One man will lay 150 feet of stone per day with one tender.

Cement.—One and one-quarter barrels cement and $\frac{3}{4}$ yard sand will lay 100 feet rubble stone.

Mortar.—One part lime, three parts river sand.

Coarse Mortar.—One part lime, four parts coarse sand.

Concrete.—One part lime, four parts gravel, two parts sand.

AMOUNT OF BARBED WIRE REQUIRED FOR FENCES

Estimated number of pounds of barbed wire required to fence space or distances mentioned, with one, two, or three lines of wire, based upon each pound of wire measuring one rod, (16 $\frac{1}{2}$ feet.)

	1 Line	2 Line	3 Lines
1 Square Acre	50 $\frac{1}{2}$ pounds.	101 $\frac{1}{2}$ pounds.	152 pounds.
1 Side of Square Acre.	12 $\frac{1}{2}$ pounds.	25 $\frac{1}{2}$ pounds.	38 pounds.
1 Square Half-acre	36 pounds.	72 pounds.	108 pounds.
1 Square Mile	1,280 pounds.	2,560 pounds.	3,840 pounds.
1 Side of a Square Mile.	320 pounds.	640 pounds.	960 pounds.
1 Rod in Length	1 pound.	2 pounds.	3 pounds.
100 Rods in Length.	100 pounds.	200 pounds.	300 pounds.
100 Feet in Length.	6 $\frac{1}{2}$ pounds.	12 $\frac{1}{2}$ pounds.	18 $\frac{1}{2}$ pounds.

TABLE OF EFFECTIVE FIRE STREAMS

Using 100 feet of 2½-inch ordinary best quality rubber-lined hose between nozzle and hydrant or pump.

Smooth nozzle, size.....	¾-inch					¾-inch					1-inch				
Pressure at hydrant.....lbs.	32	43	54	65	75	86	97	108	119	130	141	152	163	174	185
Pressure at nozzle.....lbs.	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170
Press. lost in 100 ft. 2½" hose.....lbs.	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Vertical height.....ft.	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216
Horizontal distance.....ft.	37	44	50	56	62	68	74	80	86	92	98	104	110	116	122
Gallons discharged per minute..	90	104	116	127	137	147	157	167	177	187	197	207	217	227	237

Smooth nozzle, size.....	1¼-inch					1¼-inch					1½-inch				
Pressure at hydrant.....lbs.	42	56	70	84	98	112	126	140	154	168	182	196	210	224	238
Pressure at nozzle.....lbs.	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170
Press. lost in 100 ft. 2½" hose.....lbs.	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68
Vertical height.....ft.	52	65	78	91	104	117	130	143	156	169	182	195	208	221	234
Horizontal distance.....ft.	50	59	66	72	77	81	84	87	90	93	96	99	102	105	108
Gallons discharged per minute..	206	238	266	291	314	336	356	376	393	409	429	446	461	476	491

CONTENTS OF ROUND TANKS IN U. S. GALLONS FOR EACH FOOT IN DEPTH

Inside Diameter Ft. In.	Gallons 1 foot in depth	Inside Diameter Ft. In.	Gallons 1 foot in depth	Inside Diameter Ft. In.	Gallons 1 foot in depth	Inside Diameter Ft. In.	Gallons 1 foot in depth
1 0	5.87	5 9	194.19	10 6	653.69	15 3	1265.96
1 3	9.17	6 0	211.44	10 9	678.88	15 6	1407.51
1 6	13.21	6 3	229.43	11 0	719.09	15 9	1487.00
1 9	17.98	6 6	248.15	11 3	743.36	16 0	1603.82
2 0	22.49	6 9	267.61	11 6	776.77	16 3	1659.97
2 3	29.73	7 0	287.80	11 9	810.91	16 6	1699.66
2 6	36.70	7 3	308.72	12 0	848.18	16 9	1747.89
2 9	44.41	7 6	330.28	12 3	881.29	17 0	1697.45
3 0	52.86	7 9	352.76	12 6	917.73	17 3	1747.74
3 3	62.03	8 0	375.90	12 9	954.81	17 6	1798.76
3 6	73.15	8 3	399.76	13 0	992.62	17 9	1850.53
3 9	82.59	8 6	424.26	13 3	1031.17	18 0	1903.02
4 0	93.97	8 9	449.21	13 6	1070.45	18 3	1956.25
4 3	103.03	9 0	475.80	13 9	1108.06	18 6	2010.21
4 6	118.93	9 3	502.65	14 0	1151.21	18 9	2064.91
4 9	132.52	9 6	529.18	14 3	1192.69	19 0	2121.58
5 0	146.82	9 9	558.45	14 6	1234.91	19 3	2178.68
5 3	161.88	10 0	587.47	14 9	1277.86	19 6	2235.62
5 6	177.67	10 3	617.17	15 0	1321.54	20 0	2349.46

WEIGHTS AND MEASURES

METRIC SYSTEM

- LENGTH**
 1 millimeter = .0394 inches.
 1 centimeter = .3937 inches.
 1 meter = 39.3708 inches.
 1 kilometer = .6214 miles.

- SQUARE**
 1 square centimeter = .1549 square inches.
 1 square meter = 10.7631 square feet.
 1 are = 119.5994 square yards.
 1 hectare = 2.4711 acres.

- CUBIC**
 1 cubic meter = 35.3166 cubic feet.

- WEIGHT**
 1 gram = 15.4323 grains.
 1 kilogram = 2.2046 lbs.
 1 tonneau = 2204.55 lbs.

- DRY MEASURE**
 1 centiliter = .0081 pints.
 1 liter = .908 quarts.
 1 hectoliter = 2.837 bushels.

- LIQUID MEASURE**
 1 centiliter = .0211 pints.
 1 liter = 1.0567 quarts.
 1 hectoliter = 26.4176 gallons.

U. S. STANDARD

- LENGTH**
 1 inch = 2.5399 centimeters.
 1 foot = 30.4794 centimeters.
 1 yard = .9143 meters.
 1 mile = 1.6093 kilometers.

- SQUARE**
 1 square inch = 6.4513 square centimeters.
 1 square foot = .0929 square meters.
 1 square yard = .8361 square meters.
 1 acre = .4047 hectares.

- CUBIC**
 1 cubic foot = .02831 cubic meters.

- WEIGHT**
 1 lb. = .4536 kilos.
 1 cwt. = 50.8024 kilos.
 1 ton = 1016.0483 kilos.

- DRY MEASURE**
 1 pint = 55.061 centiliters.
 1 quart = 1.1013 liters.
 1 bushel = 35.236 liters.

- LIQUID MEASURE**
 1 pint = 47.317 centiliters.
 1 quart = .9553 liters.
 1 gallon = 3.7854 liters.

1 U. S. ton of shipping = 40 cubic feet = 32.143 U. S. bushels = 1.1325 cubic meters.
 Minimum freight charged on a 88. B | L is on 20 cubic feet.

USEFUL INFORMATION

A VOIR DU POIS WEIGHT

Drachms.	1 oz.=137.5 grains troy.
16=	1 lb.=1.2153 lbs. troy.
256=	400= 25= 1 quarter.
25,000=	1,600= 100= 4= 1 cwt.
512,000=	32,000= 2,000= 90= 20= 1 ton.

TROY WEIGHT

Grains.	24= 1 dwt.
480=	20= 1 oz.
5,760=	240= 1 lb.=22.56 cub. inches of distilled water at 62° Fahr.

DRY MEASURE

Pints=	33.6 cubic inches.
2=	1 quart=67.2 cubic inches.
8=	4= 1 gallon=268.8 cubic inches.
16=	8= 2= 1 peck=537.6 cubic inches.
64=	32= 8= 4= 1 bushel.
Note.—The standard U. S. bushel is the Winchester bushel, which is in cylinder form, 18½ inches in diameter and 8 inches deep, and contains 2,150.42 cubic inches.	

SQUARE MEASURE

Inches.	144= 1 foot.
1,296=	9 = 1 yard.
39,204=	272.25= 1 perch.
1,568,160=	10,584 = 1.20 = 6= 1 rod.
6,272,640=	43,580 = 1.80 = 16= 1 acre.
An acre is 69,504 yards per square; or, 208.710321 feet square.	
A township is 36 miles square=36 sections.	
A section is 1 mile square=640 acres.	
A section is ¼ mile square=160 acres.	
A section is ⅙ mile square=40 acres.	

A span is the distance that can be reached between the end of the middle finger and the end of the thumb. Among sailors 8 spans are equal to 1 thumb.

A geographic mile is 1.21600 of the distance around the center of the earth.

A square mile of land is called a section.

A Gunter's chain, used by land surveyors, is 4 rods, or 66 feet long, and consists of 100 links. 7.92 inches make a link.

Canal and railroad engineers use an engineer's chain, which consists of 100 links, each 1 foot long.

PAPER MEASURE

Quire of paper	24 sheets.
Ream of paper	30 quires or 480 sheets.
Bundle	2 reams.
Bale	5 bundles.
Roll of parchment	60 skins.
Sheet of paper folded into—	
2 leaves	is termed folio size.
4 leaves	is termed 4to or quarto.
8 leaves	is termed 8vo. or octavo.
12 leaves	is termed 12mo. or duodecimo.
16 leaves	is termed 16mo.
18 leaves	is termed 18mo.
24 leaves	is termed 24mo.
48 leaves	is termed 48mo.

APOTHECARIES' WEIGHT

Grains.	20= 1 scruple or -
60=	3= 1 drachm or 3
480=	24= 8= 1 oz. or 3
5,760=	288= 96= 12= 1 lb.

APOTHECARIES' MEASURE

60 minims	= 1 fluid-drachm.
8 fluid-drachms	= 1 fluid-ounce.
16 fluid-ounces	= 1 pint.
8 pints	= 1 gallon.
Forty-five drops, or a common teaspoonful, make about 1 fluid-drachm; 2 tablespoonfuls, about 1 fluid-ounce; a wineglassful, about 1½ fluid-ounces; and a teacupful, about 4 fluid-ounces.	

LIQUID OR WINE MEASURE

Gills=	7.2187 cubic inches.
4=	1 pint=28.875 cubic inches.
8=	2= 1 quart=57.75 cubic inches.
32=	8= 4= 1 gallon.
2,016=	404= 252= 63= 1 hoghead.
4,032=	1,008= 504= 126= 2= 1 pipe.
8,064=	2,016= 1,008= 252= 4= 2= 1 ton.

Note.—The standard unit and liquid measure adopted by the U. S. government is the Winchester wine gallon, which contains 231 cubic inches, and holds 8.339 pounds, avoirdupois, of distilled water, at its maximum density weighed in air, the barometer being at 30 inches.

The imperial gallon, adopted by Great Britain, contains 277.274 cubic inches, and equals 1.2002 U. S. gallons.

The following cylinders contain some of these measures very closely:

Gill, diameter, 1½ inches; height, 3 inches.	
Pint, diameter, 2½ inches; height, 3 inches.	
Quart, diameter, 3½ inches; height, 6 inches.	
Gallon, diameter, 7 inches; height, 6 inches.	
8 gallon, diameter, 14 inches; height, 12 inches.	
10 gallon, diameter, 14 inches; height, 15 inches.	

WEIGHT OF WATER

1 cubic inch	= .03617 pounds.
12 cubic inches	= .434 pounds.
1 cubic foot	= 7.48052 U. S. gallons.
1 U. S. gallon	= 8.335 pounds.
1.8 cubic feet	= 2240 pounds.
2,240 pounds	= 268.8 U. S. gallons.

LIQUID WEIGHT

	Lbs. Avoirdupois.
1 gallon distilled water	10
1 gallon sea water	10.32
1 gallon proof spirits	9.08

OILS

	Lbs. Avoirdupois.
1 gallon sperm	7½
1 gallon whale	7½
1 gallon lard	7½
1 gallon tallow	7½
1 gallon neat's-foot	7½
1 gallon paraffine, 28° gravity	7½
1 gallon paraffine, 35° gravity	7½
1 gallon reduced Franklin	7½
1 gallon castor	8
1 gallon kerosene	6½

USEFUL INFORMATION

WEIGHTS AND MEASURES

SOLID MEASURES

	Cub. Cub.	Ins. Ft.
Cubic inch (subdivided decimally).....	1	..
1 foot x 1 inch x 1 inch.....	12	..
1 foot x 1 foot x 1 inch.....	144	..
Cubic foot (subdivided decimally or duodecimally)	1.728	1
Cubic yard	46,656	27
Load of hewn timber.....	50	50
Perch of masonry (= 16½ square yards face x 1½ feet thick.....)	24½	cubic feet
Cord of wood of earth is called a load.	128	cubic feet

In civil engineering, the cubic yard is the unit to which estimates are reduced.

A pile 8 feet long, 4 feet wide, 4 feet high, contains 1 cord, and a cord-foot is 1 foot in length of such a pile.

In measuring timber for shipment, one-fifth of the solid contents of round timber is deducted for waste in hewing or sawing.

TO COMPUTE WEIGHTS OF DIFFERENT MATERIALS

The compute the weight of cast metal by the weight of the pattern when the pattern is of white pine.

Multiply the weight of the pattern in pounds by the following multipliers, and the product will give the weight of the casting: Iron, 15; brass, 16; lead, 23.5; tin, 15; zinc, 14.

SHEETS

Steel.—Divide the thickness, expressed in thousandths, by 25. The result is the weight in pounds per square foot.

Brass.—Add 11 per cent to the weight of sheet steel.

Copper.—Add ten per cent to the weight of sheet steel.

BARS AND PLATES

Iron.—Multiply contents in cubic inches by 27777. Result will be weight in pounds.

Steel.—Multiply contents in cubic inches by 28332. Result will be weight in pounds.

Copper.—Multiply contents in cubic inches by 32118. Result will be weight in pounds.

Brass.—Multiply contents in cubic inches by 3112. Result will be weight in pounds.

Lead.—Multiply contents in cubic inches by 41015. Result will be weight in pounds.

Zinc.—Multiply contents in cubic inches by 25318. Result will be weight in pounds.

Tin.—Multiply contents in cubic inches by 25562. Result will be weight in pounds.

Aluminum.—Multiply contents in cubic inches by 99375. Result will be weight in pounds.

RULE FOR DETERMINING THE WEIGHT OF LIVE CATTLE BY MEASUREMENT

There are many rules for estimating the weight of cattle by measurement, but one of the authorities on the subject says that "There is no rule that comes nearer than good guessing, and that no two animals will weigh alike according to measurement." The same authority further remarks that a rule as good as any is to find the superficial feet by multiplying the girth, just behind the shoulder blade, by the length from the fore part of the shoulder blade to the root of the tail. Thus, an ox girthing 7 feet 9 inches and measuring 6 feet in length, would contain seven and three-fourths times six, or 46½ superficial feet. For cattle, grass-fed, the following is given as the weight per superficial foot:

Girth less than 3 feet	31 pounds.
Girth 3 to 5 feet	36 pounds.
Girth 5 to 7 feet	41 pounds.
Girth 7 to 9 feet	46 pounds.

Thus, the steer, as per above measurements, should weigh 4630 by 31, or 1,441 pounds, gross. Under this rule it is usual to deduct one pound in twenty on half-fatted cattle; from fifteen to twenty pounds on a cow having had calves, and if not fat an equal amount. The author of this rule suggests its use only when the scale is wanting, as the scale is the only true standard.

HOW TO WEIGH A HAY-STACK

Measure the length and breadth of the stack; take height from the ground to the eaves, add to this last one-half of the height from the eaves to the top; multiply the length by breadth, and the product by the height, all expressed in feet; divide the amount by 27, to find the cubic yards, which multiply by the number of pounds supposed to be in a cubic yard, viz.: in a stack of new hay, 132 pounds avoirdupois each; if old hay, 154 pounds each.

HOW TO MEASURE TIMBER AND LUMBER

To ascertain the number of cubic feet in round timber, find the average circumference by adding the circumference of the larger and smaller ends and dividing by 2; multiply the square of one-fourth of this average circumference by the length in feet; the result gives four-fifths of the real contents in cubic feet, one-fifth being customarily allowed to the purchaser for waste in sawing.

To measure contents of square timber, multiply the width by the thickness, in inches; this product by the length in feet, and divide by 12; result gives feet.

To measure boards, multiply length in feet by breadth in inches, and divide by 12 for inch boards; the quotient gives contents in feet. For boards 1½ inches thick, add one-quarter to quotient; if 1½, add one-half; if 2 inches, divide by 6 instead of 12; if 3 inches, divide by 4; if 4 inches, divide by 3; if 6 inches, divide by 2.

USEFUL INFORMATION

PROPORTIONS OF VARIOUS COMPOSITIONS IN COMMON USE

(In 100 Parts.)

Babbitt Metal.—Tin, 89; copper, 3.7; anti-
mony, 7.3.
Fine Yellow Brass.—Copper, 66; zinc, 34.
Gun Metal Valves, Etc.—Copper, 90; tin, 10.
White Brass.—Copper, 10; zinc, 89; tin, 10.
German Silver.—Copper, 33.3; zinc, 33.4;
nickel, 33.3.

Church Bells.—Copper, 30; zinc, 5.6; tin,
10.1; lead, 4.3.
Gongs.—Copper, 81.6; tin, 18.4.
Lathes Bushes.—Copper, 89; tin, 20.
Machinery Bearings.—Copper, 87.5; tin, 12.5.
Muntz Metal.—Copper, 60; zinc, 40.
Sheathing Metal.—Copper, 56; zinc, 44.

Alloys	Tin	Copper	Zinc	Anti- mony	Lead	Bis- muth
Brass, engine bearings	13	112	$\frac{1}{2}$			
Tough brass, engine work	15	100	$\frac{1}{2}$			
Tough brass, for heavy bearings	25	160	5			
Yellow brass, for turning		2	1			
Flanges to stand brazing		32	1		1	
Bell-metal	5	16				
Babbitt's metal	19	1		1		
Brass, locomotive bearings	7	64	1			
Brass, for straps and glands	16	130	1			
Muntz's sheathing		6	4			
Metal to expand in cooling				2	9	1
Pewter	100			17		
Spelter		1	1			
Statuary bronze	2	90	9		2	
Type-metal	from			1	3	
Type-metal	to			1	7	
Solders						
For lead	1				$1\frac{1}{2}$	
For tin	1				1	
For pewter	2					
For brazing (hardest)		3	1			
For brazing (hard)		1	1			
For brazing (soft)	1	4	3			
For brazing	2			1		

EFFECT OF HEAT ON VARIOUS SUBSTANCES

Antimony melts at	551°	Tin melts at	421°
Bismuth melts at	476	Zinc melts at	740
Brass melts at	1990	Ice melts at	32
Copper melts at	2548	Mercury boils at	682
Glass melts at	2377	Naphtha boils at	156
Gold melts at	2590	Fresh water boils at	212
Cast iron melts at	3479	Sea water boils at	213.2
Lead melts at	594	Ether boils at	100
Platinum melts at	3080	Oil turpentine boils at	304
Silver melts at	1250	Linseed oil boils at	640
Steel melts at	2500	Sweet oil boils at	412

SAFETY PLUGS. COMPOSITION
AND MELTING POINTSMELTING TEMPERATURE OF
ALLOYS

Lead 1, tin 0, bismuth 4, cadmium 1, melts at	153°
Lead 3, tin 5, bismuth 8, melts at	208
Lead 1, tin 3, bismuth 5, melts at	212
Lead 1, tin 4, bismuth 6, melts at	210
Tin 1, bismuth 1, melts at	286
Lead 2, tin 3, melts at	334
Tin 2, bismuth 1, melts at	336
Lead 1, tin 2, melts at	360
Tin 3, bismuth 1, melts at	362
Lead 2, tin 1, melts at	475

Tin	Lead	Melts °F	Tin	Lead	Bis- muth	Melts °F
6	1	381	4	4	1	320
5	1	378	3	3	1	310
4	1	365	2	2	1	292
3	1	340	1	1	1	254
2	1	324	1	1	1	212
$1\frac{1}{2}$	1	320	1	1	1	201
			0	3	1	190

Sphere or Ball.—To find cubic contents of:
Multiply the cube of the diameter by 5623.
To find the surface of a sphere: Multiply
the circumference by the diameter.

USEFUL INFORMATION

GLUE LEATHER TO IRON

Paint iron with white lead and lamp black; when dry cover with cement made as follows: Soak best glue in cold water till soft, then dissolve in vinegar with moderate heat; add one-third of its bulk of white pine turpentine; mix thoroughly, and reduce with vinegar to a proper consistency to spread with brush. Apply while hot. Draw leather on quickly and press tightly to place.

HOW TO CUT A BOTTLE

Fill with oil up to the line you wish to cut at. Make an iron rod white hot, and dip it into the oil.

CASE-HARDENING

Place horn, hoof, bone dust, or shreds of leather, together with the article to be case-hardened, in an iron box subject to a blood-red heat, then immerse the article in cold water.

CASE-HARDENING WITH PRUSSIAN-ATE OF POTASH

Heat the article after polishing to a bright red; rub the surface over with prussiate of potash; allow it to cool to dull red, and immerse it in water.

NUMBER OF POUNDS TO THE BUSHEL, LEGAL WEIGHT, IN THE DIFFERENT STATES

States	Wheat	Rye	Oats	Barley	Buckwheat	Shelled Corn	Corn on the Cob	Corn Meal	Potatoes	Sweet Potatoes	Onions	Turnips	Beans	Peas	Dried Apples	Dried Peaches	Flax Seed	Timothy Seed	Blue Grass Seed	Clover Seed	Anthrax Coal
Arkansas ..	60	56	32	48	52	56	70	50	60	50	57	60	46	24	33	56	45	14	60	80	
California ..	60	54	32	50	49	52	56	50	60	50	50	50	60	60	24	33	56	45	14	60	80
Connecticut ..	60	56	32	48	48	56	70	48	60	55	57	55	60	60	24	33	56	45	14	60	80
Georgia ..	60	56	32	47	52	56	70	48	60	55	57	55	60	60	24	33	56	45	14	60	80
Illinois ..	60	56	32	48	52	56	70	48	60	55	57	55	60	60	24	33	56	45	14	60	80
Indiana ..	60	56	32	48	50	56	68	50	60	55	57	55	60	60	24	33	56	45	14	60	80
Iowa ..	60	56	32	48	52	56	70	50	60	55	57	55	60	60	24	33	56	45	14	60	80
Kansas ..	60	56	32	48	50	56	70	50	60	55	57	55	60	60	24	33	56	45	14	60	80
Kentucky ..	60	56	32	47	55	55	70	50	60	55	57	55	60	60	24	33	56	45	14	60	80
Maine ..	60	56	32	48	48	56	70	50	60	56	52	50	64	60	24	33	56	45	14	60	80
Massachusetts ..	60	56	32	48	48	56	70	50	60	56	52	50	60	60	24	33	56	45	14	60	80
Michigan ..	60	56	32	48	48	56	70	50	60	56	54	58	60	60	24	33	56	45	14	60	80
Minnesota ..	60	56	32	48	42	56	70	50	60	56	54	58	60	60	24	33	56	45	14	60	80
Missouri ..	60	56	32	48	52	56	70	50	60	56	57	60	60	60	24	33	56	45	14	60	80
N. Hampshire ..	60	56	32	48	50	56	70	50	60	56	57	60	60	60	24	33	56	45	14	60	80
N. Jersey ..	60	56	32	48	50	56	70	50	60	56	57	60	60	60	24	33	56	45	14	60	80
N. York ..	60	56	32	48	48	56	70	50	60	56	57	60	60	60	24	33	56	45	14	60	80
N. Carolina ..	60	56	32	48	50	54	46	50	60	55	57	60	60	60	24	33	56	45	14	60	80
Ohio ..	60	56	32	48	50	56	70	50	60	55	57	60	60	60	24	33	56	45	14	60	80
Pennsylvania ..	60	56	32	47	48	56	70	50	60	55	57	60	60	60	24	33	56	45	14	60	80
Rhode Island ..	60	56	32	48	55	56	70	50	60	55	57	60	60	60	24	33	56	45	14	60	80
S. Carolina ..	60	56	32	48	55	56	70	50	60	55	57	60	60	60	24	33	56	45	14	60	80
Tennessee ..	60	56	32	48	50	56	72	50	60	56	56	60	60	60	24	33	56	45	14	60	80
Vermont ..	60	56	32	48	46	52	56	50	60	56	56	60	60	60	24	33	56	45	14	60	80
Virginia ..	60	56	32	48	52	56	70	50	60	56	57	55	60	60	24	33	56	45	14	60	80
Wisconsin ..	60	56	32	48	50	56	70	50	60	56	57	42	60	60	24	33	56	45	14	60	80

SIZES OF BOXES FOR DIFFERENT MEASURES

A box 24 inches long by 16 inches wide, and 28 inches deep, will contain a barrel, or three bushels.

A box 24 inches long by 16 inches wide, and 14 inches deep, will contain half a barrel.

A box 16 inches square and 8-25 inches deep will contain one bushel.

A box 16 inches by 8-25 inches wide, and 8 inches deep, will contain half a bushel.

A box 8 inches by 8-25 inches square, and 8 inches deep, will contain one peck.

A box 8 inches by 8 inches square, and 4-15 inches deep, will contain one gallon.

A box 4 inches by 4 inches square, and 4-15 inches deep, will contain half a gallon.

A box 4 feet long, 3 feet 5 inches wide, and 2 feet 8 inches deep, will contain one ton of coal.

NUMBER OF TREES ON AN ACRE

4 feet apart.....	2,739	10 feet apart.....	439	20 feet apart.....	110
5 feet apart.....	1,719	12 feet apart.....	325	22 feet apart.....	70
6 feet apart.....	1,200	15 feet apart.....	209	30 feet apart.....	60
8 feet apart.....	689	18 feet apart.....	135		

USEFUL INFORMATION

HOW TO FILE HAND SAWS

A subject of never-failing interest to the average worker in wood is the care of tools and how to sharpen them to the best advantage.

The first operation should be what is commonly called jointing. It is better to take a flat mill file and rub the teeth down until their length is uniform. For instance, in a straight-breasted saw, if you should put a straight edge along the teeth, every one should just touch it. Then comes the setting. Use, if you have one, a regular setting block, and care should be used in preparing said block not to have a sharp edge where the tooth bends down, as it is apt to cause breakage. A turning of the point is sufficient and far better for the saws. The teeth should be set alternately right and left. A highly tempered saw which will hold the edge best, must be carefully handled or you will lose many teeth in this operation. Do not put any more set than just enough to clear nicely. At this point it might be well to use the flat mill file, and do what is commonly called side filing the teeth. This is to guard against any uneven setting and will be appreciated in the finished saw.

Your saw is now ready to file, and you will find it advisable to select your files carefully. For a six and seven-point saw use a 7-inch slim taper. For eight and nine points use 6-inch slim taper, and for ten, eleven and twelve point use a 5-inch slim taper. After placing your saw securely in the vise, commence to file at the point and progress toward the butt or heel. Always file the teeth which are set away from you, and as to the amount of bevelling, it is entirely at the discretion of the carpenter. It is essential, however, that the bevel be placed on the front of the tooth. When through with one side, reverse the saw and proceed as before.

To prepare rip saws proceed as in hand saws, except always use 7-inch slim taper, and if the saw is intended to cut hard lumber a slight bevel is advisable, but if for ordinary and soft wood it is best to file straight across.

To insure a keen, sharp cutting edge to your saw, it is well to pass a hard oil stone lightly over the sides of the teeth to take off all burr or wire edge left in filing.

ITEMS OF INTEREST

Five courses of brick will lay one foot in height on a chimney, 8 bricks in a course will make a flue 4 inches wide and 12 inches long, and 16 bricks in a course will make a flue 8 inches wide and 16 inches long.

Cement 1 bushel and sand 2 bushels will cover $3\frac{1}{2}$ square yards 1 inch thick, $4\frac{1}{2}$ square yards $\frac{3}{4}$ inch thick, $6\frac{3}{4}$ square yards $\frac{1}{2}$ inch thick, 1 bushel cement and 1 of sand will cover $2\frac{1}{2}$ square yards 1 inch thick, 3 square yards $\frac{3}{4}$ inch thick, and $4\frac{1}{2}$ square yards $\frac{1}{2}$ inch thick. Twenty-two cubic feet of stone, when built into the wall, is 1 perch.

Fifty feet of boards will build one rod of fence five boards high, first board being 10 inches wide, second 8 inches, third 7 inches, fourth 6 inches, fifth 5 inches.

To find the diagonal of a square, multiply the side by 1.4142.

To find the circumference of a circle, multiply the diameter by 3.1416.

To find the area of a circle, multiply the square of the diameter by .7854.

To find the solid contents of a ball or globe, multiply the cube of the diameter by .5236.

To find the side of a square that has the same area as a given circle, multiply diameter by .8862.

To lay out an octagon when square is given, multiply the side of square by $3\frac{1}{2}$ and divide by 12, will give the gauge line from corner.

Allow 32 cubic feet a ton for the heaviest coal, and 36 for the lightest.

To find the area of an ellipse, multiply the product of the two diameters by .7854.

To find the side of an equilateral triangle that will inscribe in a given circle, multiply diameter by .8663.

To find side of octagon when square is given, multiply side of square by 5 and divide by 12, will give the length of one side of octagon.

To find the contents of a barrel or cask, multiply the square of mean diameter by the depth (all in inches), and multiply the product by .004.

A square in roofing is 10 feet square or 100 square feet.

To find side of square that will inscribe in a given circle, multiply diameter by .7071.

To find the capacity of a square tank or cistern, multiply the number of cubic feet by $7\frac{1}{2}$ (or 7.48) and the result will be in gallons.

To find contents of cistern or tank, multiply the square of the mean diameter by the depth (all in feet) and this product by $\frac{5}{8}$, the result will be in gallons.

To the square foot it takes 9 shingles if laid 4 inches to the weather; 8 if laid $4\frac{1}{2}$ inches, and 7-15 if laid 5 inches. Find the number of shingles required to cover a roof 38 feet long and the rafters on each side 14 feet, shingles laid $4\frac{1}{2}$ to the weather. $38 \times 28 = 1064$ square feet $\times 8 = 8512$ shingles.—Ans.

One bundle of lath will lay from $3\frac{1}{2}$ to 4 yards.

A shingle is 4 inches wide, the length not taken in consideration.

Shingles are baled 20 inches wide, which makes 5 shingles in width.

Shingles will last much longer on lath or open sheathing than on tight sheathing.

To measure square timbers, multiply the length, width and thickness together, and divide the product by 12.

1,000 shingles laid 4 inches to the weather, will cover 100 square feet of surface, and 5 pounds of shingle nails will fasten them on.

1,000 laths will cover 70 yards of surface and 7 pounds of lath nails will nail them on. Eight bushels of good lime, 16 bushels of sand, and 1 bushel of hair will make enough good mortar to plaster 300 square yards.

One-fifth more siding and flooring is needed than the number of square feet of surface to be covered, because of the lap in the siding and matching.

Three pecks of lime and 4 bushels of sand are required to each perch of wall.

A cord of stone, 3 bushels of lime, and a cubic yard of sand, will lay 100 cubic feet of wall. There are 20 common bricks to a cubic foot when laid; and 15 common bricks to a foot of 8-inch wall when laid.

USEFUL INFORMATION

SIMPLE INTEREST RULES

Four Per Cent.—Multiply the principal by the number of days to run; cut off the right-hand figure and divide by 9.

Five Per Cent.—Multiply by number of days and divide by 72.

Six Per Cent.—Multiply by number of days; cut off right-hand figure and divide by 6.

Seven Per Cent.—Compute the interest for 6 per cent and add one-sixth.

Eight Per Cent.—Multiply by number of days and divide by 45.

Nine Per Cent.—Multiply by number of days; cut off the right-hand figure and divide by 4.

Ten Per Cent.—Multiply by number of days and divide by 35.

TO REMOVE RUST FROM STEEL

Steel which has been rusted can be cleaned by brushing with a paste compound of $\frac{1}{2}$ ounce cyanide potassium, $\frac{1}{2}$ ounce castile soap, 1 ounce whiting, and water sufficient to form a paste. The steel should be washed with a solution of $\frac{1}{2}$ ounce cyanide potassium in 2 ounces water.

TO PRESERVE STEEL FROM RUST

One caoutchouc, 15 turpentine. Dissolve with a gentle heat, then add 8 parts boiled oil. Mix by bringing them to the heat of boiling water; apply to the steel with a brush, in the way of varnish. It may be removed with turpentine.

TO CLEAN BRASS

One Roche alum and 15 water. Mix. The articles to be cleaned must be made warm, then rubbed with the above mixture, and finished with fine tripoli.

TO BRIGHTEN TARNISHED BRASS OR COPPER

Clean the brass by warming it and dipping it in water charged with washing soda; then into clear water to remove grease; next, dip for a moment into a bath made of 1 part sulphuric acid, 1 part sal ammoniac, 2 parts nitric acid, 4 parts water; then dip in clear water and dry in hot sawdust.

TO PRESERVE WIRE ROPE

To preserve wire rope from wear or exposure, cover it thickly with linseed oil or with paint formed of equal parts linseed oil and Spanish brown or lampblack. If used under water or under ground, the best preservative is made by adding to one barrel of tar one bushel of fresh slacked lime, boil well and while hot saturate the rope. Sawdust or oatmeal is sometimes added with good effect.

TO SOLDER WITHOUT HEAT

Brass filings, 2 ounces; steel filings, 2 ounces; fluoric acid, $\frac{1}{4}$ ounce. Put the filings in the acid and apply the solution to the parts to be soldered, after thoroughly cleaning the parts in contact, then dress together. Do not keep the fluoric acid in glass bottles, but in lead or earthen vessels.

TO SOFTEN STEEL

Cover it with clay, heat to a cherry red in a charcoal fire, and let cool over night in the fire.

TO SHARPEN REAMERS

Use a stone on face and top of cutting edge, taking care to keep stone perfectly flat.

TO SHARPEN DULL FILES

Immerse them in diluted sulphuric acid until cuts are sufficiently deepened.

TO PREVENT BOILERS FROM SCALING

A piece of oak or zinc suspended in the boiler, or potatoes—a peck or more—boiled therein, will prevent a deposit of scale.

AIR AND STEAM-TIGHT RUBBER PACKING

Brush the packing over with a solution of powdered resin in ten times its weight of stronger water of ammonia. This mixture is at first a sticky mass, but becomes fit for use in about three or four weeks. It easily adheres to rubber, as well as to wood or metal, and becomes perfectly impervious to liquids.

CEMENT FOR JOINTS

Paris white, ground, 4 lbs.; litharge, ground, 10 lbs.; yellow ochre, fine half pound; half ounce of hemp, cut short. Mix well together with linseed oil to a stiff putty. This cement is good for joints on steam or water pipes; it will set under water.

Iron or steel immersed warm in a solution of washing soda for a few minutes prevents rust.

One of the best varnishes for smoke stacks or steam pipes is good asphaltum dissolved in oil of turpentine.

Oxalic acid dissolved in soft water, say $\frac{1}{2}$ an ounce to a pint, is one of the best known means for cleaning and brightening brass work.

TO TEMPER STEEL VERY HARD

Water, 4 parts; flour, 1 part; salt, 2 parts; mixed to a paste. Heat the steel until a coating adheres when dipped into the mixture; then heat to a cherry red and cool in cold soft water. The steel will come out white and very hard.

USEFUL INFORMATION

TO TEMPER STEEL ON ONE EDGE ONLY

Dip the edge to be tempered into hot lead until proper color; then temper in ordinary fashion.

TO DRILL HARDENED STEEL

Cover your steel with melted beeswax; when coated and cold, make a hole in the wax with a fine-pointed needle or other article the size of hole you require, put a drop of strong nitric acid upon it; after an hour rinse off and apply again; it will gradually eat through.

A mixture of 1 ounce of sulphate of copper, $\frac{1}{4}$ ounce of alum; $\frac{1}{2}$ teaspoonful of powdered salt, 1 gill of vinegar and 20 drops of nitric acid will make a hole in steel that is too hard to cut or file easily.

A small hole drilled at the end of crack in sheet steel will stop it from growing longer.

ANNEALING STEEL

For small pieces of steel, take a piece of gas pipe, 2 or 3 inches in diameter, and put the pieces in it, first heating one end of the pipe, and drawing it together, leaving the other end open to look into. When the pieces are of cherry red, cover the fire with sawdust, use a charcoal fire, and leave the steel in over night.

IN TURNING STEEL OR OTHER HARD METAL

Use a drip composed of petroleum two parts and turpentine one part. This will insure easy cutting and perfect tools when otherwise the work would stop, owing to the breakage of tools from the severe strain.

TEMPERING RECIPES

Resin, 2 pounds; tallow, 2 pounds; pitch, 1 pound. Melt together and dip the hot steel in it.

Salt, $\frac{1}{2}$ cupful; saltpetre, $\frac{1}{4}$ ounce; alum, pulverized, 1 teaspoonful; soft water, 9 gallons. Never heat above a cherry red nor draw any temper.

By melting together 1 gallon spermaceti oil; 2 pounds tallow and $\frac{1}{4}$ pound wax, a mixture is obtained very convenient for tempering any kind of steel article of small size. Adding 1 pound resin makes it suitable for larger articles.

TO HARDEN GRAVERS

Heat in charcoal dust (not too hot), and plunge into a box of wet, yellow soap. This renders the end of the graver very hard and very tough.

Strong sal soda water or soapy water is much better than clean water to use where water cuts are being taken, either on lathe or planer. When cutting brass, sweet milk is recommended as being better than either the foregoing.

PERMANENT WHITEWASH

Slack $\frac{1}{2}$ bushel unslacked lime with boiling water, keeping it covered during process; strain it, and add a peck of salt dissolved in warm water, 3 pounds ground rice, boiled in hot water to a thin paste, $\frac{1}{2}$ pound powdered Spanish whiting, and a pound of clear glue, dissolved in warm water; mix well together and let stand for a few days. When used, put it on as hot as possible.

CURE FOR BURNS

Slack a lump of quicklime in water, and as soon as the water is clear, mix with linseed oil and shake well; this will form a thick, creamy substance. Bottled, it will keep for months.

MIXTURE FOR WELDING STEEL

1 sal-ammoniac.

1 borax.

Pounded together and fused until clear, when it is poured out, and, after cooling, reduced to powder.

RUST JOINT CEMENT, QUICKLY SETTING

1 sal-ammoniac in powder, by weight.

2 flour sulphur.

80 iron borings made to a paste with water.

RUST JOINT, SLOWLY SETTING

2 sal-ammoniac.

1 flour of sulphur.

200 iron borings.

The latter cement is the best if the joint is not required for immediate use.

RED LEAD CEMENT FOR FACE JOINTS

1 of white lead.

1 of red lead, mixed with linseed oil to the proper consistency.

CASE-HARDENING MIXTURE

3 prussiate of potash.

1 sal-ammoniac.

or,

1 prussiate of potash.

2 sal-ammoniac.

2 bone dust.

GLUE TO RESIST MOISTURE

1 pound of glue melted in 2 quarts of skim milk.

MARINE GLUE

1 of India rubber, 12 of mineral naphtha or coal tar. Heat gently, mix, and add 20 of powdered shellac. Pour out on a slab to cool. When used, to be heated to about 250°.

GLUE CEMENT TO RESIST MOISTURE

1 glue. } Mixed with least possible
1 black resin. } quantity of water.
1 red ochre. }

or,
4 of glue, or 1 oxide of iron.
1 of boiled oil (by weight).

USEFUL INFORMATION

BREAKING STRENGTH OF AND POWER TRANSMITTED BY WIRE
ROPES (42 WIRE)

Diameter of Ropes, Inches	Diameter of Pulleys, Feet	Revolutions per Minute	Breaking Stress of Rope per Pound	Horse-power Transmitted	Velocity of Rope in Feet per Second
7-16	5	100	4,390	8.6	26
15-32	6	100	5,060	13.4	31
1-3	7	100	8,200	21.1	36
5-8	8	100	11,600	27.5	42
5-8	8	120	11,600	33.0	50
5-8	9	100	11,600	51.9	47
5-8	9	120	11,600	62.2	56
11-16	10	100	15,200	73.0	52
11-16	10	120	15,200	87.6	62
11-16	10	140	15,200	102.2	73
11-16	12	100	15,200	116.7	63
3-4	12	120	17,600	148.9	75
3-4	12	140	17,600	173.7	87
3-4	14	100	17,600	185.0	73
3-4	14	120	17,600	222.0	87
3-4	15	120	17,600	300.0	94

CEMENT FOR LEATHER BELTING

Take equal parts of common glue and American isinglass. Place in a kettle and add sufficient water to cover. Soak for 10 hours, then bring the mixture to the boiling point, and add pure tannin until the whole becomes ropy or appears like the white of an egg. Apply it warm. Buff the grain from the leather where it is to be cemented, apply the cement and rub the joint until tight together, then let it dry for 5 or 6 hours.

LIQUID METAL POLISH

This makes a good polish for cold, smooth surfaces, either iron or brass.

To 3 quarts of benzine add 2 ounces of oxalic acid and $1\frac{1}{2}$ pounds of silicate powder. Keep in bottle tightly corked and shake well before using.

PASTE METAL POLISH

The following list of ingredients will make 20 pounds of the polish:

- 4 pounds of cake tallow,
- 2 ounces of spermaceti,
- 10 Star candles,
- $2\frac{1}{2}$ pints of raw linseed oil,
- $2\frac{1}{2}$ pints of kerosene,
- 5 pounds of tripoli powder.

Procure a crock capable of holding 3 or 4 gallons. Put in the tallow, spermaceti and candles, and melt over a slow fire. Then add the linseed oil and kerosene, and stir well. While this mixture is still warm, remove from the fire and add the tripoli powder very slowly, continually stirring the mixture. When all of the tripoli powder has been added, allow to cool.

Apply with a soft cloth, and after drying it can be removed by going over the polished surfaces with a dry cloth. This polish is good for any smooth surface, either hot or cold.

USEFUL INFORMATION

DIFFERENT COLORS OF IRON, CAUSED BY HEAT (POUILLET)

Deg. Ceb.	Deg. Fabr.	
261	502	Violet, purple, and dull blue, between 261 C. to 370 C. It passes to bright blue, sea green, and then disappears.
370	680	
500	932	Commences to be covered with a light coating of oxide; becomes a deal more impressive to the hammer and can be twisted with ease.
525	977	
700	1292	Becomes nascent red or just glowing in the dark.
800	1472	Nascent cherry.
900	1657	Cherry red.
1000	1832	Bright cherry red.
1100	2012	Dull orange.
1200	2192	Bright orange.
1300	2372	White.
1400	2552	Brilliant white welding heat.
1500	2732	Dazzling white.
1600	2912	

Light iron indicates impurity.

The heaviest steel contains least carbon.

Expanding and Contracting of Iron: All cast iron expands at the moment of becoming solid, and contracts in cooling; gray iron expands more and contracts less than other iron.

TEMPERING STEEL

Color.	Purpose.	Tem. Fabr.	Alloys whose fusing point is same temperature.
Light straw	Turning tools for metal	430	1 tin to 13 $\frac{1}{2}$ lead
Dark straw	Wood tools, taps and dies	470	1 tin to 2 $\frac{1}{2}$ lead
Brown yellow	Hatchets, chipping chisels	500	1 tin to 4 $\frac{1}{2}$ lead
Dark purple	Springs, etc.	650	1 tin to 12 lead

AVERAGE TEMPERATURES UNDER DIFFERENT CONDITIONS

	BESSEMER PROCESS	Centigrade	Fahrenheit
		Degrees	Degrees
Running the slag		1580	2876
Running steel into ladle		1640	2984
Running steel into mold		1580	2876
Annealing furnace, ingot in		1200	2192
Ingot under hammer		1090	1976
OPEN HEARTH PROCESS			
Gas from producers		720	1328
Gas entering generator		400	752
Gas leaving generator		1200	2192
Air leaving generator		1000	1832
Fumes passing to shaft		300	572
End of fusion of charge		1420	2588
Refining the steel		1500	2732
Running into ladle, first		1580	2876
Running into ladle, last		1490	2714
BLAST FURNACE—GRAY BESSEMER			
Front of tuyere		1930	3506
At tapping		1570	2858

STRENGTH OF IRON

The mean strength of American wrought iron is 45,900 lbs.; English 43,900. Ultimate extension of iron is 60th part of its length. The working strain is from 1-6 to $\frac{1}{4}$ the mean strength.

Resistance to flexure actions evenly over the surface, equals $\frac{1}{3}$ the tensile strength. Bars of wrought iron will expand or contract 151200th of their length for each degree of heat. With range of temperature of this country (minus 20 plus 130°)=150°, will expand or contract 1090th part of its length, equal to the force of 20740 lbs., or 9 $\frac{1}{4}$ ton per square inch section. Tensile strength increases, in from 1 to 6 reheatings and rollings from 43904 lbs., to 60824 lbs., and in from 6 to 12, is reduced again to 43904.

USEFUL INFORMATION

VALUABLE PRACTICAL RECEIPTS AND COMPOSITIONS

Plumber's Solder.—Tin, 2 pounds; lead, 5 pounds.

Hard Solder.—Copper, 1 pound; zinc, 8 ounces.

Yellow Solder.—Copper and zinc, equal parts.

Yellow Brass.—Zinc, 10 pounds; lead, 4 ounces; copper, 24 pounds.

Bronze Metal.—Antimony, 1 pound; tin, 100 pounds; copper, 2 pounds.

Silver Colored Metal.—Tin, 50 pounds; bismuth, 1 pound; antimony, 3 pounds; copper, 3 pounds.

Imitation Silver.—Copper, 4 pounds; zinc, 4 ounces.

White Metal.—Copper, 5 pounds; zinc, 3 pounds; lead, 1 pound; tin, 1 pound.

Metal for Taking Impressions.—Bismuth, 3 pounds; lead, 1 pound; tin, 3 ounces.

Rivet Metal.—Tin, 5 pounds; zinc, 2 pounds; copper, 10 pounds.

Tinning Acid for Brass or Copper.—Muriatic acid, 1 pound; give it all the zinc it will dissolve; add 4 ounces of sal-ammoniac, 1 pint water.

For Tinning Brass.—Water, 4 gallons; salt, 1 pint; cream tartar, 1 pound.

Mixture for Silvering Metals.—Dissolve 2 ounces of silver in 3 grains of corrosive sublimate, add salt, 8 quarts; tartaric acid, 4 pounds.

To separate *Silver* from *Copper*.—Sulphuric acid, one part; nitric acid, one part; water, one part; then boil the metal in the mixture until it dissolves; add a little salt and the silver will subside.

Common Pewter.—Tin, 4 pounds; lead, 1 pound.

Queca's Metal.—Tin, 9 pounds; antimony, 1 pound; lead, 1 pound; bismuth, 1 pound.

Mock Platinum.—Copper, 4 pounds; zinc, 18 pounds.

Type Metal.—Lead, nine parts; antimony, two parts; bismuth, two parts.

Cement for Stopping Holes in Cast Iron.—National Iron Filler Cement mixed with water until it is about the consistency of common paste, then it is ready for use. It should be kept in a dry place.

SAFE PRESSURE ON BEARINGS AND SLIDES

Kind of Journal Bearing.	Pressure per Sq. In. of Projected Area Pounds.
Bearings on which the load is intermittent and the speed slow, such as crank-pins of shearing machines	3,000
Cross-head neck journals	1,300
Crank-pins of large, slow speed engines	800-900
Crank-pins of marine engines, usually	400-500
Main crank-shaft bearings—marine engines (slow)	600
Main crank-shaft bearings—marine engines (fast)	400
Locomotive driving-axle journal	180-250
Railway journals	200
Fly-wheel shaft journals	150-250
Small engine crank pins	150-200
Slipper slide blocks, marine engines	100
Stationary engine slide blocks	25-125
Stationary engine slide blocks, usually	30-60
Propeller thrust bearings	50-70
Shaft in cast-iron steps or seats	15

USEFUL INFORMATION
TABLE GIVING THE PRESSURE IN POUNDS DUE
TO ANY CERTAIN HEIGHT OF A
COLUMN OF WATER

Head in Feet	Pressure in Pounds per Square Inch	Head in Feet	Pressure in Pounds per Square Inch	Head in Feet	Pressure in Pounds per Square Inch	Head in Feet	Pressure in Pounds per Square Inch
1	.43	20	8.66	55	23.83	90	38.90
2	.88	25	10.83	60	25.90	95	41.07
3	1.30	30	12.	65	28.06	130	43.33
4	1.74	35	15.16	70	30.55	125	54.17
5	2.16	40	17.33	75	32.72	150	65.
10	4.33	45	19.50	80	34.66	175	76.05
15	6.50	50	21.66	85	36.83	200	86.67

1	lb. pressure per square inch is equivalent to a head of water	2.3093 feet.
1	lb. " " " " " " " " " "	27.71 inches.
14.7	lbs. or 1 atmosphere inch " " " " " " " "	33.947 feet.
14.7	lbs. " " " " " " " " " "	10.347 metres.
0.433	lbs. " " " " " " " " " "	1 foot.
43.3	lbs. " " " " " " " " " "	100 feet.

TABLE SHOWING REFRIGERATING EFFECT OF
ONE CUBIC FOOT OF AMMONIA GAS AT
DIFFERENT CONDENSER AND SUC-
TION (BACK) PRESSURES IN
B. T. UNITS

Temperature of Gas in Degrees F.	Corresponding Suction Pressure, Lbs. per sq. in.	Temperature of the Liquid in Degrees F.								
		65°	70°	75°	80°	85°	90°	95°	100°	105°
		Corresponding Condenser Pressure (gauge), lbs. per sq. in.								
		103	115	127	139	153	168	184	200	218
—27°	G. Pres. 1	27.30	27.01	26.73	26.44	26.16	25.87	25.59	25.30	25.02
—20°	4	33.74	33.40	33.04	32.70	32.34	31.99	31.64	31.30	30.94
—15°	6	36.36	36.48	36.10	35.72	35.34	34.96	34.58	34.20	33.82
—10°	9	42.28	41.84	41.41	40.97	40.54	40.10	39.67	39.23	38.80
— 5°	13	48.31	47.81	47.32	46.82	46.33	45.83	45.34	44.84	44.35
0°	16	54.88	54.32	53.76	53.20	52.64	52.08	51.52	50.96	50.40
5°	20	61.50	60.87	60.25	59.62	59.00	58.37	57.75	57.12	56.50
10°	24	68.66	67.97	67.27	66.58	65.88	65.19	64.49	63.80	63.10
15°	28	75.88	75.12	74.35	73.59	72.82	72.06	71.29	70.53	69.76
20°	33	85.15	84.30	83.44	82.59	81.73	80.88	80.02	79.17	78.31
25°	39	95.50	94.54	93.59	92.63	91.68	90.72	89.77	88.81	87.86
30°	45	106.21	105.15	104.09	103.03	101.97	100.91	99.85	98.79	97.73
35°	51	115.69	114.54	113.39	112.24	111.09	109.94	108.79	107.64	106.49

TABLE OF CHLORIDE OF CALCIUM SOLUTION

Specific Gravity at 64° F.	Degree Beaumè at 64° F.	Degree Salometer at 64° F.	Per Cent of CaCl ₂	Freezing Point in Degrees F.	Ammonia Gauge Pressure, Pounds per Square Inch
1.007	1	4	0.943	+31.20	46
1.014	2	8	1.886	+30.40	45
1.021	3	12	2.829	+29.60	44
1.028	4	16	3.772	+28.80	43
1.035	5	20	4.715	+28.00	42
1.043	6	24	5.658	+26.89	41
1.050	7	28	6.601	+25.78	40
1.058	8	32	7.544	+24.67	38
1.065	9	36	8.487	+23.56	37
1.073	10	40	9.430	+22.09	35.5
1.081	11	44	10.373	+20.62	34
1.089	12	48	11.316	+19.14	32.5
1.097	13	52	12.259	+17.67	30.5
1.105	14	56	13.202	+15.75	29
1.114	15	60	14.145	+13.82	27
1.112	16	64	15.088	+11.89	25
1.131	17	68	16.031	+ 9.96	23.5
1.140	18	72	16.974	+ 7.68	21.5
1.149	19	76	17.917	+ 5.40	20
1.158	20	80	18.860	+ 3.12	18
1.167	21	84	19.803	— 0.84	15
1.176	22	88	20.746	— 4.44	12.5
1.186	23	92	21.689	— 8.03	10.5
1.196	24	96	22.632	—11.63	8
1.205	25	100	23.575	—15.23	6
1.215	26	104	24.518	—19.56	4
1.225	27	108	25.461	—24.43	1.5
1.236	28	112	26.404	—29.29	1" vacuum
1.246	29	116	27.347	—35.30	5"
1.257	30	120	28.290	—41.32	8.5"
1.268	31	....	29.233	—47.66	12"
1.279	32	....	30.176	—54.00	15"
1.290	33	....	31.119	—44.32	10"
1.302	34	....	32.062	—34.66	4"
1.313	35	....	33.	—25.00	1.5 pounds

TABLE OF BRINE SOLUTION
(CHLORIDE OF SODIUM—COMMON SALTS)

Percentage of Salt by Weight.	Degrees on Salometer at 60° F.	Specific Gravity of 60° F.	Specific Heat	Weight of One Gallon	Pounds of Salt in One Gallon	Pounds of Water in One Gallon	Weight of One Cubic Foot	Pounds of Salt in One Cubic Foot	Pounds of Water in One Cubic Foot	Freezing Point, Degrees F.
0	0	1.	1.	8.35	0.	8.35	62.4	0.	62.4	32.
1	4	1.007	0.992	8.4	0.084	8.316	62.8	0.628	62.172	31.8
5	20	1.037	0.96	8.65	0.432	8.218	64.7	3.237	61.465	25.4
10	40	1.073	0.892	8.95	0.895	8.055	66.95	6.695	60.253	18.6
15	60	1.115	0.855	9.3	1.395	7.905	69.57	10.435	59.134	12.2
20	80	1.150	0.829	9.6	1.92	7.68	71.76	14.352	57.408	6.86
25	100	1.191	0.783	9.94	2.485	7.455	74.26	18.565	55.695	1.00

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